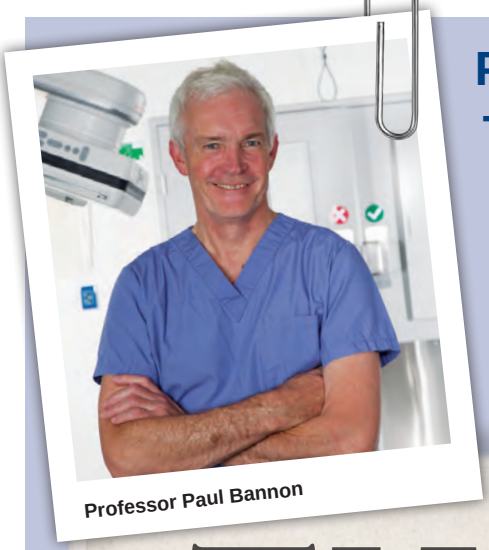
THE BAIRD INSTITUTE
Applied heart & lung surgical research

heart TO HEART

JUNE 2022



Professor Paul Bannon

PROFESSOR PAUL BANNON NAMED TOP RESEARCHER IN HIS FIELD

The Australian's Research Magazine

November 2021

In November 2021, Prof. Paul Bannon's talent and dedication was acknowledged by The Australian newspaper's annual "Research" magazine. Prof. Bannon was named the top researcher in the field of cardiology based on the number of citations for papers published in the top 20 journals in his field over the past five years.

THE NEWS

Not for many decades has the value of research been so clear. Less than two years after the appearance of a new and dangerous virus, and thanks to countless researchers in infectious disease, immunology, epidemiology and other fields, we now have many effective vaccines in mass production, and numerous tests and treatments for Covid-19.

In The Australian's annual Research magazine, we acknowledge the talent and dedication of our researchers. And again, as we have for the previous four years, we present The List – a roll call of the best researchers and the best research institutions in Australia in 250 individual fields of research.

We do this by teaming with talent discovery and research analytics firm League of Scholars to comprehensively scan online data about Australia's research output. It enables us to identify the best researcher and the best research institution in each field, based on the excellence of their research and the impact it has in discovery and scholarship.

This is a unique listing. Because it zeros in on the particular specialties of individual researchers and research institutions, it provides fine-grained detail and recognises countless areas of excellence which would otherwise go unnoticed in the public arena.

The 250 fields of research are divided into eight major discipline areas. In the magazine you will find listings of Australia's best researcher and research institution for all of the fields, classified by their discipline area.

But there's more. Not only do the data scans carried out by League of Scholars enable us to identify the best research in Australia, we can also identify the world's best. And by cross-checking against the Australian data we discover that in 15 fields an Australian-based researcher is first in the world and in 20 fields it is an Australian research institution that is world's best. Being able to claim 20 global firsts in 250 research fields is a testament to the quality of research in Australia.

This is an edited extract from The Australian's Research magazine

By Tim Dodd, Paul McCarthy

November 10, 2021

A NOTE FROM THE CEO

Dear Valued Supporters

How time flies by! I hope you have all been keeping well.

As briefly mentioned in the December newsletter, we are all very excited that Professor Paul Bannon, Chair of The Baird Institute and Head of Cardiothoracic surgery at Royal Prince Alfred Hospital (RPAH), was named the top researcher in Australia in the field of cardiology by The Australian Newspaper's 2021 Research Magazine. Such a notable achievement for someone who dedicates much of his time, outside of surgery, to research. An extract from The Australian Research Magazine in this newsletter explains how they arrive at their decisions on the top researchers in various fields of medicine.

You will note from the research updates in this newsletter, that we currently have a considerable focus on research into aortic disease and aortic surgery. Excitingly, we are currently in the process of recruiting a post-doctoral fellow who will lead a research team in basic and translational science focusing on aortic disease and human heart failure, under the mentorship of Prof. Bannon. This team will be a unique collaboration between the University of Sydney, The Baird Institute, and Royal Prince Alfred Hospital. The group will be headed by Professor Paul Bannon, Dr Sean Lal, A/Prof John O'Sullivan, and Professor Richmond Jeremy, who all hold dual appointments in the Faculty of Medicine and Health at the University of Sydney and at Royal Prince Alfred Hospital.

