



**THE BAIRD
INSTITUTE**
Applied heart & lung surgical research

heart TO HEART

DECEMBER 2020

Dear Valued Supporters

What an unprecedented year we have had with many challenges on many fronts!

Thanks to our dedicated supporters, who have continued to be so generous throughout these difficult times, we have been able to continue to fulfil our mission - to foster research and apply science to improve the outcomes for patients facing heart or lung surgery. Specifically, your support has enabled a world first pre-clinical study by Prof. Bannon and researchers from the University of Sydney who have demonstrated that a mini heart support machine called an "Impella" could be implanted in the heart of the sickest of patients with acute heart failure, without the need to move them from the Intensive Care Unit they need so much. You may have recently seen the report on this study on Channel 9 news.



I would like to welcome Dr Sean Lal to the Board of The Baird Institute. Sean is an academic in the Faculty of Medicine and Health at the University of Sydney and a Consultant Cardiologist at RPAH and will be an excellent addition to the Board. In addition, Professor Martin Misfield has joined the RPAH Cardiothoracic Department as Co-director of Research. Martin is a Professor, Senior Consultant and the Clinical Lead of Minimally Invasive Surgery (MIS) at the Leipzig Heart Centre in Germany, one of the pioneering centres in the world for MIS. The appointment of Martin to this research role will allow the Cardiothoracic Department to undertake clinical and basic research within an international network.

Finally, a big congratulations to one of our Scholarship recipients, Dr Kei Woldendorp, who has submitted the thesis for his MPhil and is currently awaiting allocation of examiners and marking. There is an interview with Kei in this newsletter so you will be able to discover more about his research.

On behalf of the team at The Baird Institute, a sincere thank you to all our donors for their continuing trust and support. Best wishes to you and your families for the holiday season and for a healthy and happy 2021.

Catherine

Catherine Rush
CEO, The Baird Institute

A NOTE FROM OUR PATRON

The Hon. Michael Kirby AC CMG

Phew! We Made It Through 2020!

We should always be grateful for any year that we have lived, especially if it has been with family and friends. The Baird Institute does wonderful work to protect, preserve and prolong the lives of so many. Cardiovascular disease is such a huge challenge in our country. A lot of us, who support The Baird Institute, owe the gift of life to the skilled surgeons and brilliant researchers. As I do.

The year 2020 has been extremely difficult for many of us. But also for The Baird Institute. Many of our programs have not been able to operate this year.

The Baird Institute was due to have its third heart and lung nurses' conference in September 2020, however, this could not go ahead because of the requirements of social distancing. Likewise, our heart and lung surgery patient support group meetings have been postponed. And our much anticipated "Harp to Heart" concert, by the Doctors' Orchestra at Chatswood has been postponed twice. We hope that this will go ahead in March 2021. However, as Donald Trump has learned, with COVID-19 no one can be sure. And the best laid plans of mice and men often go awry.

This is therefore a difficult time for fundraising for the vital work of The Baird Institute which must go on and even expand. The funding has fallen in 2020. In a time of uncertainty, this is understandable. However, hopefully we will soon have therapies and a safe vaccine. Medical research is the key to so much else in our world. For people with heart and lung disease and disorders, The Baird Institute's research is vital. All of us should try to help.

Even during the dark days of the pandemic, with the help of our supporters, The Baird Institute's research has continued. Some of our scholarship recipients and our clinical trials teams have been finding the recruitment of patients for study difficult. Yet they have continued to progress. One of The Baird Institute's scholarship recipients, Dr Kei Woldendorp, is about to complete his Master of Philosophy degree. He is thinking of going on to complete a PhD. Much research happens in the quietness of the brilliant minds of individual human beings. Whether it is with viral infections or heart and lung disease, we must support the scientists, surgeons and technicians of the future.

As this unusual year departs, we must have confidence that 2021 will bring great new achievements for The Baird Institute. We owe this to each other and the world.



Michael Kirby

APPOINTMENT OF DR SEAN LAL TO THE BOARD OF THE BAIRD INSTITUTE

BMedSci(Hons), MBBS(Hons), MPhil(Med), PhD(Med), FRACP



We warmly welcome Dr Sean Lal, Cardiologist, to the Board of The Baird Institute as Non-Executive Director.

