

THE BAIRD
INSTITUTE
Applied heart & lung surgical research

heart TO HEART

MAY 2025

THE AUSTRALIAN Scientists tackling stiff heart syndrome

Tuesday 10 December 2024.

EXCLUSIVE

PENNY TIMMS

SENIOR HEALTH REPORTER

Watching Sydney man Aaran Creece easily stroll down several flights of stairs, you wouldn't know he had heart surgery just 10 weeks ago.

"It's weird to think that someone's been mucking around with your heart but it's a good feeling. I feel good," he said.

The freelance camera opera

tor and father of one first noticed something amiss about eight years ago when he felt his heartbeat strangely while resting.

"Quite specifically, it was my heart doing an extra big beat," he said. "This was literally out of the ordinary, just a boom, that big extra beat. It happened once and I didn't think anything of it, but it

began to happen on a more regular basis, and I thought I needed to go and see a doctor because that shouldn't be happening, in my opinion."

His cardiologist identified he had Stiff Heart Failure and began treating a leaky valve. Mr. Creece was prescribed medication to help manage his heartbeat and its surrounding muscles. He also decided it was a good time to increase his exercise and pay closer attention to what he ate.

Stiff Heart Failure is estimated to affect some 10 per cent of people aged over 45. It occurs when amyloid deposits take the place of the heart muscle. While not a lot is known about why that happens, it results in the heart muscle not being able to relax properly and can lead to potentially fatal complications. Once diagnosed, the condition has a five-year mortality rate of 75 percent, though a patient's outcome can depend on treatment.

Ten weeks ago, Mr. Creece underwent successful aortic root replacement surgery at Royal Prince Alfred Hospital in Sydney. His surgeon, Paul Bannon, also happened to be working on a world first proof-of-concept therapy for Stiff Heart Failure and Mr. Creece agreed to take part.

In the lead-up to his surgery, Mr. Creece began taking oral supplements of the vitamin B complex each morning and night.



Sean Lal, patient Aaran Creece and Paul Bannon

Prior studies have pointed to a potential link between low levels of a molecule called nicotinamide adenine dinucleotide and Stiff Heart Failure.

Scientists want to see if that molecule can be replenished if a patient takes the supplements.

"First of all, we want to see if we can get that supplement into the heart muscle and see if we get an improvement in the so-called Stiff Heart Syndrome," said Professor Bannon, the head of cardiothoracic research at RPA Hospital and chair of surgery at Sydney University. He is also Chair of The Baird Institute.

"Currently, we have these programs where we get the body and the lungs and the muscles in better shape prior to major surgery, but this is actually pre-habilitating the heart muscle before we go into the operation and then testing that to see if we've been effective. It's quite an elegant study."

The trial is a joint partnership between RPA Hospital, University of Sydney and The Baird Institute - Australia's only dedicated cardiothoracic surgical training and research facility which sits within the university's Charles Perkins Centre.

Sean Lal is an associate professor of medicine with the University of Sydney and a consultant cardiologist at Royal Prince Alfred Hospital who is also working on the trial.

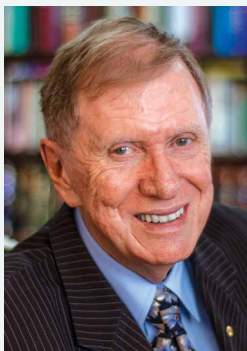
"What would be extremely

novel is if we show that in the group who's randomised, it is actually being taken up in the heart, compared to the group who was not randomised," he said.

"If you show that, the next stage is a large-scale international trial to then look at the beneficial effects of it."

Researchers anticipate that the initial trial will take around two years to complete. As for Mr. Creece, he said he was feeling good and had been given a clean bill of health post-surgery.

"I feel pretty good. If I hadn't listened to my body, if I hadn't listened to the healthcare professionals around me, it could have had long-term negative impacts on my life, and I quite like my life. So, yeah, I feel good."



A NOTE FROM OUR PATRON

**The Hon. Michael Kirby
ACCMG**

As Patron of The Baird Institute, I continue to be inspired by the courage of patients, the brilliance of our researchers, and the unwavering generosity of our supporters. I am also struck by the extraordinary way science and humanity come together at the Baird Institute to change lives.

In this edition, you will read the remarkable story of Aaran Creece, a man whose heart, quite literally, is at the centre of groundbreaking research into Stiff Heart Syndrome. His journey from uncertainty to recovery, exemplifies not only the excellence in surgical innovation but the profound human impact of what we do at The Baird Institute. That Aaran could take part in a world-first clinical trial while receiving lifesaving care is a testament to the excellence and vision of the Institute's researchers and clinicians and the work of the cooperating hospitals and clinical teams.

