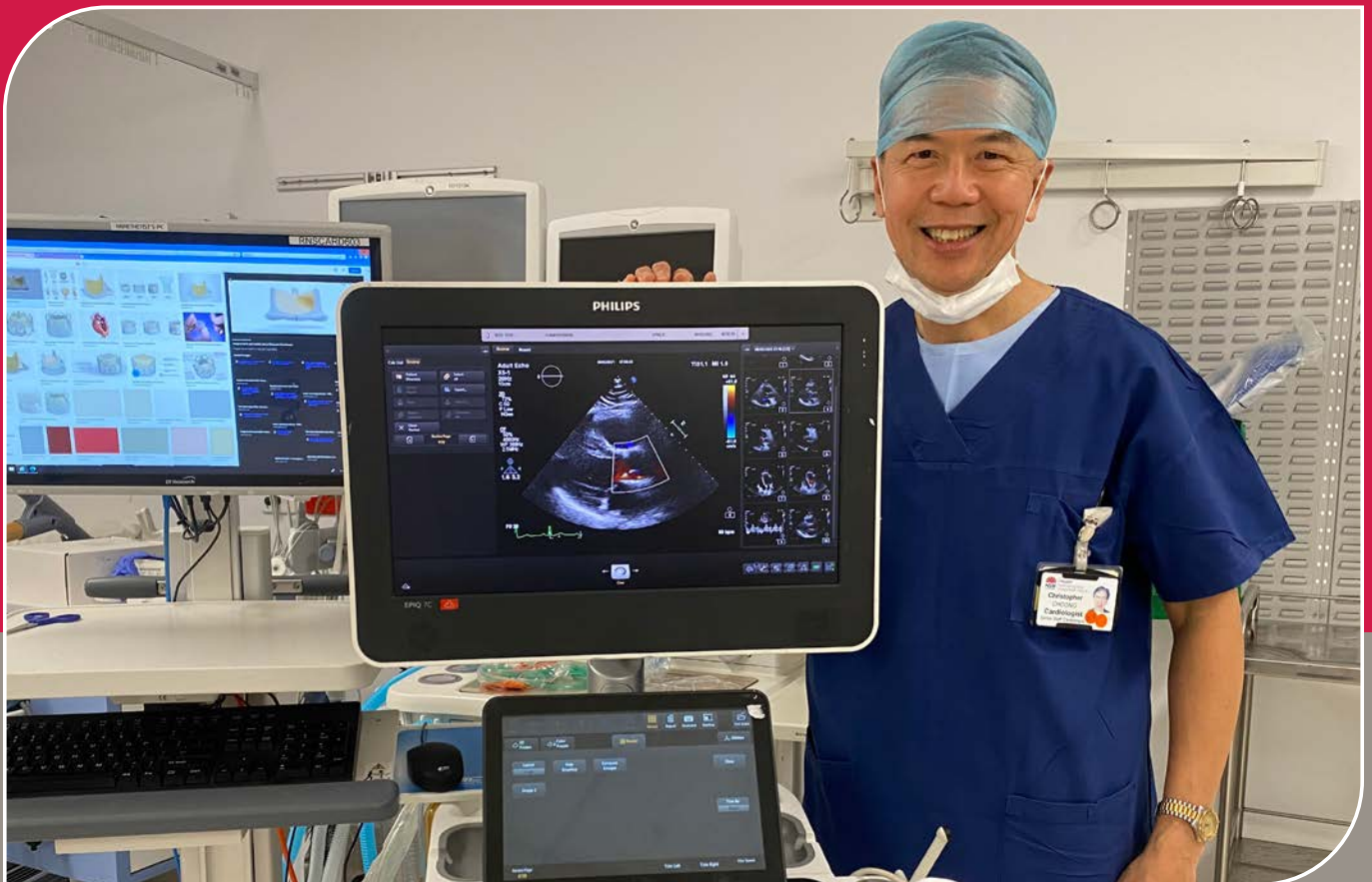
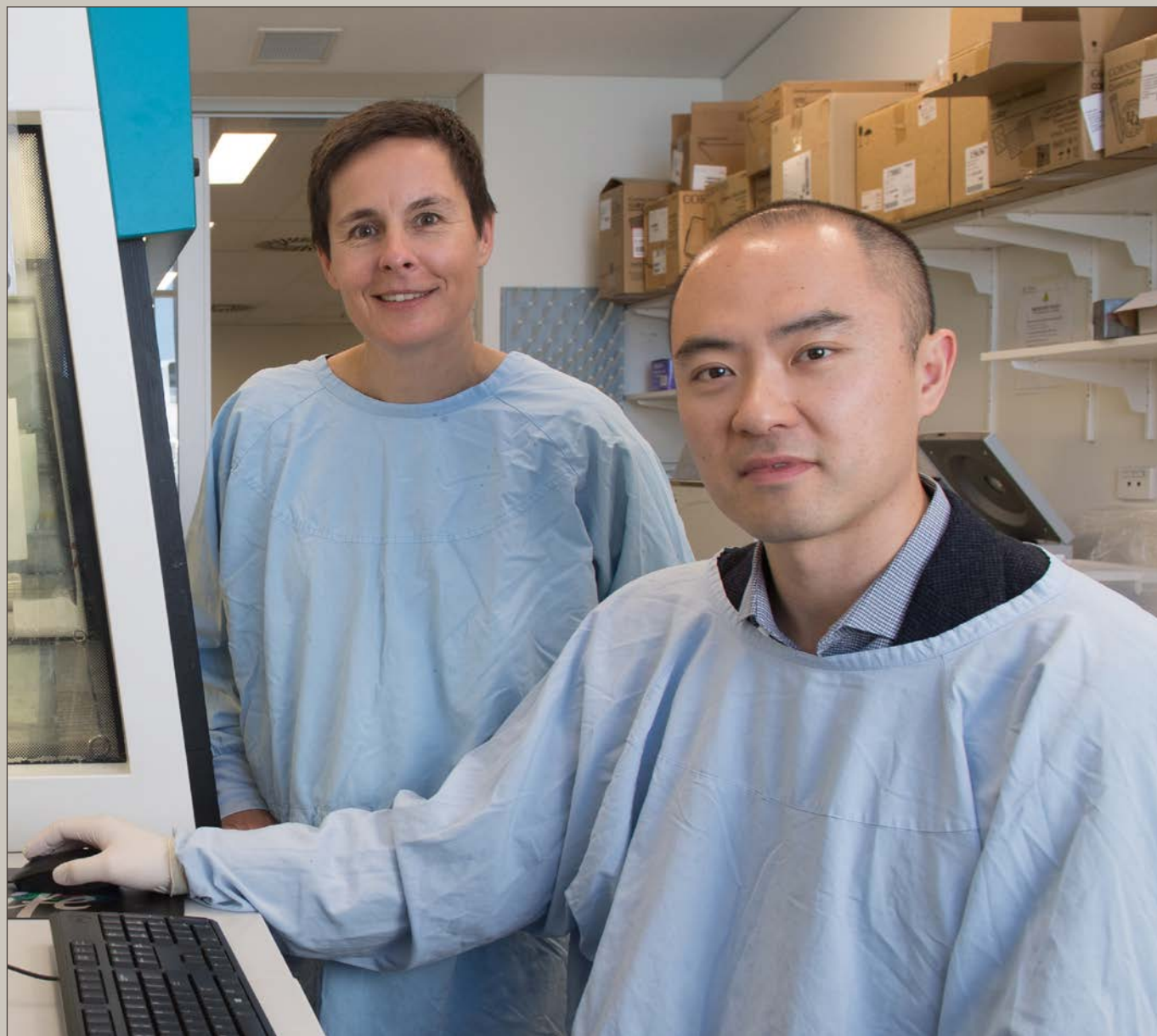


