



heart TO HEART

 THE BAIRD
INSTITUTE
Applied heart & lung surgical research

JUNE 2019

Greetings

Greetings to all our supporters and thank you for your continued commitment to our mission; *to foster research and apply science to improve the outcomes for patients facing heart or lung surgery.* Your generous support is very much appreciated.

We had a very successful afternoon tea and tour of the Hybrid Theatre research facility last December with many of our valued supporters in attendance. At the afternoon tea we farewelled our outgoing Patron, Professor The Hon Dame Marie Bashir and welcomed our new patron, The Hon Michael Kirby AC CMG.

This edition of **"Heart to Heart"** features a story on Professor Bannon and his robotics work. As the article outlines, research into image-guided robotic surgery and robotic automation is already well underway through collaborations with various stakeholders, including the SLHD and Royal Prince Alfred Hospital. Much of this exploration into new technology is happening in the Hybrid Theatre at Sydney University, which many of you visited last December.

This year, we are hoping to offer three research scholarships to those doctors working in RPA's Cardiothoracic Department. I will be able to update you on the research conducted by these scholarship holders in our next newsletter. I hope you enjoy reading **"Heart to Heart"** and many thanks for enabling us to perform life-saving cardiothoracic research. We could not do this without the support of each and every one of you.



Catherine Rush
Engagement Manger, The Baird Institute

LETTER FROM OUR PATRON

The Hon. Michael Kirby AC CMG

In December 2018, our greatly loved former Governor Dame Marie Bashir, relinquished her role as patron of the Baird Institute. It is a mark of her remarkable service and sense of duty that she was willing to add the obligations of patron to those of Governor that she discharged for a record term. The ceremony for the handing over of patron's duties took place in the historic Pavilion at RPA Hospital. It was addressed by Dame Marie, Professor Paul Bannon and me. It was a joyous occasion with large quantities of scones covered with cream and strawberry jam. I must admit that I was deeply shocked by the cream in a cardiology event. So far as I can recollect, this was a first! I can only put it down to a streak of madness that got into us on bidding farewell, as patron, to Dame Marie.



The event was preceded by an extremely interesting inspection and lecture in the adjoining Charles Perkins Centre (named for my old friend Charlie Perkins, a wonderful Aboriginal leader) where Professor Bannon explained the setup of the model Hybrid surgical theatre. To think of the skill and dedication of the medical team who work under the aegis of the Baird Institute in facilities like this leaves one with a sense of profound admiration and gratitude, certainly to a person like me who has undergone open-heart surgery. In my case this was performed in 2005 and my heart is still going strong. Speeches were made pointing out that the Baird Institute, after the example of its founder Doug Baird AO, combines the triple pursuit of surgical brilliance, intellectual rigour and loving care for patients.

Present at the December 2018 event were many wonderful former patients and their families. Like me, they are lost in admiration and appreciation for Professor Bannon and his team. I hope that those who can afford it will respond to the Baird Institute's call for a donation to support their midyear appeal. This is one medical organisation that keeps its administrative costs to an absolute minimum. The result is that the donations go straight into work towards achieving the mission of the Baird Institute. This is to foster research; to apply science to improve the outcomes for patients facing heart or lung surgery; and to increase access for postgraduate students from Africa and other needy continents who can come to Sydney to see a world-class Institute at work. An example to the world which must be shared because we have in common our human needs, mortal bodies and the continuous obligation to learn by teaching.



The Hon Michael Kirby AC CMG,

"Patron of the Baird Institute and graduate of the Baird/RPA School of grateful patients."



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THE BAIRD INSTITUTE THANK YOU AFTERNOON TEA

Friday, 14 December 2018

On Friday 14 December 2018, The Baird Institute celebrated the support of our donors with an afternoon tea and a tour of the Hybrid Theatre, the state-of-the-art research facility at the Charles Perkins Centre (CPC) in Sydney University. Along with many of our valued supporters, we had two very special guests in attendance; the previous patron of **The Baird Institute**, Professor The Hon Dame Marie Bashir and our new patron, The Hon Michael Kirby AC CMG.