Our researchers are not content with the status quo. Whether it is uncovering the heart's ability to generate its own "rescue fuel," or developing degradable arterial grafts to replace synthetic ones, the pursuit of better outcomes for patients is relentless. Their work is not just scientific; it is humane. It recognises the person behind the medical condition, the family behind the patient, the future behind every breakthrough.

What makes this possible is you - our community of supporters. The Institute receives no government funding. Every step forward is built on the foundation of community support, scientific excellence, and a shared commitment to making the future better for those living with heart and lung disease.

Let's continue to dream big. Let us support the next breakthrough, the next life saved, the next generation of researchers. With your help, The Baird Institute remains a beacon of hope and healing for so many.

With appreciation and encouragement,

Patron, The Baird Institute



FROM THE CEO'S DESK

Every story in this newsletter reminds me why The Baird Institute exists and how lucky we are to have such a committed and caring community behind us.

*What really stands out to me this time is how many of our stories come back to one simple idea: **Connection**. Whether it's the connection between doctors and patients, researchers and clinicians, or supporters and the work we do, The Baird Institute is built on people coming together to make a difference.*

Take Aaran Creece, for example. His story is powerful, not just because of the surgery he had but because he trusted a team of professionals with his life, and in return, he became part of research that could help countless others in the future. It was especially meaningful to see his journey, and the groundbreaking trial he participated in, featured in The Australian newspaper last December. National recognition like this reaffirms the importance of what we're doing and shines a spotlight on the incredible work being done by our researchers and clinicians.

Or look at Wade Bocking, one of our scholarship recipients. His PhD work is aiming to transform vascular surgery - replacing rigid, synthetic materials with grafts that actually regrow natural blood vessels. That's future-focused, game-changing stuff. And it's happening because people like you believe in backing bold ideas and bright minds.

Then there's the quieter, but no less important, work happening in data research. Our project linking surgical outcomes to long-term health records is giving us a clearer picture of what truly helps patients thrive years after surgery. This knowledge is already shaping how we plan, treat, and follow up, and it will keep guiding us into the future.

These are the less flashy but equally vital parts of what we do: tracking success, measuring what matters, and making sure that everything we learn gets passed forward.

I'm also thrilled to welcome Lisa Turner to the team as our new Engagement Manager. Lisa has been connected to The Baird Institute for many years, and her passion for improving patient care is contagious. I know she's looking forward to meeting many of you and continuing to grow this incredible community.

If you've ever donated, shared our work, or just taken an interest - thank you. Everything we achieve, we do together.

With gratitude,

Catherine Rush
CEO, The Baird Institute



Aaran's Story

Late one July night in 2017, I crawled into bed, and as my body relaxed, I felt a thump from the inside of my chest. It was my heart, of course. Over the next two weeks, I noticed this irregular thump more frequently. Initially, I thought it was due to my coffee intake. As a freelance camera operator, I often had to wake up early and work long days, requiring extra caffeine to get going. I wondered, 'Should my heart take such a big beat, and more importantly, is this normal?' I wasn't one to hesitate consulting my GP, who immediately suspected something was wrong.

I spent 24 hours wearing a Holter monitor and underwent an echocardiogram.

I was promptly referred to cardiologist Prof. Michelle McGrady at Central Sydney Cardiology. To my surprise, I discovered I had a leaky aortic valve. This meant the valve wasn't closing properly, allowing blood to flow back into my heart.

Surgery was inevitable; it wasn't a matter of if, but when.

Fast forward to May 2024, during a routine check-up with Prof. McGrady, I learned that the size of the dilation had worsened. There was more regurgitation, and my heart was working harder to expel the excess blood.

To clarify, apart from the irregular heartbeat, I had no other symptoms. Prof. McGrady referred me to surgeon Prof. Paul Bannon. In contrast to anyone I've ever met, Prof. Bannon made me feel completely at ease about having heart surgery. In fact, I was eager to undergo the surgery and resolve this issue.

Through this introduction, I discovered The Baird Institute. I was asked to participate in a trial investigating stiff heart syndrome. This meant taking a supplement or placebo in the month leading up to surgery and undergoing a biopsy during surgery while my valve was being replaced. The research conducted by the Baird Institute is truly remarkable, and I was honoured to be a part of it.

