THE BAIRD INSTITUTE
Applied heart & lung surgical research

heart TO HEART

MAY 2023

The Baird Institute's 21st Birthday

On 17th November 2022 we celebrated our 21st birthday at Rydges Hotel in Camperdown. It was a great night spent with our team and our many supporters, to mark 21 years of ground-breaking cardiothoracic surgical research. Although we usually get together annually with our supporters to provide an update on our work, this had not been possible for the past 3 years due to Covid-19. Our last event was held in December 2019, just as the first cases of Covid were evidenced overseas.

Our Patron, The Hon Michael Kirby AC CMG, commenced the proceedings with a welcome to the Institute's supporters present and described how much their support was appreciated over the past 21 years. Our Chair, Professor Paul Bannon followed with an explanation of the pivotal role The Baird Institute had played in cardiothoracic surgical research and training since our inception. In addition, he explained how The Baird Institute had developed from a typical surgical research group in 2001 focusing on surgical outcomes to undertaking translational research today.

Board member, Associate Professor Sean Lal, talked about the newly established Centre for Heart Failure & Diseases of The Aorta and its focus on three major areas: innovative heart valve design, heart failure and the biomechanics of the human aorta.

Prof. Bannon introduced Dr Robert Hume, our post-doctoral fellow who will lead a team in the Centre for Heart Failure & Diseases of The Aorta. This team will utilise human and model system heart failure so as to understand key disease processes in heart failure and aortic disease.

Prof Bannon led a Q&A with two of his patients – twin brothers Paul & Simon Molino – who both had open heart surgery in 2022, a few weeks apart from each other. They were just 39 years of age. They generously shared with the group their experience pre- and post-surgery and the benefit that our research could have on their families. It was very moving hearing of their experience – both quite different – in addition to the impact on them and their families

Finally, generous Baird Institute supporter, Will Bird talked briefly on behalf of his family about their decision to support The Baird Institute's Aortic Research program. The Bird family are greatly assisting us in the funding of Dr Hume's fellowship over the next 3 years and for this we are most grateful. Will's father, 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. Prof Bannon presented Will and his family with a plaque in recognition of their support of The Baird Institute over several years.

Following the presentations, we were served with some excellent canapes and refreshments. Everybody sang Happy Birthday to The Baird Institute and cut a very large cake in memory of its 21 years. We are very appreciative to Rydges Hotel, Camperdown, and Mr Jack Tolani for their generosity in funding a large part of the birthday celebrations.

THE BAIRD INSTITUTE CHAIR, CEO, BOARD MEMBER, RESEARCHERS AND ADMIN STAFF

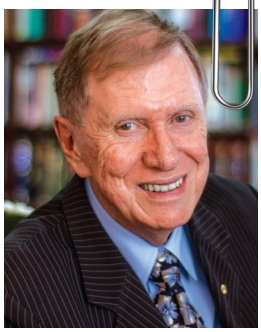
Front Row - From Left to Right

Julia Favotto – Admin Assistant
Sue Moore - Admin & Events Manager
India Perianayagam – Admin Assistant
Lisa Turner – Research CNC
Catherine Rush – CEO
Lorna Beattie – Clinical Trials CNC
Cassandra Malecki - Post Doctoral Researcher

Back Row - From Left to Right

Tatum Faber – Admin Assistant
Paul Bannon – Chair
Ross Saunders – Board member
Robert Hume – Post Doctoral Researcher

A NOTE FROM OUR PATRON



The Hon. Michael Kirby AC CMG

I love the Baird Institute for many reasons.

At the University of Sydney, I enjoyed a friendship with Professor Douglas Baird. We were each elected to the Board of the Sydney University Union in the 1960s. He became a gifted surgeon, and he had a mind stronger than steel. He developed great skills as a surgeon, specifically whilst working with military personnel in Vietnam. Douglas Baird became a surgeon who pushed the boundaries of cardiac surgery and research.

One of his early patients for bypass surgery was my mother. She died many years later. But her heart was beating strongly right up to the end. Later, warned by her experience, I sought care from our present Chair, Professor Paul Bannon. He displays the same skill and imagination of my friend Doug Baird. I will always be grateful for his surgical skills.

These newsletters show that The Baird Institute has not stood still. It has embarked upon new and bold research projects that were not dreamed of in Doug Baird's lifetime. It has continued to oversee the needs of surgical innovation and research of cardiac patients at RPAH. In some ways, it is like a family. Young and not so young specialists, including from overseas, have contributed to the work that The Baird Institute undertakes for the future of scientific surgical advancement.