Dr Sean Lal is an Academic in the Faculty of Medicine and Health at the University of Sydney and a Consultant Cardiologist at Royal Prince Alfred Hospital, sub-specialising in heart failure and cardiac MRI. He is also the Chair of the Heart Failure Council for the Cardiac Society of Australia and New Zealand.

Sean has a clinical and research interest in heart failure. For his PhD in this field, he was awarded a combined National Health and Medical Research Council (NHMRC) and National Heart Foundation (NHF) Scholarship, as well as the NHMRC and Royal Australasian College of Physicians (RACP) scholarship for research excellence.

Sean was also awarded a Commonwealth Endeavour Postgraduate Fellowship to Harvard University and Massachusetts Institute of Technology (MIT), where he undertook studies demonstrating the intrinsic regenerative capacity of the human heart following myocardial infarction; whilst also gaining clinical experience in acute heart failure management in the cardiac ICU at the Brigham and Women's Hospital.

Sean is the Director of the Sydney Heart Bank at the University of Sydney, which is one of the largest biorepositories of cryopreserved human heart tissue in the world and something you will hear more of later in this newsletter. He is the Head of the Cardiac Research Laboratory in the School of Medical Sciences at the Charles Perkins Centre, which focuses on basic science and translational research into human heart failure.

EDUCATION AND TRAINING *Update*

Dr. Brian Plunkett

Education and training for the registrar and junior medical officers started with a well organised and exciting rota of topics focussing on sessions to cement skills in sternotomy, chest management, cannulation and anastomosis. These sessions were conducted via a variety of means including wet and dry labs combined with simulation sessions in partnerships with the *Institute of Academic Surgery (IAS)* and the *Charles Perkins Centre (CPC)*. Didactic teaching sessions continued with a combined focus on cardiac anatomy, as well as continuing alliances with other allied specialised fields including critical care and anaesthesia. Unfortunately, the face to face teaching components of the program were significantly impacted by Covid-19, however alternative methods such as telehealth and videoconferencing, and smaller more focussed sessions were introduced to ensure learning opportunities were still being offered.

2021 looks to be our most exciting year yet, with a newly designed program making use of regular teaching timeslots in the *IAS* and *CPC*, focussing once again on utilising the amazing technology and teaching we have access to here at RPAH.

SCHOLARSHIPS AND GRANTS PROGRAM

An Interview with Dr Kei Waldendorp

Cardiothoracic surgical registrar at RPAH, a Master of Philosophy candidate at University of Sydney and the recipient of a Baird Institute Scholarship

What is your research topic?

Neurological injury after transcatheter aortic valve Implantation (TAVI). My research looks at aortic valve intervention post-operative stroke and neurological outcome. I am looking at both open surgical and minimally invasive techniques in my research.

What is the aim of your research?

To investigate the incidence, causes, and potential treatments of stroke and other neurological injury after transcatheter aortic valve replacement. The goal of this research is first and foremost to improve guidelines for patient selection as these procedures and techniques continue to evolve in the future, as well as understanding how these patients progress after their procedure. Stroke remains a devastating although fortunately rare outcome for aortic valve intervention. By understanding the risk factors that underly stroke, we hope to improve patient selection into different pathways and streams of management for aortic valve surgery or intervention and in the rare instances where stroke does occur we hope to understand how patients may progress and how treatment may help in their post-operative recovery, to reduce their burden or their quality of life.

What is the potential impact of your research?

As transcatheter aortic valve replacements (TAVI) expand to include lower risk and younger patients it is imperative to understand neurological injury associated with this procedure. An understanding of the causes may allow clinicians to develop new strategies to prevent or treat complications more effectively. An overview of this phenomenon may also allow clinical indications to be defined for TAVI to balance benefits and risk compared to alternative treatments such as surgical aortic valve replacement.

A total of 11 publications have been created through the research into this topic. Seven have been published and four are currently under review for consideration in peer reviewed journals, and will be submitted towards the end of the year for the award of the degree of Master of Philosophy at The University of Sydney.

How has your scholarship from The Baird Institute helped you?

I have been fortunate enough to have been supported by a scholarship from The Baird Institute throughout my research and it has really assisted me in gaining access to quite high powered statistical software and hardware to analyse the data that we have collected. It has also allowed me to present my research at conferences both locally and internationally enabling me to share my ideas with my peers. By disseminating these ideas we hope to garner more interest and start more research in this area to help improve patient outcomes and patient safety in the future. I thank all those generous supporters of The Baird Institute for giving me this great opportunity to attain an MPhil and do life-saving research.