The fellow will lead a team that uses human and model system heart failure, to understand key disease processes in heart failure and aortic disease and will have access to highly sought after fresh human heart tissue biopsies from a range of cardiac diseases in the Sydney Heart Bank, at the University of Sydney. The value of this research group is that no other group has this biobank – the Sydney Heart Bank. If we have the serum as well as the tissue and we have the capacity to look at the genetic predispositions too – we are very well set up to do some ground-breaking research.

We expect that from this group there will be a number of high impact publications in top academic journals. The research of this group will be a great advancement for science. We don't even know how the aorta actually changes under normal circumstances at a molecular level and how that interacts with the heart, but with this research group we are in a position to look at this for the first time, using the resources that we have.

Finally, this year we celebrate our 21st birthday – 21 years since the establishment of The Baird Institute and how far we have come! On behalf of the Board and our research and administration teams, I would like to thank you for being a part of our journey over the last 21 years. None of what we do would be possible without your support and for this we are extremely grateful. Please keep November 17, 2022 free for our birthday celebration.

Catherine Rush

Catherine Rush
CEO, The Baird Institute

A NOTE FROM OUR PATRON

The Hon. Michael Kirby AC CMG

Reflections On Independent Research

The June newsletter of the Baird Institute carries interesting reports about the history of the Institute and some of the important research it has pioneered through the contributions of researchers, sponsors and supporters. At the time of this newsletter, we are adjusting in Australia to a change of federal government. Without commenting on the politics, we can rejoice that we live in a country where governments are changed periodically and peacefully by the decision of ordinary citizens.

Doug Baird and I both won Commonwealth scholarships at school. They were conceived by the Chifley Labor Government and implemented with enthusiasm by Prime Minister Menzies of the Coalition Parties. They strengthened Australia's universities by opening the doors to young people, like Doug and I, who were raised by parents of modest means.

In recent years, many universities, institutes and academies in Australia have felt that our federal government was hostile to funding them wholeheartedly and supporting original research. Doug Baird was not only a magnificent surgeon, he was also a dedicated performer in original research. This included research on topics without any immediate financial reward. Researchers, if they are rewarded at all, receive rewards a long way down the track. True to the memory and dedication of Doug Baird, The Baird Institute has been heavily engaged in research. The story is told in this newsletter. The recognition of its Chair, Professor Paul Bannon, as the "Top Researcher in the Field of Cardiology" acknowledges his research. In this, he and his colleagues are walking in the footsteps of Doug Baird.

Many people, including myself, hope that the incoming Government of Australia will cease hostility, sometimes evident in the recent past, towards independent research, universities, academies and research Institutes. We need to protect the funding and the independence of researchers. Only in this way will Australia remain in the first rank of global research, including in cardiothoracic specialties. I am proud that this newsletter records top drawer research, education and up and coming professionals. How proud Doug Baird would be of the Institute that bears his name. And of how top scientists whom he never knew personally, carry forward his legacy and inspiration