Inevitably, supporters of The Baird Institute, coming from a cohort including those suffering very serious cardiac deficiencies, pass on as my beloved mother did in 1998. However, many ex-patients come to our functions; listen to the briefings on developments; and survive well beyond what might have been. I am one of them. It is always a joy to be with those who have benefited from the work of the Institute and RPAH. Mention is made in this newsletter of a generous donation provided in the Will of one such patient. I have included provision for The Baird Institute in my Will, made in common form with my partner, Johan van Vloten. I commend to those in the position to do so, providing support to The Baird Institute in such a tangible way. Helping others; helping ourselves.

Patron, The Baird Institute

A NOTE FROM THE CEO

Dear Valued Supporters

We are thrilled to present you with the latest edition of our biannual newsletter ***-Heart to Heart.*** *As always, we are grateful for your continued support of our mission - to foster research and apply science to improve the outcomes for patients facing heart or lung surgery.*

Over the past 6 months, our team has been hard at work, pushing the boundaries of what we know about the human heart and lungs. We are excited to share with you some of our work within this newsletter.

Dr Robert Hume, who works in the Centre for ***Heart Failure & Diseases of The Aorta,*** *is currently in the design and engineering phase for a biodegradable aorta replacement graft that would encourage the patient's own body to regrow new aortic tissue.*

A/Prof Sean Lal writes about the ***Sydney Heart Bank (SHB),*** *a biobank of international standards that currently procures heart, aortic, and vascular samples from patients at Royal Prince Alfred Hospital for research purposes, however, since 1989 the SHB has collected and stored explanted human hearts from patients at St Vincent's Hospital.*

Finally, some of you might have seen Cardiothoracic Surgeon and Baird Institute Board member, A/Prof Christopher Cao, on the RPA television series on Channel 9 a few weeks ago. Dr Cao used minimally invasive techniques when operating on his patient, Theo. As he explains to Theo, these techniques require smaller incisions and less anaesthesia than full open chest surgery, resulting in faster recovery times and fewer complications and thus better outcomes for patients.

None of this work would be possible without the support of our generous donors which has allowed us to fund ground-breaking research ***and*** *attract some of the best minds in the field. We are committed to continuing our work to improve the lives of patients with heart and lung disease.*

Thank you for being a part of The Baird Institute family. None of these advancements would have been possible without your generous support. We look forward to sharing more updates with you in the future.

Kindest Regards

Catherine Rush
CEO, The Baird Institute

RPA – THE TV SHOW

A/Prof Christopher Cao

The RPA series on Channel 9 follows patients who bravely and generously share their stories. Filmed at Royal Prince Alfred Hospital in Camperdown, Sydney, this reality program shows the everyday workings of this major hospital, detailing the sicknesses and operation procedures of its patients.

In Episode 2 of the new series, which aired on 3 April 2023, Cardiothoracic Surgeon and Baird Institute board member, A/Professor Christopher Cao had a starring role alongside his patient, Theo. After getting COVID, doctors discovered during a routine scan that father of 3, Theo, had a large lesion (the size of a small fist) in his chest.

Dr Cao explained to Theo that most surgeons would do a full chest opening – a sternotomy – to remove the tumour, but he on the other hand, typically utilises minimally invasive robotic surgery for this procedure – a revolutionary approach. During surgery, Dr Cao makes three small cuts of about 8mm on the side of the chest and inserts ports into the holes. Through the ports, Dr Cao is able to insert a number of instruments that he controls to separate the lesion from the heart and blood vessels and chest wall. This robotic surgery means that Theo will be in hospital for just 2 or 3 days, on painkillers for 2 to 3 weeks and he can go back to his physical activities in a much shorter period of time than if the lesion had been removed via a full chest opening. Luckily, all turned out well for Theo. See this episode, and all others in the series, on 9Now.

BUILDING A PLATFORM FOR SURGICAL PERFORMANCE AND AUDIT

Dhairya Vayada, BBiomedSc,

Data Research Assistant, The Baird Institute

With a substantial amount of information collected before, during and after a surgery, there is a large amount of data generated. This data can be used to uncover rich insights into the surgical process, helping the surgeons to identify trends, performance, and ways to improve patient outcomes and experience.

One of the challenges is to present the data in a way that enables the surgeons to interpret insights and draw meaningful information from it. I am currently working on a secure clinical data analytics platform to present anonymized data in a graphical and interactive format. Key components of this platform include; surgical dashboards which enable each surgeon to analyse their key metrics and performance as well as observe the unit's performance as a whole; a resource utilization dashboard to observe how the unit uses resources during surgery; and finally the plotting of surgical patients' locations on an interactive map.

The platform has enabled the automation of some parts of the auditing process, allowing graphs and tables for the quarterly surgical audit to be generated instantly. The platform is also modular and future-oriented so technologies such as artificial intelligence and machine learning can be rapidly implemented, helping the cardiothoracic surgeons identify areas for potential research and scope for patient outcome improvement.