RESEARCH REPORT *The Year in Review*



Professor Paul Bannon

At Royal Prince Alfred Hospital our team performs more than 650 heart operations and 350 lung procedures each year making it the largest heart and lung surgical program in NSW. It also has the largest TAVI (Transcatheter Aortic Valve Implantation) program in the state. We are the most academic program in the country boasting more publications across a wide range of research interests than any other unit. Our specialty surgeries include major aortic reconstruction, minimally invasive valve and lung surgery, robotic surgery and beating heart bypass surgery. We pioneered the ECMO (Extracorporeal Membrane Oxygenation) retrieval program for acute heart and lung failure during the swine flu epidemic and continue that role during the COVID-19 pandemic.

We take great pride in the fact that each of our clinical programs is supported by a research program. This includes our teaching program, where we measure how well our targeted skills sessions hone a young surgeon's skills, before the surgeon takes their place at the operating table. The help of our amazing supporters makes all of this possible.

Our former Head of Department, Professor Douglas Baird, was instrumental in setting up the National Heart Foundation and in later years the Heart Research Institute. This reflected his unwavering commitment to surgical outcome reporting and the importance of basic scientific research in surgery.

SURGICAL OUTCOMES RESEARCH PROGRAM

This Surgical Outcomes Research Program has continued and expanded the work of Professor Baird, now with a database of over 11,000 patients which allows us to compare newer with

more traditional surgical procedures, looking for the best survival results and best quality of life.

BIOBANKING PROGRAM

The *Sydney Heart Bank at the Charles Perkins Centre, University of Sydney* stores consenting patients' tissue and blood samples to facilitate future research into the genetic and epigenetic (such as smoking and blood pressure) causes of aortic aneurysm disease and heart failure mechanisms. This resource is truly one of a kind and has allowed multiple local and international research collaborations. Its linkage to the database provides us with a real chance to look back at what we have done to work out more timely and targeted interventions in the future.

CLINICAL TRIALS

Our Clinical Trials Team operates with the support of the *Sydney Local Health District* and has contributed to many International Trials that have shaped the way we do things today. Blood conservation techniques, the value of beating heart surgery and the performance of different types of heart valves have all been investigated by the team over the years. They continue to contribute by being the lead investigators in several trials.

These aforementioned programs have been supported by **The Baird Institute**, set up almost 20 years ago in honour of Professor Baird. The Institute's commitment to bettering the lives and improving the outcomes of those undergoing heart and lung surgery by supporting clinical and basic scientific research has never wavered and this would definitely not have been possible without the steadfast support of our donors, some of whom have been supporting us since our inception.





TRANSLATIONAL RESEARCH PROGRAM

The most exciting part of the research program supported by *The Baird Institute, the Department of Cardiothoracic Surgery and Sydney Imaging at the University of Sydney* is the **Translational Research Program (TRP)**. The magic of the TRP happens in the basement of the *Charles Perkins Centre (CPC)* in the *Hybrid Research Theatre* which many of our supporters have visited. The *Hybrid Theatre* is a state-of-the-art facility comprising of a fully functional theatre with on table high resolution CT scanner controlled by a robotic arm. Here, in the Hybrid Theatre we are able to perform all forms of major surgery including heart surgery.

The **Translational Research Program** is divided into two parts. The first part called the **Innovative Robotic (iRobot) Program** looks at not simply operating with the aid of a robot but investigating just how much the robot can do without us. In essence, what can it do that we cannot? The Baird Institute and the *Australian Centre for Field Robotics* have joined forces and purchased the Kuka Robotic Arm to interface with the Siemens Artis Pheno robot to answer this question. The second part, called the **Broken Heart Program**, is the absolute pinnacle of what our research is trying

to achieve. This is where we combine everything we know, and a wide range of skill sets to predict and model surgical corrective techniques to the individual. We then test the model in the research theatre by looking at the structural integrity of the repair.

We have had extraordinary early success with placing the smallest **heart support machine** (called an Impella) into the heart guided by an even smaller 3D ultrasound probe, placed through a neck vein to look at the heart. In time, this will allow us to treat acute heart failure in the sickest of patients without moving them from the Intensive Care Unit they need so much.