Patron, The Baird Institute

THE AORTIC RESEARCH GROUP

Dr Cassandra Malecki, BMedSc(Hons), PhD

Prof. Richmond Jeremy, FRACP; FCSANZ, FACC; FESC; FAHA; GAICD

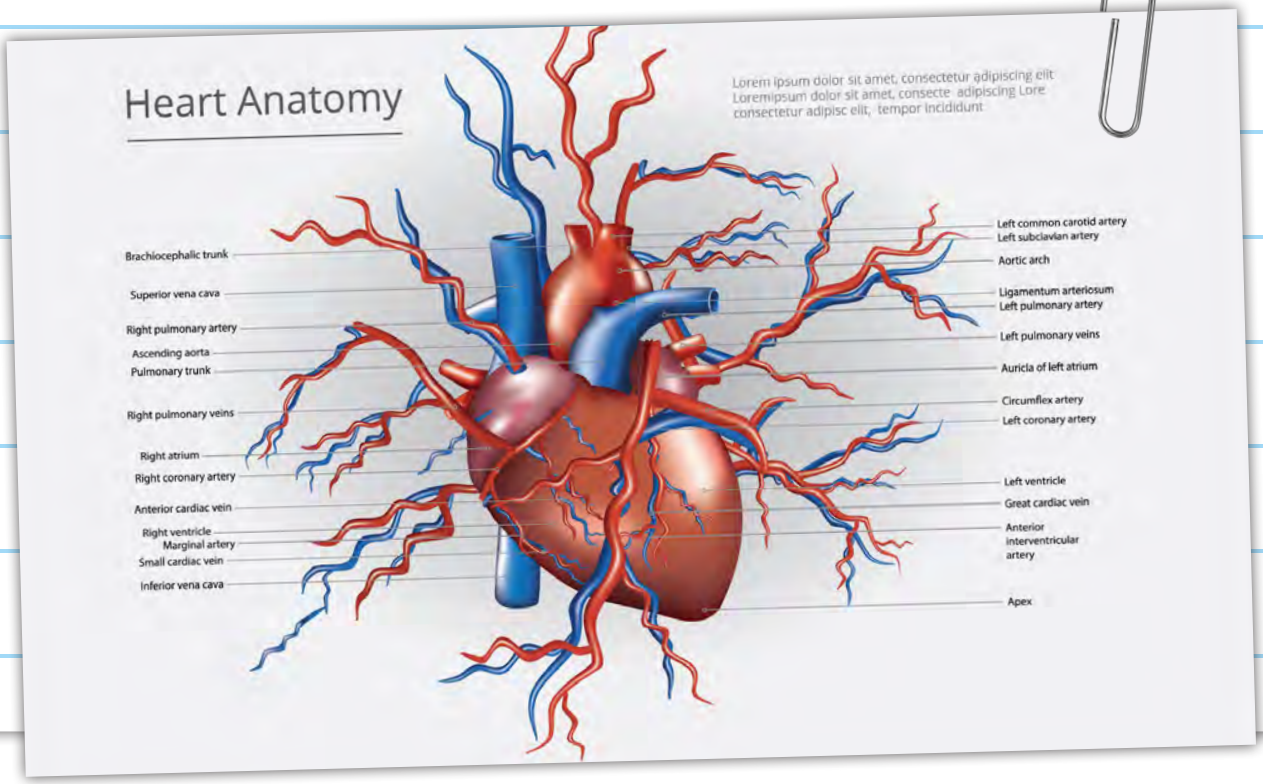
The Aortic Research Group, led by Professor Richmond Jeremy, undertakes both clinical and laboratory research into genetic causes of thoracic aortic aneurysms. Approximately 50,000 Australians, of all ages, have a genetic aneurysm, which are typically asymptomatic until the potentially fatal event of aortic dissection. Detection of affected individuals, understanding of clinical features and discovery of the cell mechanisms of aneurysm formation are key challenges.

The Aortic Group collaborates with the international Montalcino Aortic Consortium to discover new genes causing aneurysm, describe the clinical risk features and monitor the outcomes after surgical repair. The group also conducts novel laboratory research, underpinned by aortic tissue donated by patients undergoing surgery at RPAH for aortic aneurysms. This material is part of the comprehensive tissue collection of the Sydney Heart Bank. Currently, tissue from over 200 patients has been collected and cryopreserved, including patients with Marfan Syndrome (MFS), bicuspid aortic valve, Loey's-Dietz syndrome, familial TAAD and atherosclerosis. Additionally, blood samples from affected patients are included. The Bank is continuing to grow in scope and is a key resource for new research studies.