Those initial days in the Intensive Care Unit were both mentally and



Aaran at RPA Hospital post surgery

physically demanding, and few things can adequately prepare you for such a challenging experience. However, thanks to the exceptional skills and dedication of Prof. Bannon's team and the brilliant staff on the Cardiovascular Ward, I was discharged and back home within five days of my surgery.

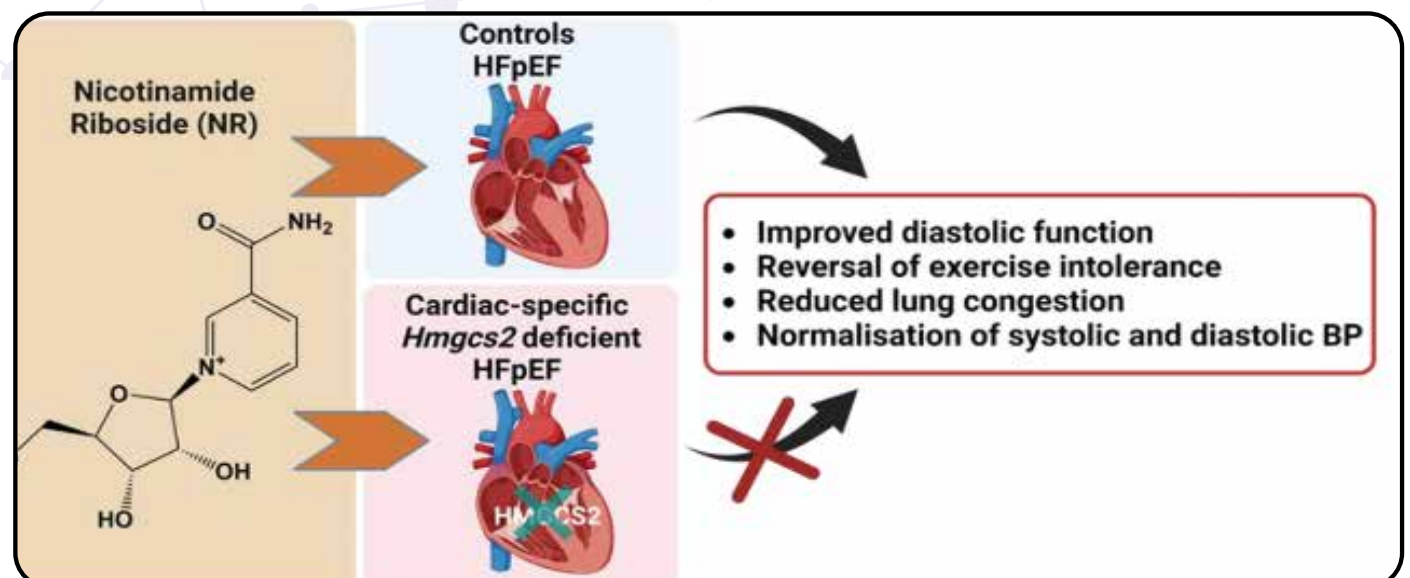
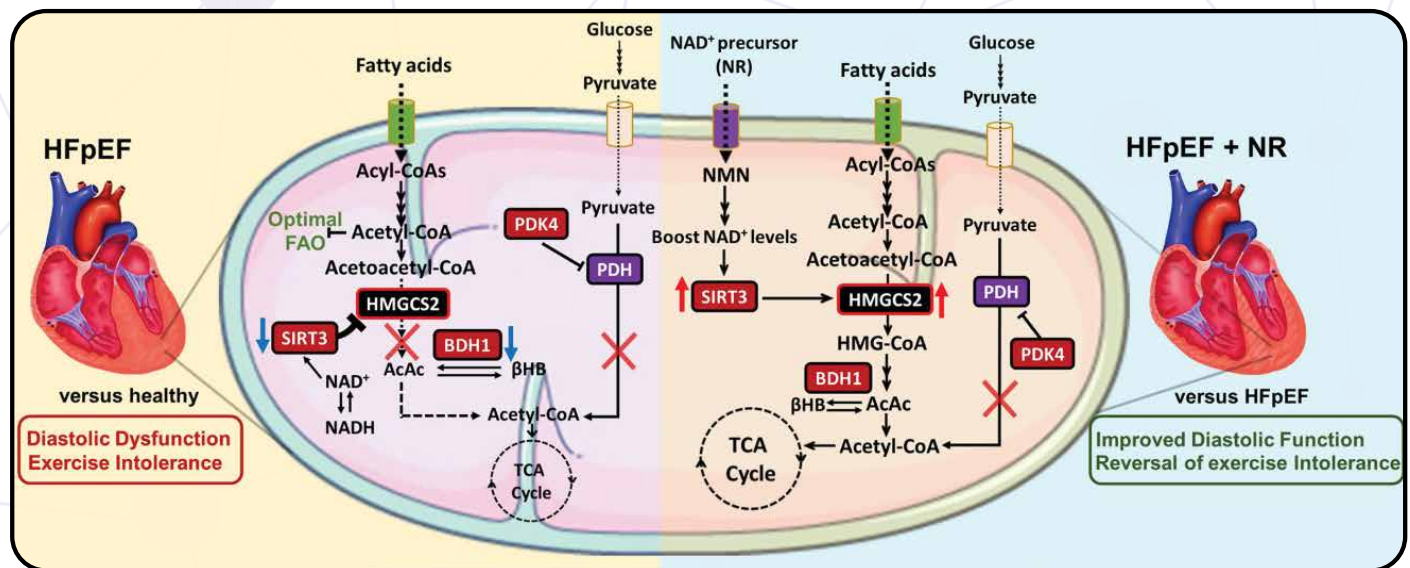
The Baird Institute is a leading research centre dedicated to pioneering advancements in heart and lung surgery. It relies entirely on private donations to fund its research activities conducted at the Charles Perkins Centre located at the University of Sydney next to RPAH. The more they learn, the greater their positive impact on people's lives, just like the impact they have had on mine.