The real value of the *Hybrid Theatre* and the **TRP** is yet to be realised. The planned second stage of the development which involved the purchase of a 3D MRI scanner is currently at risk, ironically because of funding restrictions due to the COVID-19 pandemic. The theatre site was designed and constructed to allow a dedicated 3D MRI scanner to be placed in line with the operating theatre which would have broad clinical and research applications. If we were to lose the capability to purchase this MRI it would be extremely limiting to the research program for the future.

THORACIC DATABASE

A/Professor Chris Cao and Dr Nicholas McNamara

With generous support from the donors of The Baird Institute, the Royal Prince Alfred Hospital's Department of Cardiothoracic Surgery recently re-established a Thoracic Database to collect clinical data for patients undergoing thoracic surgery. The primary function of this Database is quality assurance of key performance indicators; however, the database also serves as a useful tool for academic research. After a preliminary period of 6 months trialling the new database, a Departmental review was conducted and we are excited to report that the revision process undertaken in 2019 to develop a more complete database has been a success. Data completion rates for pre and postoperative outcomes have improved significantly, from an average of 50% in 2019 to over 90% for the majority of variables (eg. patient baseline characteristics, operative details, postoperative outcomes, and long-term survival) in 2020.

Importantly, we have been able to achieve very high data completion rates for all variables in patients who underwent Robotic-assisted thoracic surgical procedures. As one of the only public hospitals in Australia that offers Robotic-assisted thoracic surgery, we are at the forefront of developing such a programme



and demonstrating a benefit to patients without compromising safety. To date, we have performed 29 robotic surgeries with an excellent safety profile. Future work in this area will focus on collecting postoperative pain data to assess whether this minimally invasive approach leads to reduced pain and faster return to usual daily activities.

WELCOME TO PROFESSOR MARTIN MISFELD

Co-Director of Research, Cardiothoracic Department, RPAH

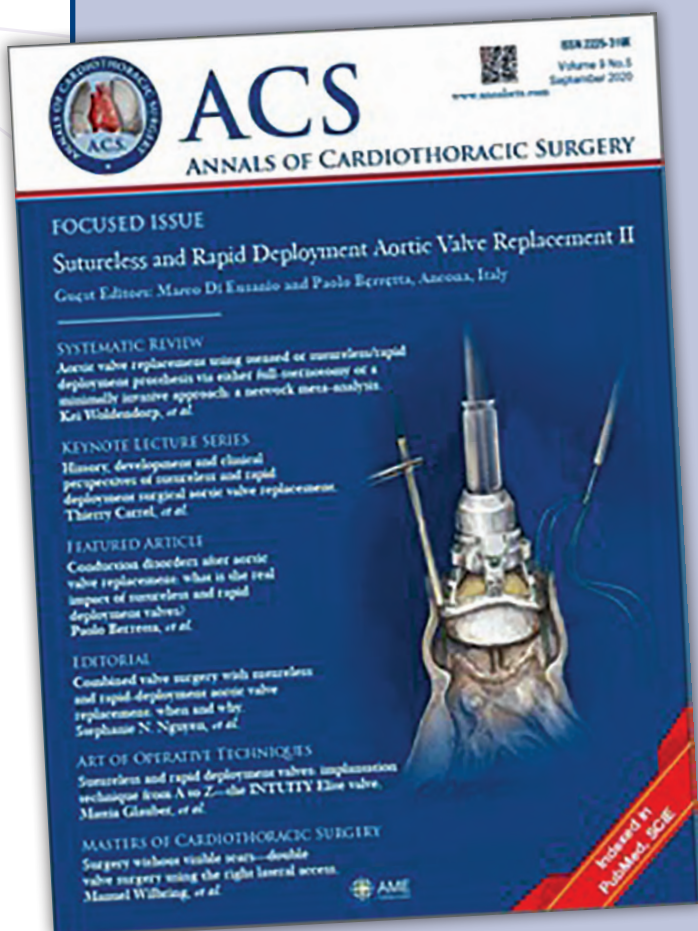
We warmly welcome Prof Martin Misfeld. Martin is a Clinical Professor and Visiting Medical Officer in Cardiothoracic Surgery at RPAH. He is also the Co-Director of Research in the Cardiothoracic Department and a Senior Cardiothoracic Academic Advisor and International Proctor within RPA's Institute of Academic Surgery. In addition, Martin has an Honorary Professorship at the University of Sydney.