Professor Paul Bannon gave an update to all those present and thanked our donors for their continuing trust and support;

“At this point in 2018, we are at a really crucial point in planning for the future. The Hybrid Theatre in the CPC in the University of Sydney, represents exactly what Doug Baird engineered in 1986 with his focus on the highest levels of care, education and research. The landscape today is different from the way it was 30 years ago, as are the challenges. The patients are 10 years older, coronary surgery has been replaced by high-risk multi-faceted issues, we now have a major aortic program fundamentally underpinned by research in genetics and advised by multidisciplinary teams, we have structural heart programs, which look at better ways to implant valves with less risk and less morbidity, we have minimally invasive robotic procedures and we are now starting to talk about artificial intelligence. Much of this work is made possible with funds provided by The Baird Institute and as such we are very thankful to our generous supporters for assisting us to fund this important work”





BAIRD INSTITUTE VIDEO

"The Heart of Research"

We have recently put together a video to explain to supporters and potential donors about the work of the Institute. Thank you to Natalie Zucec for sharing her story and outlining how heart disease has affected her life and that of her family. You can find the video on our You Tube channel at the following link: <https://www.youtube.com/watch?v=66boR4VG9hw&t=2s> or go to youtube.com and place **The Baird Institute** in the search box.

A GENEROUS BEQUEST

from the Late Mr Fred Nielsen

Fred Nielsen was born in Denmark on 7 January 1947. He trained as a chef and migrated to Australia in 1968 where he established and ran several successful restaurants. In his late forties he moved away from restaurants into wholesale when he purchased The Pasta Factory in Leichhardt, this business supplied cafes, restaurants and the public with Italian food products.

Fred was a very artistic man and designed and renovated several homes. He had a great sense of humour and a wonderful sense of adventure and was loved by many.

As a young man, Fred was diagnosed with heart problems and in 2004 he had heart bypass surgery at Royal Prince Alfred Hospital. He was very grateful to the doctors and to the hospital for giving him his quality of life back and so he decided, there and then, to leave his estate to The Baird Institute to assist in saving more lives through research and teaching. Fred passed away on 4 January 2016. He was 68 years of age.

We would like to take this opportunity to thank most sincerely Ms Julieann Botfield, the Executor of Mr Nielsen's estate, and her daughter Isabella, who were Fred's great friends. Julie and Isabella spent countless hours putting his affairs in order and for this we are very grateful.



MORE OPERATIONS DONE USING ROBOTIC SURGERY

Surgeons and robots team up in more hospitals

Associate Professor Ruban Thanigasalam and Professor Paul Bannon in the Hybrid Theatre, and in the arms of their robotic team mate



How do you take the skill of a top surgeon to the next level? You partner them with a robot. Robotic surgery is already happening, but don't worry - they're not on autopilot.

On a winter's night in inner city Sydney, a few hundred medical professionals sit in the cavernous dining room of a refurbished railway workshop. Their eyes are glued to a giant video screen where a prostate operation is being performed live from an operating theatre elsewhere in the city.

An unusual element of the procedure is that the surgeon is sitting metres away from the patient, his head buried in a console. From there he is controlling the spidery, metal limbs of a robotic surgical unit. The audience at this medical technology summit aren't necessarily surprised by what they are seeing; robotic surgery is already well established. But no doubt many conversations will be had later about where the technology might take us.

What's already certain is that the opportunities are transformative, allowing clinicians to look in new places for ideas. Research into image-guided robotic surgery and robotic automation is already well underway through collaborations with the Sydney Local Health District, robotic surgeons at Royal Prince Alfred Hospital (RPA) and the robotic surgery research unit at the RPA Institute of Academic Surgery.

Exploration of this new technology happens in what's

called the Hybrid Theatre. Buried in the deepest part of the University's Charles Perkins Centre, it looks like a pristine science fiction movie set where three pieces of technology dominate the room. The imposing-looking and named Artis Pheno x-ray/CT system moves with the fluidity of an industrial robot painting a car. Instead of a car, it moves around a patient as it delivers detailed 3D images even as an operation is happening.

Nearby is the robot surgeon, more correctly called the da Vinci Surgical System, with its robotic arms containing high-definition cameras and customisable instruments. Beside it is a control console with hand grips that the surgeon uses to control the robotic arms, moving them with super-fine precision. It also provides a detailed, internal view of the operation.

The Hybrid Theatre operates under the umbrella of Sydney Imaging, which provides a suite of preclinical and clinical imaging techniques at the University for leading-edge biomedical research. The Hybrid Theatre itself was purpose-built to accommodate robotic surgery and image-guided surgical technologies. Its level of sophistication presents opportunities that haven't existed in Australia before.

Looking very at home among the theatre machines is Professor Paul Bannon (MBBS '87 PhD (Medicine) '98). A highly regarded cardiothoracic surgeon, he holds many senior titles including Academic Director of the Hybrid Theatre itself. He is one of the people who brought it into existence to be part of the new biomedical research and surgical training precinct taking shape at the University.