RESEARCH PUBLISHED IN HIGH IMPACT INTERNATIONAL JOURNALS

Prof. John O'Sullivan, Dr. Koay, Prof. Lal, Prof. Bannon and Dr. Rob Hume

Baird Institute researchers have published two new papers in high impact international journals on exciting breakthroughs. Discover more about these papers below:

1. Prof. John O'Sullivan, Dr Koay, Prof. Lal, and Prof. Bannon have discovered for the first time ever that the human heart can make its own rescue fuel called ketones. They have also demonstrated how to augment this process to improve cardiac function in heart failure. Using genetic models, human heart tissue, human heart cells, isotope tracing, and "trans cardiac" blood sampling (Comparing blood going into the heart to blood leaving the heart), they identified how the machinery in this process is mechanistically involved. They will now screen new potential compounds as potential new therapies for patients. This work is in press at ***Circulation Research***, one of the world's top cardiology journals.



2. Dr Rob Hume, Associate Professor Sean Lal and visiting University of New South Wales medical student, Mr Matthew Cook, have recently published a review in the journal ***Heart***. This publication, entitled '*Transcriptional, proteomic and metabolic drivers of cardiac regeneration*', explores the current understanding of how the heart muscle grows during development, from the embryo to the adult. It also covers how the heart muscle has a limited ability to regrow following injury, a process known as cardiac regeneration. Importantly, it covers new strategies researchers are using to amplify cardiac regeneration, to heal hearts damaged by heart attacks (myocardial infarction). This research area is of particular interest to Dr Hume and A/Prof Lal, who are currently working on developing such therapies to regenerate damaged hearts and reverse heart failure.