Research Saves Lives





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Message From Our Chairman



This year marks 11 years of me having the privilege of serving on the board of Heart Research Australia. For 9 of those 11 years, I have been Chairman.

Seeing the progress this small not-for-profit charity has achieved in this time is phenomenal. It has been brought about by the generosity of our donors, and the sheer hard work from our researchers, and our dedicated staff.

As our CEO Nicci Dent mentioned, this year, we have been able to fund just under \$1 million of research and equipment to help find breakthroughs into the prevention, diagnosis, and treatment of heart disease in this past year.

In addition to research, Heart Research Australia also focuses on partnering with patients and the general public sharing vital knowledge and education on heart health issues.

Through our REDFEB campaign, we shared almost 800 wallet cards highlighting the early warning signs and symptoms of a heart attack, and how they can differ between men and women, as well as creating 2 separate videos for men's heart health and women's heart health. We highlighted that aspects

of heart disease prevention, treatment and management can differ per person and can vary significantly for men vs women. Our messaging reached millions of Australian's with digital articles alone being shared with 54.5 million people. You can read more about this on page 16.

Our Heart Health Club offers much sought-after health advice from numerous heart health experts as well as support to those at risk of or suffering from heart disease. The club is also open to carers and family members. Our private Facebook group helps provide peer connection for those navigating what could be the biggest challenge they have encountered to date, providing much needed advice, reassurance, and visibility. The feedback from our members has been wonderful and we are proud to offer this much needed service to the community. Like most organisations, we have faced challenges this year due to the COVID pandemic, but we have continued to evolve and adjust our strategies to mitigate the threats and make the most of any opportunities we have encountered. In doing so, we have ensured the vital research continues to have a significant impact on heart disease.

I hope you enjoy reading about the work we have been able to achieve this year. Thank you again for your support.

A handwritten signature in black ink that reads "Tony Crawford". The signature is written in a cursive, flowing style.

Tony Crawford
Chairman

Message From Our CEO



Another year has flown by and it's wonderful to see life settle into a new version of normal. We've seen events re-commencing and our researchers are back in the labs working harder than ever to find medical breakthroughs into heart disease. We are excited to share some of these wonderful advancements and findings in our annual report for 2021/2022. One of the positive things the COVID pandemic brought, was a reminder as to the importance of health and wellness. Many are now working in hybrid models of work from home and in the office, ourselves included, and it's lovely to see this work life balance focus become standard practice now. Heart disease remains the leading cause of death in Australia and too many families and communities are devastated by it every day. To help fight this battle, information is key. Education for the community, to know what to look for, what to do and an all-round better understanding of heart disease for individuals as well as for our researchers. There is still so much more we need to delve into and understand about heart disease to create better prevention, diagnosis and treatments. This can only be done with research. Whilst the lab closures due to the pandemic impacted research, it gave many the time to review their data and write papers for various medical publications about their findings, extending their research knowledge to benefit medical professionals, and in

turn patients, around the world.

We are so proud to be able to share with you that in the past year, we have been able to fund just under \$1 million of research and equipment. This funding has been allocated to a number of different projects that will have a significant impact on the future of prevention, diagnosis and treatment solutions for heart disease.

One of the projects receiving further funding is Professor Gemma Figtree's BioHEART project. Professor Figtree and her team are looking at why there has been an increase from 11% to 27% in just a few years, of the number of people coming in for heart attacks and stents with none of the standard modifiable risk factors.