One current research focus is a study of how changes in regulators of reading of the DNA code affect severity of aortic disease. We have found that alteration of DNA coding inflammatory genes correlates with the severity of cardiovascular disorders in Marfan syndrome, and this work is being expanded to other genetic aortopathies. Other discoveries include altered expression of miRNA molecules. In human vascular smooth muscle cells, changes to the levels of these miRNAs have an effect on pathways essential to vascular smooth muscle cell function and therefore may be contributing to aneurysm formation.

Currently, large-scale analysis of aortic aneurysm tissue samples is underway to investigate over 4500 proteins and genome-wide RNA expression. These studies will shed light on the mechanisms of aneurysm formation, potentially identify markers of progression of aortic disease and also identify new targets for effective treatment intervention.

The Aortic Group also plays an important role in training the next generation of clinicians and researchers, with 3 PhD and 2 MPhil graduate research students and undergraduate medical students included in the program.



THE ROYAL PRINCE ALFRED HOSPITAL AORTIC TEAM

Professor Tristan Yan BSc(Med) MBBS MS MD PhD FRACS

Cardiothoracic Surgeon

It is fair to say that a Thoracic Aortic Aneurysm is a Great Masquerader. It can destroy any vessel to any organ in the body, with a single stroke. Of course, it can cause aortic rupture and death. This is the reason an 'aneurysm' has historically been perceived as the 'old demon' in the surgical literature.

The Royal Prince Alfred Hospital (RPAH) is a major referral hospital and is recognised for its excellence and innovation in aortic services.

The RPA aortic surgery program was initially set up by Professor Cliff Hughes, who was one of the first surgeons to do the Bentalls' procedure in Australia. The aortic program has since been strengthened and expanded under the leadership of Professor Paul Bannon, who is recognised internationally for his surgical expertise in aortic and complex root reconstructive surgery.

Vascular surgeons, Professor Jim May and Dr Jeff White were excellent surgeons and trainers of generations of surgeons in this country, who provided outstanding service at RPAH. They were responsible for the introduction of endovascular surgery in Australia, and both had outstanding international profiles in this discipline.

There has been a tremendous evolution in both cardiac surgery and vascular surgery over the years. There is a greater appreciation now, that when we are talking about treating any complex diseases, we need to get away from defining ourselves by the specialties that we are in, and really direct our focus towards how to treat the patient in the best possible way and to achieve the best patient outcomes.

There has been a trend to subspecialize within both disciplines to focus on "aortic interventions" and the task has fallen on the "Aortic Team" to explore both surgical and endovascular options for our patients in a collegiate multi-disciplinary team (MDT) environment. It really requires this MDT to review these complex cases together. At the MDT meetings, different pathologies such as thoracic or abdominal aortic aneurysms, aortic dissection, aortopathy and graft infection are discussed and various treatment options such as open, hybrid, endovascular and medical therapy are recommended.

With the introduction of endovascular aneurysm repair, using stent grafts has resulted in a major paradigm shift in the field of aortic surgery. It's true that the technical details and risk profiles vary greatly between the two, but the principles remain the same. A successful aneurysm repair depends on either open replacement or endovascular exclusion, with healthy segments of artery proximal and distal to the repair. In addition, aortic arch and visceral segments and chronic dissections, add layers of technical complexity to aneurysm treatment.

Even though endovascular repair has become the principal way of dealing with most aortic aneurysms, open repair remains an essential treatment in many circumstances. We consider open surgical treatment to be beneficial for those young patients who have good performance status for better long-term outcomes and for treating patients whose aortic disease has genetic causes. Finally, for those patients for whom previous attempts at endovascular repair have failed, surgical approaches to device removal and definitive repair are becoming increasingly necessary.

I had the privilege of learning under the guidance of Professor Aung Oo as his aortic fellow. He is a world-renowned aortic surgeon, particularly known for open thoracoabdominal aortic repair. Prof Oo was originally the head of aortic surgery at the Liverpool Heart and Chest Hospital but he moved to St Bart's, London to set up a second aortic centre in the UK. One of the most important lessons that I have learned from him is that you can certainly succeed with good colleagues and limited resources, but you cannot succeed with poor colleagues and great resources. You never hear him raise his voice and everyone listens to him attentively when he speaks. He recognises the importance of unified teamwork and that the key is to have a shared vision.