“What we always do is try to work out some way of doing things better,” says Professor Bannon. “The surgical paradigm right now is minimal invasiveness. Robots are already helping us do that.”

Minimal invasiveness means faster recovery for patients with the added benefit of freeing up hospital beds. Associate Professor Ruban Thanigasalam (MS '08) is a urological and robotic surgeon, and an expert in using the da Vinci system (he also helped organise the technology summit mentioned earlier in this story), and he has seen the numbers.

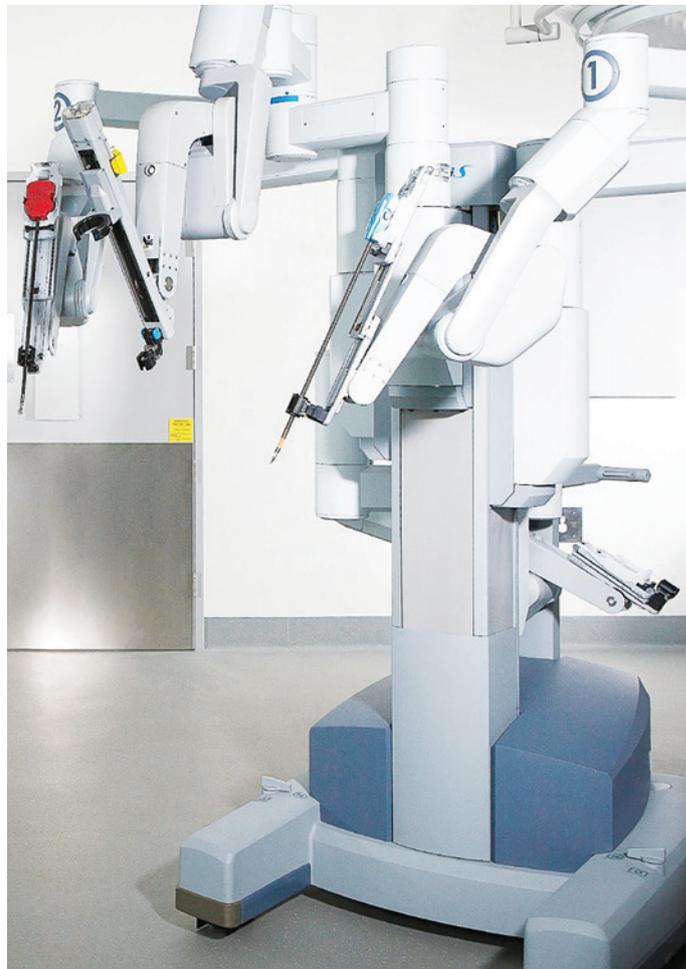
“For the last 100 prostate cancer operations we have performed across the Royal Prince Alfred and Concord Repatriation Campus, we found that robot surgery meant less blood loss, shorter hospital stays and less opioid usage compared to open surgery,” he says.

The da Vinci Surgical System is descended from robotic technology developed by the US military in the '80s and '90s that was designed to operate on soldiers on the battlefield. It has been used in hospitals in Australia since 2003. There are now six at the Royal Prince Alfred Hospital and on the University of Sydney campus, including in the Hybrid Theatre, which is the most advanced unit of its kind in the country. While robotic surgery is fulfilling its immediate potential, Professor Bannon, Associate Professor Thanigasalam and other clinicians working in the area are mapping out the technology's future, “The next question is whether we can go hands-off so robots operate by themselves,” says Professor Bannon. “Beyond that, can robots actually make decisions? We're in the process of learning what the machine can learn.”

If robots can one day make clinical decisions, it will be through machine learning which is related to artificial intelligence. Once provided with vast amounts of relevant information – in this case, the performance of countless surgical procedures – the da Vinci system has the capacity to work out how to do the procedures autonomously.

This is where humans may have to adjust expectations in being comfortable with a machine making clinical decisions. Though in some ways, this is already happening. Some pacemakers now have a robotic element that monitors blood chemistry and flags when treatment may be needed. People who have diabetes also benefit from semi-autonomous devices assessing glucose levels and making decisions about insulin doses.

“Though actually, robotic systems don't make decisions,” points out Professor Bannon. “They draw conclusions based on vast amounts of data that have been implanted. How far we can take this will be defined by the safety nets we put in place. And the safety nets



The da Vinci robot: The da Vinci console separates the surgeon from the patient, but adds an incredible level of precision.

will always be multi-layered and extensive.” While fully autonomous robotic surgeons are still some time off, Associate Professor Thanigasalam sees a variation happening sooner, “Robotics could act as a fail-safe by overriding a surgeon in case of error. Then within maybe 20 years, we'll likely see artificial intelligence within robotics,” he says.