One of the breakthroughs they have found is the possibility of being able to use biomarkers to help predict heart attacks, which could help identify those at risk, but showing no current modifiable risk factors. In the future, these tests have the potential to foresee heart attacks for patients, leading to opportunities to treat patients earlier and hopefully prevent many heart attacks in the future.

An additional finding Professor Figtree and her team have found is a link between ticks and heart disease. For those people that develop an allergy to red meat following a tick bite, research has shown they have a 2-fold increased chance of having blocked arteries and unstable plaque which can lead to a heart attack. We are so truly grateful for the ongoing support of our donors through this uncertain and challenging environment. Without your support none of this incredible research or education we share would be funded. Together we are saving lives, and I hope you enjoy reading all the wonderful things we have been able to achieve this year.

Nicci Dent

Chief Executive Officer

Patient story – Jen O'Neill

“My second heart attack lit a fire in my belly. I need to get this message out there for other women.”

Being young and healthy, with no history of heart health issues or risk factors, might lead someone to believe that they themselves may never experience a heart attack, especially so early on in life.

This was the case for new mum Jen O'Neill, who at 36 suffered her first of three heart attacks. When she first began experiencing symptoms, Jen initially brushed them off, blaming it on the exhaustion and sleep deprivation of juggling having a 3-year-old, and breast feeding an 11-month-old baby. “After a particularly difficult day I was in tears talking my husband through my day when I got a pain at the side of my left breast. I thought, great, I'm getting mastitis. The pain travelled down my arm to my fingers, and I suddenly felt incredibly nauseous”.

With no family history of health issues related to heart attacks, Jen didn't think much of these symptoms. Thankfully, her husband would quickly piece together the signs and suggest she may be having a heart attack, and to call an ambulance. Like many others in this position, Jen hesitated when doing so,



“Please, please, listen to your body and be aware of the signs and symptoms of heart attack. Don't ever be afraid to advocate for yourself if you think you are having a heart attack.”

stating, “it was the shame and embarrassment of taking up a bed in hospital. You don't want to waste resources, you don't want to add to the already overflowing hospital system”. The danger within this thought process is what costs so many people valuable

time to help save their lives when suffering a heart attack and is something that Jen now aims to share the importance of.

After arriving at hospital, cardiologists told Jen she had suffered a sudden cardiac artery dissection (SCAD) and was extremely lucky her husband had picked up the signs and symptoms of a heart attack so quickly, ultimately saving her life. Jen was not only shocked that she had experienced a SCAD heart attack based on her lack of risk factors, but how little she'd heard these experiences discussed, particularly within women where the signs of a heart attack could

drastically differ from men. It's for this reason that getting involved in sharing the message that anyone can experience a heart attack is so important to Jen. The signs and symptoms of a heart attack should always be taken seriously, regardless of anyone's age, health situation or fitness level.

It's extremely important we normalise the discussion on not only what may happen before and during a heart attack, but also the experience after. Jen felt this

especially being a woman.

"I was comfortable in thinking the majority of people who have SCAD's usually only have one."

Unfortunately, in July 2020 during the midst of the COVID lockdown, at the age of 40 Jen experienced her second heart attack 4 years after her first. While at work she suddenly felt extremely tired, and a strong pain in her back. With this being a peak time within the pandemic, Jen feared she would be a burden on the system



was an area often neglected, and it wasn't until she got in contact with another woman who shared a similar experience that she'd learn some of the basic things people don't talk about happening to you after having a heart attack. One of the main things that surprised her was the impact taking blood thinners would have on her body,

and take up unnecessary hospital space during these times. She'd relate to the way many other women act when experiencing a heart attack, brushing off symptoms and not wanting to be a bother as

she felt she had a responsibility to not waste resources if it wasn't necessary. "It's just inbuilt in us all, this is just what happens, and you've got to break against the mould sometimes."

"I felt shocked the second time thinking now that I've had two it's more likely that I will have others".

This second experience ignited Jen's passion for ensuring all women know the signs and symptoms of a heart attack and what not to ignore, as these symptoms may differ from those men will experience. Jen stated, "the second one gave me more of a fire in my belly, and made me think, you know what, I need to get this message out there." Currently, it's not completely known why someone may experience a SCAD, which is why research is so important. However, it is known that predominately younger women are affected, and it could be linked to hormone or stress related issues. It's believed that in Jen's case, the accumulation of stress had taken a toll on her and was likely a driving factor in her SCAD heart attack.

Her experiences have led her to realise that heart health is an extremely important message to be shared and amplified, aiming to do so through telling her story to bring awareness of the subject to all individuals.

Jen O'Neill was an ambassador for Heart Research Australia's 2022 REDFEB campaign helping raise awareness for how the signs and symptoms of a heart attack can present for women vs men and encouraging women to listen to their bodies.

Our Work

About Us

Heart Research Australia was established in 1986 by concerned cardiologists at Sydney's Royal North Shore Hospital who recognised the pressing need to find new ways to reduce the high death rate and devastating impact heart disease has on families and the community. Unfortunately, although there have been some great improvements over the years, heart disease is still the number one killer of all Australians.¹



The Heart Research Australia team and some of their researchers.

Our goal is to reduce the devastating impact heart disease has on families and the community.

Our Vision

Making life saving breakthroughs in heart disease happen.

Our Mission

We support world class and emerging researchers to conduct ground-breaking research into the prevention, diagnosis and treatment of heart disease.