Indeed, a big part of this, is to build a team with a purpose and a shared vision. For us, this shared vision is to establish a thoraco-abdominal aortic (TAAA) program at RPA.

With that in mind, Dr Raffi Qasabian, Dr Stephen Llewellyn, our senior cardiac anesthetist, and I went to Barts Heart Centre, based at St Bartholomew's Hospital in the City of London, to see how their aortic service operates and functions. Over the subsequent two years, we also invited Professor Oo to Sydney to guide our RPA Aortic team, as it was very clear to us that the success of a TAAA program is very much dependent on the overall growth of the team.

We have now formed a strong RPA aortic team. The team consists of 2 cardiac surgeons and 3 vascular surgeons, specializing in aortic surgery; 5 cardiac anesthetists/perfusionists, 2 neuromonitoring anesthesiologists, and 2 cardiologists, specializing in aortotopathy and connective tissue disorders. We have monthly aortic MDTs and Marfan clinics. All aortic tissues are stored in the heart bank and we have the largest aortic database with more than 20-year follow up.

Together, not only do we need to train surgeons to master the craft of aortic surgery, but perhaps more importantly, we need to take one step further and train the future generation of surgeons on how to work together throughout their career.

REMEMBERING PROFESSOR DOUGLAS DOUG BAIRD, AM

Transcript of the Eulogy given by The Hon. Michael Kirby AC CMG at Douglas Baird's Memorial Service.

12 December 1995. Great Hall, University of Sydney

Doug Baird was too young to die. I know that it is seemly to accept the irreversible fact of death. But in Doug's case it is especially unacceptable. Sweet was his nature and notable his achievements. But his best years lay ahead. It is by the tragedy of his death that we, his family, friends and colleagues come together today to reflect upon his achievements. We honour and celebrate his life. But, inside, I rail against fate's cruelty. And most of you will do so with me.

I first met Douglas Baird when we were both under-graduates of this University. As often happened, his outstanding intellectual gifts also propelled him into student politics. Formidable indeed, in those days, was the power of organised under-graduate medicine. I sat with Douglas on the Board of the Sydney University Union. True to his egalitarian ideals and the upbringing by his mother he played a leading role in the amalgamation of the Union and the Women's Union. In the heady debates of student affairs and the tough factional deals common in those far-off days, we forged a friendship that endured through the decades which followed.

His First Class Honours B Sc (Med) and MB BS never went to his head. Yet he was proud of them. And he was deeply hurt when the University first awarded, and then withdrew, the University Medal from him allegedly for a miscalculation. When serving as Fellow of the Senate elected by the Under-graduates, I became his advocate in that cause, as well as his friend. It was to no avail. But that misfortune never warped Doug Baird's view of the University. He loved this place. It is entirely fitting that we should meet here to remember him. This was a centrepoint of his life, this Great Hall.

After under-graduate days we kept in touch through a would-be "secret society" of ex-student politicians. For me, Douglas Baird never seemed to change. True, the advent of Phillipa and his children, joys of his life, expanded his personal zone from that provided by his loving parents. True his professional accomplishments enlarged his considerable intellectual life. True also his country honoured him for his services to medicine in Australia and overseas. But his basic simplicity of character and loving-kindness remained steadfastly the same, enduring all.

The Sydney University Medical Journal for 1967 describes him when he was President of the Sydney University Medical Society. The anonymous reviewer in that Journal captured some of the paradoxes of his life. He was «forceful but not inflexible». A man of peace, he nevertheless worked in Vietnam with the Prince Alfred team at the time the review was written. And after surgery, he gave English lessons to local doctors and nurses. The reviewer commented:

> ***"It is characteristic of Doug Baird to fill his time so completely. It is also characteristic of him to undertake something requiring such zeal."***

Ahead of his time, Douglas Baird was noted, even then, as a

Professor Douglas Baird

frequent traveller to Singapore, New Guinea and Vietnam as part of the development of his medical career. Later he was to add India, Malaysia and other lands of our region. He once told me that the heroic surgery into which he was suddenly thrust at an early age, in Vietnam refined, under almost unendurable pressure, his surgical skills which were to become legendary.