SCHOLARSHIP & GRANTS PROGRAM

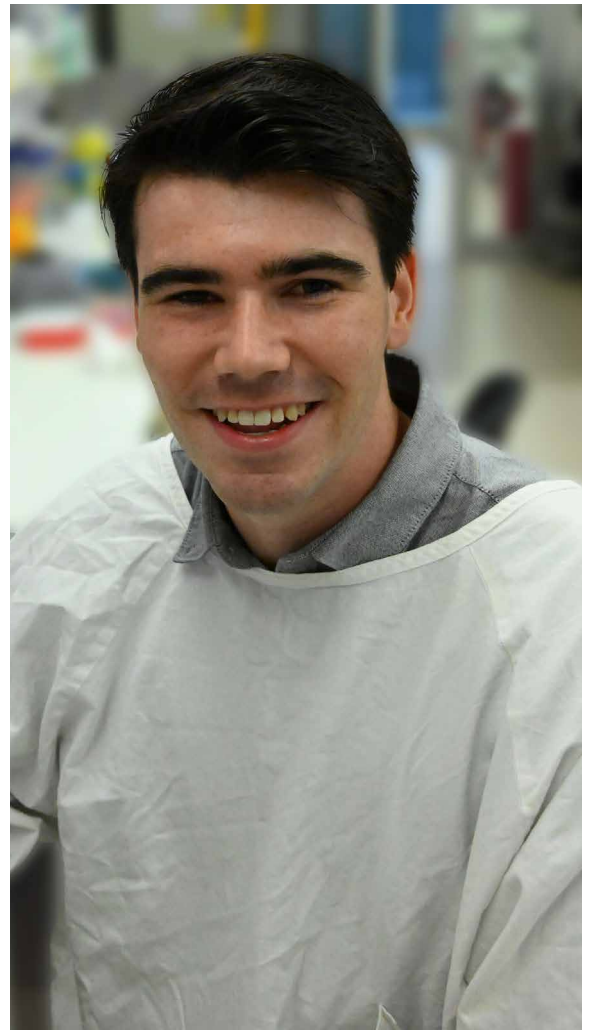
Scholarship Recipient - Wade Bocking

After graduating with a Bachelor of Science (Hons I) from the University of Sydney and working for Dr Grant Parnell as a research assistant at the Westmead Institute for Medical Research, I have pursued a PhD to follow my passion for advancing medical research under the supervision of the Baird Institute's Lead of Translational Research, Dr Robert Hume, and with the invaluable support of The Baird Institute.

A healthy circulatory system is essential for overall well-being, yet genetic and environmental factors can lead to vascular damage or blockages, resulting in life-threatening conditions. These complications often impair major organs and limbs due to insufficient delivery of nutrients and oxygen. To repair damaged vessels, surgeons often replace arteries with synthetic alternatives made from materials such as Dacron and Gore-Tex. However, these existing options often fail in the long term due to inadequate mechanical and physiological properties.

My research focuses on developing a degradable vascular graft designed to regenerate damaged vessels, ultimately restoring optimal blood flow and reducing life-threatening complications. If successful, these grafts could revolutionise vascular surgery by providing an 'off the shelf' solution that promotes natural vessel regeneration, mimicking the structure and function of a healthy vessel.

I am honoured and sincerely thankful to The Baird Institute and its supporters for the scholarship, and I am committed to producing high-quality research that advances vascular graft technology and improves health outcomes for those with cardiovascular disease.



BAIRD INSTITUTE WEBINARS



CATCH UP ON OUR WEBINARS AT ANY TIME

At The Baird Institute, we're committed to keeping our supporters informed and engaged through our online webinars. These sessions are a fantastic opportunity to hear from experts, learn more about the latest developments in heart and lung research, and to get an insider's view of the important work we're doing.

If you've ever missed a webinar or simply want to revisit one of our past sessions, don't worry – you can watch them at your own convenience! All of our webinars are recorded and available for viewing at any time. Simply visit our webpage at - **bairdinstitute.org.au/webinars**

Whether you want to catch up on a recent presentation or dive deeper into a topic of interest, our webinars are available for you to enjoy whenever it suits you. We hope you find them informative and inspiring.



A NOTE FROM OUR NEW ENGAGEMENT MANAGER

Lisa Turner, Clinical Nurse Consultant

I have been a Cardiothoracic nurse for 26 years, beginning my career in the Cardiothoracic Intensive Care Unit at Strathfield Private Hospital. It was there, in 1999, that I had the privilege of working alongside Professor Clifford Hughes and Professor Paul Bannon - an experience that sparked my long-standing affiliation with The Baird Institute.

Over the years, I've always appreciated the educational activities supported by The Baird Institute and have happily volunteered my time to assist with their fundraising efforts. As my career progressed into the field of research nursing, my connection to The Baird Institute deepened. Working on clinical trials and research projects supported by the Institute at Royal Prince Alfred Hospital, I saw first-hand the incredible impact their work can have on improving outcomes for patients with heart, lung, and aortic diseases.

Supporting The Baird Institute has always felt like a natural and meaningful extension of my professional journey. So, it was with a heavy heart that I left my research role at the end of 2024, following a decision my Partner, Barry, and I made to relocate our family to Caves Beach, just south of Newcastle.

Shortly after, an opportunity arose to officially join The Baird Institute team as Engagement Manager - and I didn't hesitate. In this role, I'm excited to connect with our generous donors and help coordinate the educational and fundraising events that are so vital to our mission.