Heart Research Australia supports:

Seed funding

First-stage or 'seed' funding allows researchers to turn their innovative, 'out of the notebook' ideas into reality. First-stage research often does not qualify for government funding; therefore, it is with thanks to wonderful supporters like you who make the investigation of such ideas possible.

Your generosity gives researchers the opportunity to progress their ideas into research that could result in life saving medical breakthroughs. Your support also helps them progress their research to a point where they become eligible for larger, competitive grants from government funding bodies such as the National Health and Medical Research Council.

PhD students

Heart Research Australia provides scholarships for PhD students whose research is supervised by some of Australia's leading cardiac researchers. These scholarships play an integral role in nurturing and developing some of Australia's most promising heart health scientists.

'Bench to Bedside'

Most of our senior researchers are also practicing clinical cardiologists, which puts them in the best position to identify research opportunities and translate their discoveries 'on the bench' into benefits for patients 'at the bedside'. The breakthroughs they make contribute to and inspire the international body of knowledge on cardiac research.

¹ AIHW - Australian Institute of Health and Welfare (2022) Australia's health 2022: data insights, AIHW, Australian Government.

How do we differ from other heart organisations?

Heart Research Australia raises funds for innovative research into the prevention, diagnosis and treatment of heart disease.

Our **goal** is to reduce the devastation heart disease has on families and the community. Our **focus** on seed funding for cardiac researchers helps investigate new areas and supports our **aim** to make their work competitive for larger grants from national bodies, such as the National

Health and Medical Research Council.

Most of our researchers are practicing cardiologists based at Royal North Shore Hospital, which places them in the best position to translate knowledge from the 'bench' to patients 'at the bedside'. Direct patient interaction assists research and triggers new areas for investigation.

Bench to bedside has led to the

discovery that an increasing number of patients experience a heart attack with no traditional modifiable risk factors, such as high blood pressure, cholesterol, diabetes, hypertension or a family history of heart disease. This finding is currently being investigated by our researchers to identify new methods of diagnosis and early identification and treatment to better protect patients.

You can help us change the future of heart disease and keep families together for longer!

Our research needs your support to help make life saving breakthroughs.

The funds you donate help us support research into the prevention, diagnosis and treatment of heart disease and continue towards our vision of making breakthroughs in heart disease happen so we can keep families together for longer and protect future generations.

How you can show your support?

- ♥ Become a 'Heart Hero' regular donor
- ♥ Make a gift in memory or celebration
- ♥ Share your birthday by asking for donations instead of gifts
- ♥ Host a fundraising event
- ♥ Participate in our annual 'REDFEB' event
- ♥ Purchase a ticket in 'Play for purpose'
- ♥ Leave a gift in your Will – even small gifts can make a significant difference
- ♥ Become a Heart Research Australia Community Champion sharing your personal experience of heart disease to help others.



For more information visit our website heartresearch.com.au/support-us or call us on 02 9436 0056.

Highlights From The Year

The support from the community in raising funds and awareness for Heart Research Australia has been incredible and we are so appreciative of all their efforts. The COVID-19 pandemic has thrown numerous challenges to the not-for-profit industry creating uncertainty and changing the face of fundraising as we know it. The unwavering dedication from our passionate supporters in raising awareness and funds to change the future of heart disease, has been gratefully appreciated, and has enabled us to continue to support research and share much needed education to the community throughout the year.

The generosity of all our supporters is crucial to providing seed funding for our researchers and the next generation of young heart scientists, enabling them to continue their life saving research into heart disease. As this type of first-stage research receives little government funding, we are 100% reliant on community support for this work to continue.

This year, support from events and community fundraising has raised a grand total of **\$86,916** for Heart Research Australia. Without your dedicated support this amazing result would not be possible. Thank you.

Peak Body Health and Fitness

Peak Body Health and Fitness recently celebrated their 11th birthday. As part of their celebrations, they chose to run a fundraising event in memory of one of their personal trainers, Simon Atkinson. Simon was a fit and healthy young man who had been a personal trainer there for over 30 years. At 53 years old, Simon unfortunately passed away due to a heart attack earlier in the year, devastating the local community. Simon had helped so many people become the best versions of themselves by his kind nature, passion for health and training. His drive to always help others were just some of the many reasons Simon was such a loved member of the club and community. Peak Body Health and Fitness and Simon's family and friends raised **\$1,245** for Heart Research Australia in honour of Simon.



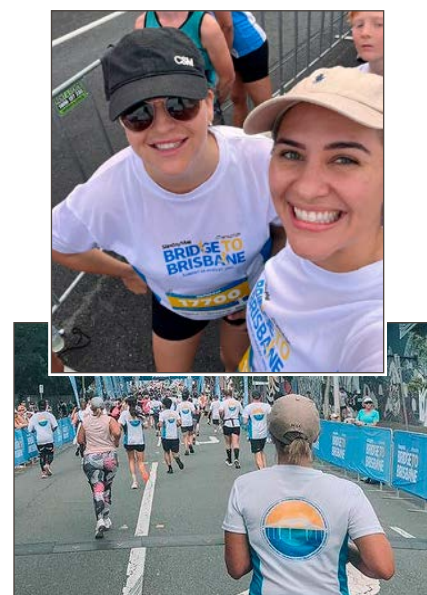
Bridge to Brisbane

When Emily was just 2 weeks away from giving birth to her first child, her husband devastatingly passed away suddenly from a combination of heat stroke and a blocked artery they were not aware he had.

To help raise awareness that heart disease can affect young people as well and isn't solely an older men's disease, she decided to run

the Bridge to Brisbane 10km fun run to help raise funds for Heart Research Australia.