That commentator of nearly thirty years ago recorded that he played bad golf and worse squash and tennis. Wise was Doug Baird to turn to creative gardening. Even at the end, he and Phillipa were planning a new garden together.

The writer of 1967 observed that it had been said of him:

> ***"It wouldn't be Doug without a panic."***

I read that assessment with initial surprise. But then the memories of our youthful endeavours together came flooding back: his urgent interventions in meetings and his sheer determination, persistence and insistence. His panics were, I suspect, very strictly controlled. When action was needed, this was a most resourceful and talented professional man: swift of action and with a steely determination.

I want to speak here for the thousands and thousands of patients of Douglas Baird. When my mother suffered a heart attack a decade ago I contacted him. Within hours he had seen her, reassured her and within days he had operated upon her. I will never forget how, in the middle of the long operation, he came out to reassure my father and me that all was going well. He was a gentle surgeon. He never lost interest in his patients. He understood their anxieties and the fears of their families. What a model he was for the best of medical practice that our country can produce. It is wrong that he will not be there, living into old age to offer his example, his instruction and his inspiration.

But in the extended lives of the multitude of his patients, including my mother and thousands like her, is a love for him, and a gratitude, which is enduring and which I, their surrogate, express on their behalf.

I hope that somewhere in this University, which he loved and served so well, a permanent corner will be found for a fitting memorial to Douglas Baird. Let it be a place of instruction in the Medical Faculty to remind young students of the very best in kindness and skill that this great University can produce. Let it be in the University Union, as an encouragement to the future leaders of our country who sharpen their talents and develop their confidence in student affairs. Let it be in the great hospital associated with the University where, despite the frustrations, Douglas Baird worked in surgery and health administration at the very highest level. Let it be somewhere in the Senate room

where he played his part in the governance of the University. Or perhaps in this Great Hall which thirty years ago first resounded to the applause of his high achievements, the promise of which he was to sustain and fulfil in full measure as long as he lived.

Or let it be in a garden of flowers that remind passers-by of a good man, a loving husband, son and father. A fine citizen. A true teacher. An exemplar of all that is best in a profession of faithful service to others.

So we rage against the dying of the light that has seen Doug Baird taken from us prematurely, painfully and so unfairly. But we, his friends, his patients, his colleagues, the nurses and other staff who worked with him, his fellow citizens, and his family raise our voices in praise of him and all his works.

For every precious day of life that has been given to my family and to countless others, we say our humble thanks. Through those days of so many people and their loved ones, Doug Baird lives on. We are here to mourn him, to give thanks for his life, to praise his memory and to say that we will never forget him.

Memories of Doug Baird

By John Hill, patient of Prof. Doug Baird and Baird Institute Donor

Like many people my first introduction to Dr Baird was in an ICU ward. I was 37, waiting for a spot on the operation schedule for an emergency bypass operation. My father had passed away at 51 so my family were beside themselves with worry.

Doug Baird came in and without lessening the gravity of the situation gave such an air of obvious competence and composure. As long as I gave up smoking, he would proceed and everything would be OK!

It was Ok, I recovered fully and returned to family, friends and work a new man.

I came across Doug Baird in groups we both attended on the North Shore and was aware of his huge involvement with Sydney University where I am an alumnus. His passing at such a young age was a huge shock.

I had no idea of what he had achieved in so many areas until his memorial service. The Great Hall at Sydney University holds 600 people. It was packed. We are not talking here about a media celebrity or a politician, just an outstanding man who had affected so many people's lives. Everyone had a story. The extraordinary eulogy from The Hon Michael Kirby really summed up the loss we all felt.