I'm truly looking forward to this new chapter, and to meeting many of you along the way

LONG-TERM OUTCOMES OF CARDIAC SURGERY

Dhairya Vayada, Data Research Assistant

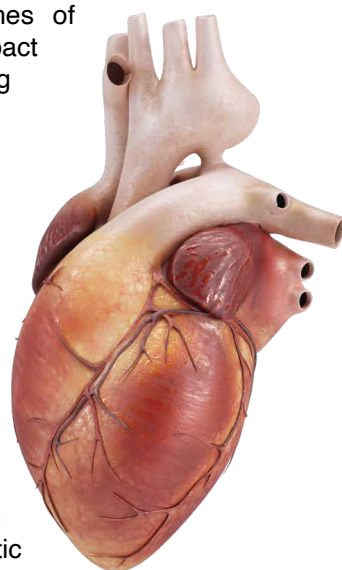
Royal Prince Alfred Hospital hosts a cardiac surgery database, which contains details on the demographics, risk factors pre-operative status, procedure, post-operative outcomes and short-term outcomes of each patient. This database has been the source of numerous studies in the past, and plays a crucial role in clinical audit, activity tracking and monitoring surgical performance. However, this database only tracks patients for 30-days after their surgery.

Knowing what happens to patients in the medium (1-5 years after surgery) and long term (>5 years after surgery) is very important, as surgeons and researchers strive to continuously improve survival outcomes, and quality of life for their patients. For instance, the effects of procedural aspects such as prosthesis choice in valve replacement, are only apparent 5 years after the procedure. Despite the well-defined need, there is a relative lack of long-term data on surgical outcomes, nationally and internationally.

With funding and support from The Baird Institute, our project aims to link this database to a larger database of all hospitalisations, emergency presentations and mortalities in NSW called CheReL. This will allow the researchers to study long-term outcomes for specific sub-groups of coronary surgery, aortic surgery, valve surgery, and other smaller, but important sub-groups such as elderly patients, and patients with hypertrophic cardiomyopathy who are undergoing myectomy. Valuable data on outcomes such as mortality, readmission to hospital, subsequent cardiac reinterventions and readmissions for cardiac failure will be obtained from this project. Having recently received the linked data, data analysis on the specific subgroups has now begun.

Knowledge of long-term outcomes of cardiac surgery can directly impact clinical decision making, affecting the interventions to be performed, and the timing and post-operative management of the interventions. The improvement in decision making may lead to benefits in the quality of life and survival for patients.

Based on the long-term data, Dr Matheus Carelli (Cardiothoracic Registrar, Royal Prince Alfred Hospital) presented an abstract on aortic root surgery – a specific sub-group of interest at The Australasian Thoracic Aortic Symposium 2025, in Melbourne on 27th March, 2025.



CHEQUES ARE BEING PHASED OUT IN AUSTRALIA – WHAT YOU NEED TO KNOW

Just like cassette tapes and typewriters, cheques have had their time in the spotlight, but now their use is steadily coming to an end in Australia.

Back in the 1980s, cheques made up the majority of non-cash payments. Even in the mid-1990s, the average person was still writing around 50 cheques a year. But as technology has advanced and online banking has become the norm, Australians have increasingly turned to faster and more convenient ways to pay. Today, fewer than one cheque is written per person each year.

Because of this shift, the Australian Government has announced that the country's cheque system will be fully phased out by 2030. Government departments will stop using cheques even earlier – by the end of 2028 – and many banks have already started scaling back their cheque services.

We know this change may affect some of our loyal supporters who have used cheques for years to make their kind donations. You're not alone, many older Australians and small businesses still use cheques for things like bills, rent, or larger purchases. That's why the government has planned a long, gradual transition, giving everyone time to adjust. Your bank should also be reaching out to their customers to explain the alternatives and to offer support during the changeover.

So, what can you use instead of cheques? There are several options available:

- Debit or credit card payments
- Australia Post money orders (a paper-based option still available but for a fee)
- Phone banking or internet banking
- In-person bank branch services

At The Baird Institute we're incredibly grateful for every donation we receive – no matter how it arrives. As the country moves away from cheques, we'll be here to support you with other easy and secure ways to give. Whether that's by debit or credit card, bank transfer, or another method you're comfortable with, our team is always happy to help.

If you currently donate by cheque and have any questions or concerns, please don't hesitate to reach out. We want this change to be as smooth and stress-free as possible, and we'll be keeping our supporters informed every step of the way.

Vale

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

- | | |
|-------------------|--------------------|
| • Marie Mackie | • Frances Apps |
| • John Spencer | • Desmond Houlihan |
| • Muharrem Tunc | • Anthony Goodman |
| • Rodney Vova | • Brian Cusworth |
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