We are so incredibly grateful for Emily's support in helping raise much needed awareness towards heart disease and funds towards the prevention, diagnosis and treatment of heart disease.



Crossing the heart of Australia – band night

On July 1 2021, Heart Research Australia board member Brigid Shute and her friend Rob Porcaro, embarked on a 750km trek across the Simpson Desert following the most challenging and remotest tracks, the Madigan line. The trek was estimated to take 25 days and cross over 700 sand dunes however unfortunately, amid the trek one of the support cars experienced a malfunction and the trek had to be stopped.

To further grow their fundraising efforts, Brigid and Rob organised an event to support Heart Research Australia, who had been impacted by the challenges of COVID19.

On March 25th, 'The Interceptors', a band featuring renowned guitarist Les Gock, played for a crowd of 100+ Heart Research Australia supporters for a fun night of classic rock at the Bridge Hotel, Rozelle.

A huge thank you to everyone who attended helping raise \$2,240 towards life saving heart research.

The final fundraising efforts for both the walk and the Interceptors event was an astounding \$8,843. We are so truly grateful to both Brigid and Rob, and to all those who generously supported them in this challenge.



Highlights From The Year *continued*

Heart Health Awareness for REDFEB

REDFEB is a community fundraising event run annually to help share vital heart health education with the community whilst raising much needed funds for life saving heart research.



Our 2022 REDFEB campaign focused on the impact Menopause has on a woman's heart health and promoted new resources that highlight the differences in heart disease symptoms, prevention and management for both men and women. Two new videos discussing heart health for men, and heart health for women, were created with Cardiologists Professor Ravi Bhindi and Dr Ashleigh Dind.

In addition, a heart attack wallet card which highlights the early warning signs of a heart attack as well as an action plan and how early warning signs can differ between men and women was distributed.

You can access the two new videos we created [here](#), and you can order one of our Heart Attack Wallet Cards [here](#).



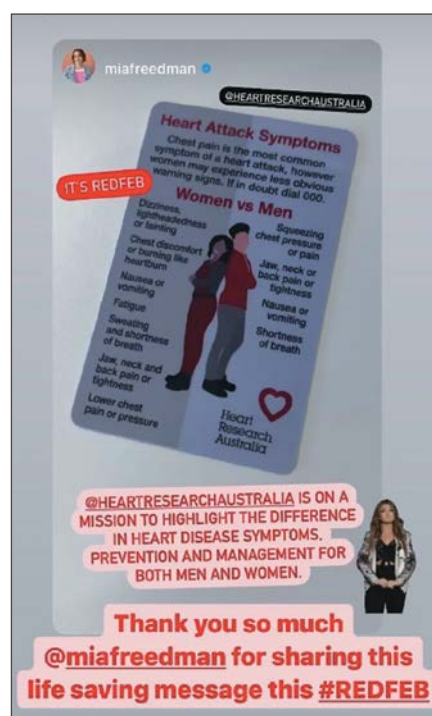
Seeing the events organised within the community and our social media filled with images of people wearing RED was so truly heartwarming. One of the many things we love so much about REDFEB is seeing the community come together for such a great cause and despite the havoc COVID-19 has created, this year did not disappoint!



In addition to the numerous individuals and organisations that shared images and videos wearing RED and supporting REDFEB on social media, we were so fortunate to have a number of media personalities and groups with large and influential social media followings support REDFEB.

MIA FREEDMAN

(CEO of Mamamia, Australia's largest digital media network for women - 226K followers) shared our Heart Attack wallet card to her social media community.



Author SALLY HEPWORTH

(29K followers) is not only one of New York Times bestselling authors but also a passionate advocate of Heart Research Australia. Sally shared a passionate video and numerous social posts throughout the month of FEB promoting the cause, calling out for donations and raising awareness of early warning signs for women. You

can see the video Sally Hepworth shared here www.facebook.com/watch/?v=667975487893489.



THOSE TWO GIRLS

Lise and Sarah shared a number of social media posts (following 30K+) raising awareness of the early warning signs women can experience when having a heart attack and promoting our Heart Attack Wallet card. In addition they interviewed our ambassador Jen O'Neill on their Podcast 'forty'. See pg 19 for more info.



ALISON DADDO

Author of Queen Menopause, used her social media platform (following 18K+) to help raise

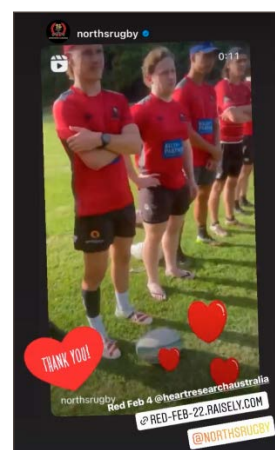


awareness to women of the impact menopause can have on a women's heart health.

The **NSW WARATAHS** (95.6K Instagram following, 170.5K Facebook



Following) and **NORTHS RUGBY** (instagram following of 5.7K) also showed their support of REDFEB on their social media platforms.



Highlights From The Year *continued*

The Man Walk Kiama

The Man Walk provides an opportunity for men to get together to walk, talk and support each other in a healthy way. They've been getting together every year for several years in support of REDFEB, encouraging

walkers to wear red, raising much needed funds and awareness for heart health. We are so grateful to all involved for their dedicated support every year.