Many thousands of people now undergo heart surgery safely due to the pioneering work done by Doug Baird

GASTROINTESTINAL COMPLICATIONS FOLLOWING CARDIAC SURGERY - A RETROSPECTIVE ANALYSIS OF MEDICAL RECORDS

A Cohort Study Of 7900 Patients

Dr Phillippa Smith

Co-investigators: Dr Nicholas McNamara, Dr John Brookes, Dr Benjamin Robinson, Prof Michael Solomon, Prof Paul Bannon

This research was presented by Dr. Smith at the General Surgeon's Australia Annual Scientific Meeting on Friday 8 October 2021. Gastrointestinal (GI) complications following cardiac surgery are known to lead to significant morbidity and mortality. The objective of Dr Smith's research project was to examine the incidence of these complications and to identify the associated risk factors from patient data in the RPAH cardiothoracic surgery database. The identification of risk factors will allow for the development of a predictive model and early management algorithm.

Purpose/Introduction:
Gastrointestinal (GI) complications following cardiac surgery have been associated with significant morbidity and mortality. The pathogenesis of GI complications in this cohort is thought to revolve around splanchnic hypoperfusion, whereby the circulatory shifts during cardiac surgery greatly affect blood supply to splanchnic organs. These complications are difficult to diagnose for a number of reasons, including the use of sedation, vasopressors and analgesia, which mask symptoms and signs. This study sought to investigate the prevalence and risk factors for the development of GI complications post cardiac surgery.

Methodology:
A retrospective study was performed examining the prevalence and characteristics of patients who had GI complications following cardiac surgery at our institution over a 14-year period.

Results:
7986 patients were included in the analysis. 190 patients (2.4%) developed GI complications following cardiac surgery, and 32 (16.8%) of these patients died within 30 days of operation. Patients with these complications were 6.8 times more likely to die than those without. (95%CI 4.52-10.11, $p<0.0001$). The most common GI complication was GI bleeding (59), while intestinal ischaemia was most commonly associated with mortality (24). Eighty patients required surgical or radiological intervention, including laparotomy (36) or endoscopy (37). The risk factors for development of GI complications included age, smoking status, perioperative use of inotropes, cardiopulmonary bypass time, and reoperation.

Conclusions:
GI complications following cardiac surgery are uncommon; however, they are associated with high mortality and morbidity. The identification of patients at risk of these complications may provide a useful tool to reduce morbidity and mortality in this patient cohort.

9TH ANNUAL JAMES WADLAND NIGHT OF HEARTS

Saturday, 2 April 2022

The 9th Annual James Wadland Night of Hearts event was held at Jbiel Cuisine Restaurant in Kareela. This annual event is held by Natalie Zugec on the 2nd of April - the birthday of her late husband, James Wadland. James died from an aortic aneurysm 9 years ago and Natalie has worked tirelessly, since that day, to raise money for The Baird Institute's heart research program, so that others don't have to endure what she has had to. The event raised in excess of $8,000 bringing her total raised over her 9 years of fundraising for The Baird Institute to around $150,000. Such a tremendous effort and we thank Natalie for her dedication and support to our cause

21st BIRTHDAY

Save the Date

Thursday 17 November 2022, 5pm – 8pm

The Baird Institute was established in 2001 and so that means this year we celebrate our 21st birthday. A time for us to celebrate our achievements but principally to celebrate our wonderful supporters, without whom we would not be here to celebrate our 21 years. Invites will go out early September, so keep an eye out in your inbox or letterbox. Due to COVID we haven't been able to have any events for around 30 months now and thus we could not update you on our work, so we would love to see as many as possible come along.

HARP TO HEART Concert

NSW Doctor's Orchestra

HARP TO heart

Sunday 25 September 2022, 2.30pm

Verbrugghen Hall, Conservatorium of Music, Sydney

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 promise 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 has been rescheduled many times due to COVID but we are sure it will go ahead on 25 September this year. Tickets have not yet gone on sale but please check our website - www.bairdinstitute.org.au for updates. You could also register your interest in the concert

BOOKINGS

https://boxoffice-music.sydney.edu.au

Tickets

ADULTS	$50
CONCESSION	$40
CHILD	$30

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

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