THE SYDNEY HEART BANK (SHB)

Centre for Heart Failure and Diseases of the Aorta
A/Prof Sean Lal

CENTRE FOR HEART FAILURE & DISEASES OF THE AORTA
SYDNEY

In 1989, in collaboration with the late Dr. Victor Chang AO, Prof. Cris dos Remedios established the Sydney Heart Bank (SHB) at the University of Sydney to collect and store explanted human hearts for research purposes. The SHB now comprises over 18,000 human cardiac samples from explanted failing hearts and non-diseased donor hearts from patients at St Vincent's Hospital Sydney. In more recent years, under the Directorship of A/Prof Sean Lal, the SHB is now a biobank of international standards that has also expanded to prospectively procure heart, aortic, and vascular samples from patients at Royal Prince Alfred Hospital in collaboration with Prof Paul Bannon and Dr Jacky Loa.

The SHB is completely not-for-profit and collaborates with over 30 research laboratories within Australia and around the world. The independent external research projects are in conjunction with our own in-house projects. The research projects range from examining cardiac regeneration, contractile mechanics cellular and molecular cardiology, cardiac proteomics, vascular diseases, and aortic diseases.

We gratefully thank the support of The Baird Institute and the Faculty of Medicine and Health at the University of Sydney in maintaining the infrastructure, staffing, and operations of the SHB. We also acknowledge the patients and staff of St. Vincent's Hospital Sydney and Royal Prince Alfred Hospital.

SHB Executive

A/Prof Sean Lal
Prof Paul Bannon

Biobank Manager

Dr Cassandra Malecki

Biobank RA

Ms Sheena Mali

RPA biobank team

Prof Paul Bannon (Cardiothoracic Surgeon)
Dr Jacky Loa (Vascular Surgeon)
A/Prof Sean Lal (Cardiologist)
Senior clinical nurses; Lisa Turner & Lorna Beattie,

Research Update

Dr. Robert Hume PhD, Senior Postdoctoral Fellow,

The Rob Bird Aortic Research Program, Centre for Heart Failure and Diseases of the Aorta.

I joined The Baird Institute 6 months ago as a Postdoctoral Research Fellow and have thoroughly enjoyed every minute of my time thus far. The knowledgeable team and access to rare and precious samples, as well as the high-end technology available at my disposal has enabled me to really thrive. Projects are really progressing at a remarkable rate and big publications are on the horizon.

One exciting project I am currently working on is the synthesis and implantation of an aorta replacement graft. For this work we are currently in the designing and engineering phase for a biodegradable graft that would encourage the patient's own body to regrow new aorta tissue. The idea behind this is to replace damaged blood vessels, such as the aorta, with our graft so the body can heal itself by replacing the graft with new tissue, thus leaving nothing synthetic behind. This is a large project which will span multiple years but if successful will be on the cutting edge of vessel replacements and aorta research.

All of this work would not be even remotely possible without the kind and generous gifts of our donors, to which we are eternally grateful.

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.

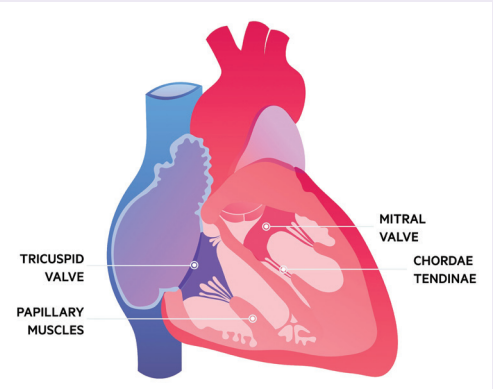
The Role Of The Anterior Mitral Leaflet On Left Ventricuclar Function

DR LAURENCIE BRUNEL & PROF. PAUL BANNON

The left side of the heart has 2 chambers (left atrium and ventricle) separated by a valve called the mitral valve. The mitral valve prevents back flow and supports the function of the left ventricle (main pumping chamber of the heart that supplies oxygenated blood to the body and thus essential for life). This valve has two leaflets (anterior and posterior) hinged on the annulus (an ill-defined structure at the junction between the atrium and ventricle).

When the original mitral valve fails to work properly, it can be replaced with an artificial one with the aim of restoring effective blood supply to the body. Valves can be replaced either by opening the chest and heart to insert it (open technique), or by inserting the valve using a minimally invasive approach via a large blood vessel (transcatheter insertion). When the original valve is replaced with an artificial one, there are the options of removing the original one or leaving it in place alongside the new one, or even altering the shape of the original valve. However, all options can severely impair left ventricular function and thus the effective pumping of oxygenated blood to the entire body. Ineffective pumping of blood is a major reason for mortality following valve replacement.