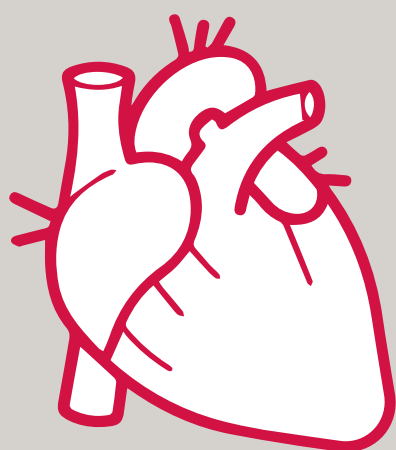
The Northern Beaches Sun Run



Heart Research Australia kicked off REDFEB with a team of supporters participating in the Northern

Beaches Sun Run, a 7km run from Dee Why to Manly raising a total of **\$2,567** for life saving heart research.



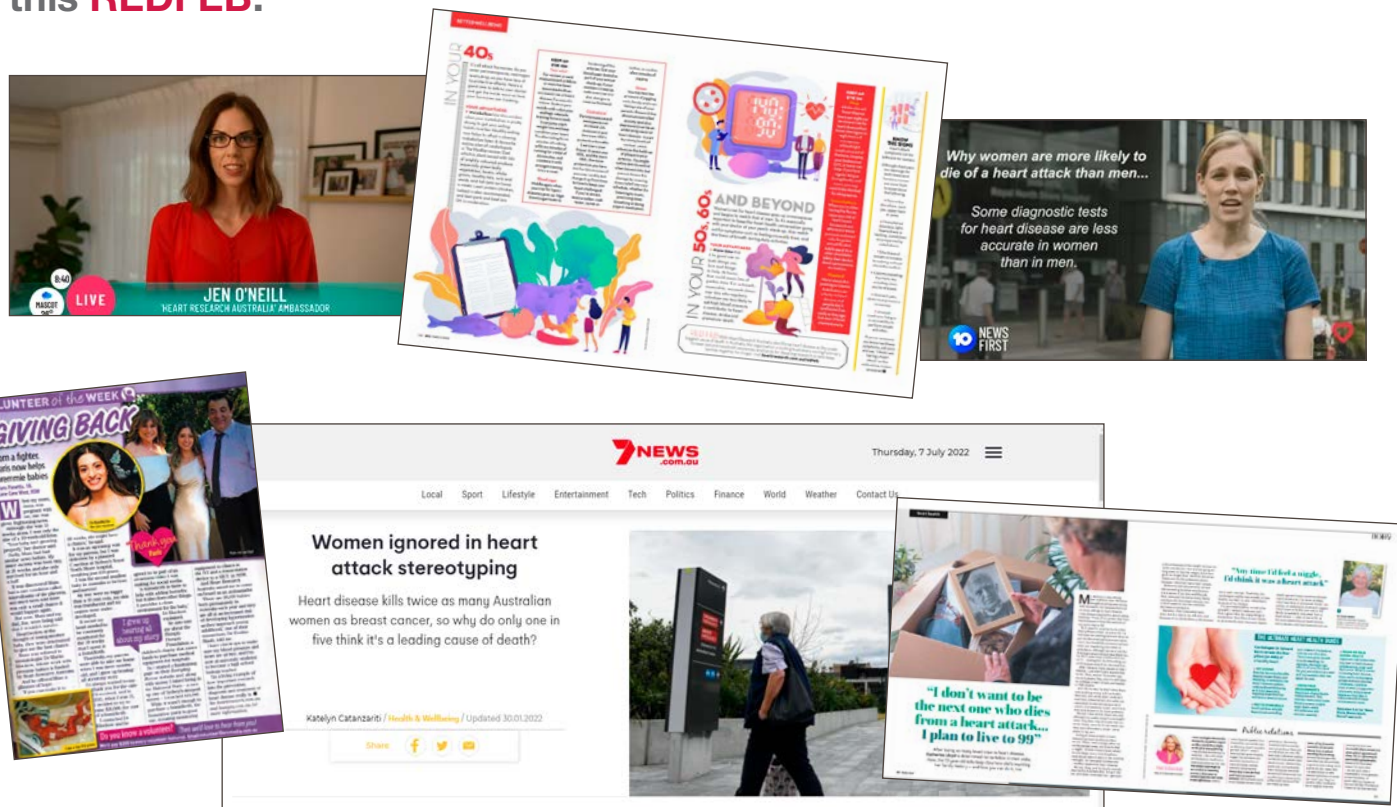


Heart disease is the
**SINGLE BIGGEST
CAUSE OF DEATH**
in Australia¹.

1. AIHW - Australian Institute of Health and Welfare (2022) Australia's health 2022: data insights, AIHW, Australian Government.

In the News

A huge thank you to the community and all the media outlets who helped us share the incredible work our researchers are doing and raise much needed awareness in the community about heart disease this **REDFEB**.



A huge thank you to the community and all the media outlets who helped us share the incredible work our researchers are doing and raise much needed awareness in the community about heart disease this REDFEB.

The response from the media regarding REDFEB 2022 was incredibly positive. With 7 TV spots, 15 print, 250+ digital articles, 1 Podcast feature, 20 Radio interviews and Radio news grabs, the support given to help share such a vital message was greatly appreciated.

To help raise awareness we spoke with various media outlets including Channel 7's Sunrise and the Morning show, Channel 10 news, Studio 10 with Tristan MacManus and Sarah Harris, as well as numerous radio shows, magazines and printed and

digital media articles to share our message during REDFEB.

Our spokespeople and ambassadors brought attention to heart disease being Australia's biggest killer with the numerous media outlets who supported us. They advocated for the importance of heart research and education whilst covering the risk factors and signs people should be more aware of when considering heart health.