Much more imminent is remote proctored robotic surgery. This is where a surgeon new to the technology in say, Wagga Wagga, can be supervised by a robotic surgeon in Sydney, and guided along the robotic surgery learning curve. With the horizons of robotic surgery widening, previously ambitious goals become achievable. As Professor Bannon says, “If you don't set objectives, you'll never know what's possible.” Certainly, the Hybrid Theatre is working towards becoming part of the global development of new technology in surgical robotics.

When SAM, perhaps clumsily, name checks the novel Brave New World to express the world-changing potential of the technology, Professor Bannon smiles widely and instead references a 1966 science fiction film where tiny scientists travel through a human body: “We think of it more as a fantastic voyage.”

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Written by Gabriel Wilder. Photography by Stefanie Zingsheim



ROBOTIC-ASSISTED THORACIC SURGERY

Dr Tristan Yan, cardiothoracic surgeon and his team have started the public thoracic da Vinci surgical system program at Royal Prince Alfred Hospital. The sophisticated robotic device gives the surgeon access inside the chest cavity through tiny incisions and provides improved visualisation, better access to mediastinal tissues and improved ability to remove lymph nodes as part of a cancer operation. Compared to surgery performed through a 20cm open-chest incision, robotic thoracic surgery provides several benefits for patients including; faster recovery and return to normal activities, shorter hospital stay, less pain, reduced scarring and minimal blood loss. Professor Tristan Yan, acquired the robotic surgical skills from the United States and is one of the few surgeons who can perform a robotic lobectomy in Australia.

Doctor Yan received the inaugural Slater & Gordon Mesothelioma Fellowship in 2008, from The Baird Institute, which enabled him to complete his Master of Surgery in 2010.

VANTARI VR'S VIRTUAL REALITY TOOL FOR SURGICAL PLANNING

An update

The Baird Institute's collaboration with leading Australian start-up medical technology company, **Vantari VR** is proceeding with promise since our update in the last newsletter. As previously mentioned, **Vantari VR** is developing Australia's first surgical planning tool specifically for Aortic Dissection in partnership with Professor Paul Bannon and his team. From a technological perspective, the final phase of the build is underway in addition to data gathering efforts, for this particular part of the build, through the ethics structures of our hospital partners. Dr Vijay Paul and Dr Nishanth Krishnananthan (co-founders of **Vantari VR**) have presented this technology at a number of Baird events over the last 6 months, showcasing the surgical planning technology possible for aortic dissections. In exciting additional developments, the utility of this cutting-edge technology has been further demonstrated by **Vantari VR's** work in the specialty fields of Orthopaedics, ENT, Urology and Breast Cancer Surgery. It is exciting to see The Baird Institute as a foundational partner, establishing a now flourishing technology mere months from the first announcement.





6TH ANNUAL JAMES WADLAND NIGHT OF HEARTS

Tuesday, 2 April 2019

The 6th Annual James Wadland Night of Hearts event was held at Café del Mar at Cockle Bay. 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 6 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 \$5,500.



FACEBOOK PATIENT SUPPORT GROUP

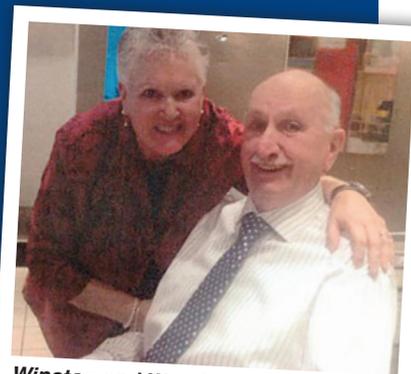
"One of the greatest gifts a person can give another, is support."

Heart to Heart is a heart surgery patient support program run by **The Baird Institute**, providing education and support to patients, families, carers and friends. If you would like to join Heart to Heart you can do so by going to the Heart to Heart Facebook page <https://www.facebook.com/groups/hearttoheartnsw/>

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.

- June Murray of Breakfast Point. Wife of Patrick.
- John Hellyer of Five Dock. Husband of Barbara. Passed away in March 2019.
- Kevin Cooper of Coonabarabran. Passed away in October 2018.
- Winston B Jones of Leura. Husband of Wendy. Passed away in May 2018



Winston and Wendy Jones



Professor Douglas Baird AM: A Truly Great Australian.
1940 - 1995

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