Martin was born in Hamburg Germany, where he also went to medical school. He trained to be a Cardiothoracic surgeon in Luebeck near the Baltic Sea, in London and in Sydney. In 2009, he moved to Leipzig, in the former East Germany. The Leipzig Heart Centre is one of Europe's biggest cardiac centres with more than 3,700 heart operations performed each year. Martin is a Professor and Senior Consultant and the clinical lead of minimally invasive surgery (MIS) at the Leipzig Heart Centre which is one of the pioneering centres for MIS. It became clear, that following a close relationship with the surgeons at RPAH, an international collaboration with a focus on MIS would be advantageous to further develop this surgical technique. As a result, Martin commenced part-time work at RPAH in 2019 and now divides his time between Leipzig and Sydney. The close collaboration between the Leipzig Heart Centre and RPAH is based on clinical work, offering the whole spectrum of MIS, the education and training of



junior surgeons as well as the undertaking of clinical and basic research within an international network.

It is the strong belief of the Cardiothoracic Department that minimally invasive surgery and heart team decisions, where specialists from different clinical disciplines decide patient best treatment, will be the future and will be for the benefit of patients. Our collaboration enables us to teach, develop and evaluate these modern techniques as an international team who are at the frontline of cardiothoracic surgery.



PUBLICATIONS

ACS – Annals of Cardiothoracic Surgery

The *Annals of Cardiothoracic Surgery* is delighted to announce that its continued strong growth in the cardiothoracic surgery field has been reflected in a new higher **Impact Factor of 3.058** as released by Clarivate Analytics in their latest Journal Citation Reports.

This Impact Factor reflects ACS' ongoing and increasing value to the scientific community, confirming its importance as one of the leaders in the communication and advancement of academic research. ACS is thrilled with this achievement, made possible by the tireless efforts of our esteemed editors, authors and readers who continue to recognize the value of ACS' unique themed-issues through citations in their own work.

The ACS extends its gratitude to The Baird Institute and of course its generous supporters and to Royal Prince Alfred Hospital for their continued assistance, enabling the publication of outstanding submissions that contribute to the field of cardiothoracic surgery.

Visit <http://www.annalscts.com/>

Other Research Publications

For a full list of The Baird Institute's research publications, please go to our website at:

www.bairdinstitute.org.au/our-publications/



THE CONCOURSE
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Joanna Drimatis

SOLOIST
Alice Giles

Boieldieu • Harp Concerto
Tchaikovsky • Pathétique
Symphony

2:30pm Sunday 21st March 2021

HARP TO
heart



HARP TO HEART CONCERT

Sunday 21st March 2021

Musicus Medicus

We are working with Musicus Medicus (Latin for Musician and Physician) to promote a performance called "Harp to Heart" which will be held at The Concourse Concert Hall in Chatswood on 21 March 2021. Much of the proceeds from this event will go to The Baird Institute so we would love all of our supporters to join us.

Now in its seventeenth year, the NSW Doctors Orchestra comprises of around 80 medical students and doctors from metropolitan Sydney and regional NSW, who are also talented musicians. This annual fundraising concert promises to be an entertaining afternoon of inspiring music from French, Russian and Australian composers. It will feature guest conductor Joanna Drimatis, and star soloist Alice Giles playing the beautiful Boieldieu Harp Concerto in C major, Opus 77. The program includes the wonderfully passionate Tchaikovsky Symphony No. 6 in B minor, Opus 74 Pathétique, and a lively short work "Roar" by Australian composer Maria Grenfell.

Our Harp to Heart concert was originally scheduled for May this year. It was rescheduled to September 2020 and once again has been rescheduled to 21 March 2021 at 2.30pm. Please check our website www.bairdinstitute.org.au for updates and a link to ticket purchases. Tickets will go on sale in the new year.

VALE

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

- Graham Kemp - *husband of Lorna*
- Richard Rutherford - *husband of Beryl*
- Reginald Paget - *husband of Patricia*
- Colin Jones - *husband of Mrs Jones*



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.



Medtronic



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SEASON'S GREETINGS

For a full list of all research publications of
The Baird Institute, please go to our website
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 PO Box M85, Missenden Rd,
NSW, 2050

 02 9550 2350

@ info@bairdinstitute.org.au

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ABN 38 096 746 806