The message of what the early warning signs of a heart attack are for men vs women as well as what to do should they arise was widely shared and we are so grateful to these media outlets for getting behind our campaign to share this life saving message.

Channel 7 Sunrise

REDFEB kicked off with Cardiologist Dr Ashleigh Dind sharing this life saving message on Channel 7's Sunrise.



The Morning Show

Heart Research Australia CEO Nicci Dent and Cardiologist Professor Gemma Figtree spoke with the team from the Morning Show.



Channel 10 News

Heart Attack Survivor Nathan King chatted with Amanda Hart from Channel 10 News to share his story experiencing a heart attack at 40, and talk about how his gym 5EF, and other businesses are using this time to get communities involved in helping fundraise for this year's REDFEB.

Channel 10 shed light on concerns for heart disease misdiagnosis due to the



difference in the experiences of heart disease between men and women. Promoting Heart Research Australia's new

educational resources and the importance of heart health education and awareness.

In the News *continued*

Studio 10

Heart Research Australia ambassador and heart attack survivor Jen O'Neill shared her experience with Sarah Harris and Tristan MacManus from Studio 10. Encouraging people to not dismiss the symptoms of a heart attack, especially aiming to reach women who are more likely to dismiss these early warning signs. She shared how REDFEB resonates with her, and why the research conducted by Heart Research Australia is so important and vital to the community.



Our vision at Heart Research Australia is to keep families together for longer and through REDFEB we hope to alert women and men on what to look out for if those early warning

signs arise so they can seek the urgent medical attention they need to prevent long term irreversible damage.

WIN News Illawarra with Heart Research Australia Ambassador Michael Williams and his brothers Ben and Tom.



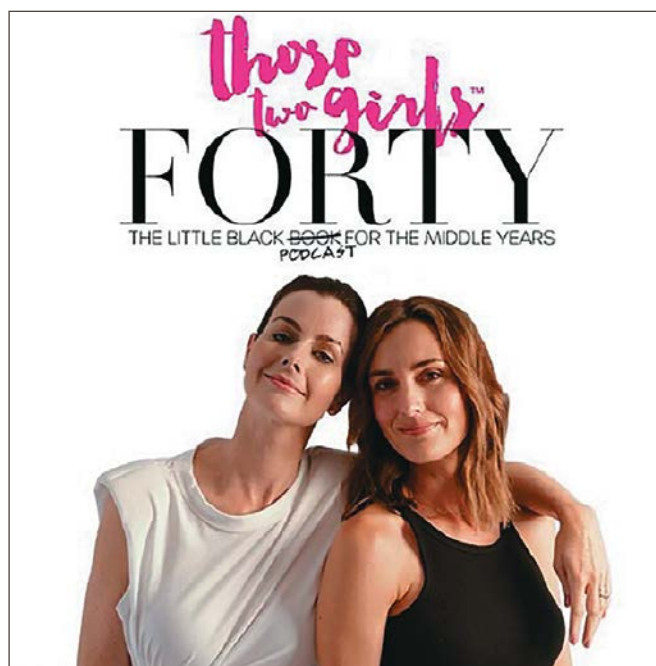
Channel 7 News with Cardiologist Dr Andris Ellims, CEO Nicci Dent and heart attack survivor Glen Hopper.



NBN News with Heart Research Australia ambassador Jen O'Neill

FORTY Podcast hosted by Lise Carlaw and Sarah Wills

Lise Carlaw and Sarah Wills host a podcast called FORTY - a podcast equivalent of a little black book for women in their middle years. They celebrate the life lessons and stories of popular Australian women in their fifth decade. For REDFEB, Lise and Sarah interviewed Jen O'Neill, Heart Research Australia ambassador and survivor of 3 SCAD heart attacks on the early warning signs women can experience when suffering a heart attack and what to do should they arise, as well as raising awareness that heart disease is one of the leading causes of death for women.



Community fundraising and participating in REDFEB is a great way to help make a difference to the future of heart disease and help protect the hearts of future generations.

What impact does your support to Heart Research Australia have?

The money raised by our wonderful community of fundraisers and the generous donations made by their family and friends;

- ♥ *Helps communities access information and resources*
- ♥ *Ensures our researchers have necessary laboratory equipment to assist their findings*
- ♥ *Contributes to building research projects dedicated to exploring new medical breakthroughs into the prevention, diagnosis and treatment of heart disease.*
- ♥ *Goes towards the funding of world class medical equipment*
- ♥ *Supports the next generation of heart researchers*

To see many more wonderful news articles and stories
from REDFEB 2022 visit

REDFEB 2022 Media - Heart Research Australia

Heart disease affects women too. It's time to talk about it.



Dr Ashleigh Dind wrote the following article on behalf of Heart Research Australia to help raise much needed awareness for women surrounding their risk of heart disease.

Many women aren't aware of heart disease risk factors.

Health campaigners have previously played on the caring wife and mother to increase the awareness of many health issues. But when it comes to heart disease, it is time for women to start looking after themselves.

Most Australians know that being overweight and smoking aren't good for your heart. Most Australians know that being diagnosed with high blood pressure, high cholesterol or diabetes increases your risk of developing heart disease. And it's true, high blood pressure is the single largest risk factor for cardiovascular disease. But for women in particular, there are many other risk factors that don't get the recognition they deserve.