The objectives of our research were to establish a stable and reproducible model to evaluate the effects of commonly used surgical options for the original valve when inserting an artificial valve in clinical practice, with the aim of ultimately improving left ventricular function and therefore quality of life and survival rates of patients requiring a mitral valve replacement.



In current clinical practice, the anterior mitral leaflet is most commonly removed at the time of a valve insertion. Our first study aimed to investigate methods of safely retaining the original anterior leaflet at the time of insertion. This first study found that retaining that leaflet in place, when replacing the valve, caused obstruction in blood flow inside the heart, so clearly, we had to develop other techniques to avoid this.

Some minimally invasive valve replacements are designed to deal with the anterior mitral leaflet, as are some open surgical techniques. So, during our second study we looked at the effects of these techniques on heart function. These studies demonstrated that these methods also adversely affected the heart. Clinically, this at least in part explains the poor outcomes in patients who already have poor heart function going into surgery and in fact we may be making it worse.

We did further investigation into other techniques and the results were all the same. This led us to the conclusion that future designs of any valves, needed to understand that the entire mitral valve apparatus had to be retained, but in some way, we needed to fix the valve function. Hence the importance of this study.

JAMES WADLAND NIGHT OF HEARTS (JWNOH)

NATALIE ZUGEC

The 9th Annual JWNOH was held at Sharkies at Kareela on 2nd April, 2023. The event is held in honour of my late husband, James Wadland, who at 35 years of age passed away from an aortic aneurysm in 2013. Each year on his birthday, the event raises funds for The Baird Institute to support the continuation of their ground-breaking research into heart and lung disease. It is an opportunity for family and friends to come together and remember our beloved James and his legacy.

As a family we were suddenly left without a husband and father and our world became unbearable and devastating. Discovering the cause of his death was shocking knowing that his bicuspid valve was genetic and that it could have been prevented. Working with The Baird Institute has given me an insight into the importance of research in heart disease and genetics. A not-for-profit organization that relies purely on donations from its supporters is remarkable.

The Baird Institute has given me the opportunity to channel my grief into raising awareness of the work they do and to support research that continues to save lives so that other families don't go through the trauma of losing a loved one. As a mum of two children knowing that even though we have been forever affected by such a devastating loss, we can choose to make a difference!

Please join our JWNOH team in this year's City2Surf on 13th August 2023 and let's make a difference together!

A Bequest

REVEREND JACK AND MRS WINSOME SHARP

Winsome Sharp passed away in 2022 at the grand old age of 98. She would have been 100 years of age this month. Winsome and her husband Jack were avid and longstanding supporters of The Baird Institute, having made their first donation back in 2010. Jack was the one with heart issues and unfortunately, he passed away from a heart attack in 2014, but Winsome continued their annual donations until her death in 2022. In addition to their annual support, the Sharps left a Gift in their Will of $20,000 to The Baird Institute and this was passed on to us in March this year.

Reverend Jack and Mrs Winsome Sharp were missionaries with Methodist Overseas Missions in Papua New Guinea for 32 years. They travelled to their first posting, at Namatanai on New Ireland, a few weeks after their marriage in 1950. They had several more postings in Papua New Guinea, with the last one being in Bougainville. In 1968 the United Church in Papua New Guinea and the Solomon Islands was inaugurated and Reverend Sharp was elected as the first Moderator, presiding over the whole church. They returned to Australia in 1982 and moved to Windsor, New South Wales, for Jack's last appointment at the Windsor Uniting Church before he retired in 1988. However, even in retirement they together remained active and committed members of the community, volunteering with Lifeline and local community organisations in addition to the church. Jack and Winsome were people of great faith, working very closely together in dedicated service to people and ministry.

The Baird Institute is extremely grateful for the Sharp's generosity in supporting heart and lung surgical research and we pass on our condolences to their families.

If you are interested in finding out more information about leaving a Gift in your Will to The Baird Institute or for a confidential discussion, call our CEO, Catherine Rush on 02 9550 2350

Vale

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

- Nunziato Melita
- Charles Olsen
- Fortunato Conti
- Peter Sherman
- Cyril Clymo
- Barry Sheridan
- Terese Mazzeo
- Robert Gore

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, however we would particularly like to thank our principal supporters.

THE Lin Huddleston CHARITABLE FOUNDATION

Edwards

Baxter

[CHOICE] PRO prosafetygear.com SAFETY GEAR

For a full list of all research publications of **The Baird Institute**, please go to our website **www.bairdinstitute.org.au/our-publications/**

DONATE

ONLINE VIA OUR SECURE WEBSITE

bairdinstitute.org.au

THE BAIRD INSTITUTE
Applied heart & lung surgical research

REGISTERED CHARITY · acnc.gov.au/charityregister

NSW GOVERNMENT Health Sydney Local Health District

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