Ischaemic heart disease (also known as heart attacks) is the leading cause of death in women worldwide. Yet most

Australian women don't realise that heart disease is something that affects them. Women are relatively protected from heart disease before menopause because of the high levels of oestrogen in their bodies. Oestrogen acts to reduce "bad" cholesterol (LDL), increased "good" cholesterol (HDL) and stabilise any cholesterol in the walls of the heart arteries to reduce the risk of heart attacks. However, after menopause - usually around the age of 51 - this protection suddenly declines. The cardiovascular risk profile of post-menopausal women then accelerates for 10 years until they have the same risk as men.

The National Vascular Disease Prevention Alliance created a heart disease risk calculator based on age, gender, blood pressure, smoking, cholesterol, diabetes and heart tracing. Doctors use this to decide if a patient's risk profile warrants

medication. But it's not the whole story - especially when it comes to women. It is not well known that what happens in pregnancy influences a woman's risk of heart disease for the rest of her life.

"Doctors should start asking and women should start talking about their pregnancies to better understand their heart disease risk."

High blood pressure and pre-eclampsia related to pregnancy increases a woman's risk of heart disease later in life. In a very large study of 1.3 million women in the UK over 20 years, women with pregnancy-related hypertension had double the risk of dying from heart disease. These women were more likely to develop high blood pressure outside of pregnancy and do so



at a younger age. Similar trends are seen with diabetes. Half of the women who have diabetes in pregnancy go on to develop diabetes in the next five to 10 years. And it's not just women that are affected - babies of mothers with pregnancy-related high blood pressure and diabetes are more likely to be obese or develop diabetes themselves.

Having a baby that is growth-restricted or premature also increases the likelihood of a mother having heart disease later in life. But none of these pregnancy-related factors are routinely considered when

doctors calculate heart disease risk. Doctors should start asking and women should start talking about their pregnancies to better understand their heart disease risk.

Heart Research Australia raises awareness in the community about heart disease, and this year the focus was on heart disease in women. We are encouraging women to speak with their doctor and share their pregnancy history to better understand and manage their risk of heart disease.

Heart Research Australia is so grateful for the generous

donations we receive from the community that helps us support groundbreaking research into improving the identification, prevention and management of heart disease in Australia, especially among women.

Heart disease in women doesn't get the publicity it deserves, it's time to change that.

Dr Ashleigh Dind is a cardiologist at Royal North Shore Hospital and an honorary medical director of Heart Research Australia.

Our Heartfelt Thanks

Thank you for helping us make breakthroughs happen. Every gift and donation we receive gets us closer to much needed life-saving breakthroughs to help keep families together for longer.

Gifts in Wills to help the hearts of future generations

Heart Research Australia is incredibly thankful to the men and women who help make our research possible through a gift in their Will. A large portion of our research is funded in this very special way. Last financial year, Heart research Australia received **\$1,272,180** by Australians who remembered us in their Will.

Our wish is for a future free of heart disease, there is still a long way to go but as we've seen, research done in the past decades has led to life saving developments in heart research. Donations from Gifts in Wills, no matter how large or small, are invested in innovative heart research projects so our researchers can transform their ideas into life saving treatments that will continue to benefit future generations. A gift of 1% in your Will, after loved ones are taken care of, will help reduce the devastating impact heart disease has on families and the community.

We would like to give special acknowledgement to our 'Breakthrough Partners'. This very special group of people have told us that they have left a gift in their Will to Heart Research Australia. We love to hear if someone has made this decision, so we can thank them and keep them informed of the work our researchers are doing. Of course, we are also incredibly thankful to those who prefer to keep their decisions private.

*A gift of
just 1% in your will
can help us save lives*

Regular Giving

We are so grateful to all our generous donors, as we navigate these hard times. We are especially grateful to our "Heart Heroes" - who choose to donate monthly. COVID has impacted our funding but knowing we have set funds available every month gives us the security of income, so we can guarantee that our research projects continue. The quicker we find cures for heart disease the more lives are saved.

Many of our wonderful monthly donors have been donating to us for over 30 years – so their impact on advancing understanding and improving outcomes for heart disease patients is immeasurable. So, a big thank you to all our monthly donors – we couldn't do it without you!

In Memory

We wish to acknowledge and thank the many families who have chosen to create a gift in memory in lieu of flowers this past year when going through the pain of having a loved one pass away from heart disease.

It is an emotional and stressful time for families and communities when a loved one passes away, and we are truly grateful to the families who chose Heart Research Australia as an option to honour their loved ones and share a donation towards heart research allowing the memory of their loved one to help others in the future.

The death of a family member or friend is one of the most difficult experiences to go through. For some people, making a donation in their memory can be a positive and special way of honouring their life. If this is ever something you may have to consider then there are a few options like setting up a **tribute page**, donating online or via special in-memory donation envelopes.

In memory of the late:

Anonymous

Clive Morton

Mrs Domenica Parisi

Dr Emily Matters

Hamish Wilkinson

Karl Beddely

Kevin Wilhelm

Simon Andrew Atkinson



Remembering Hamish Wilkinson

Hamish Wilkinson was only 27 when he suffered an aortic dissection and passed away devastating his family, friends and colleagues.

Heart Research Australia joined his family and friends at Hamish Wilkinson's memorial as they shared loving stories of Hamish who loved a birthday celebration, a story, a chat, horses, and was larger than life.

“In amongst our tears there is plenty to smile about, Hamish saw the joy in everything and it's a lesson for us all to remember. Never waste a moment to tell someone you love them.”

Helen Wilkinson (Hamish's mother)

Preferring to be 30 minutes early for work than one minute late, Hamish was incredibly devoted to his role at NSW Health earning the respect of all his colleagues. His joy for life and ability to connect with anyone will leave a gaping hole within the community.

A memorial has been placed outside the NSW Health office in Hamish's special place where he loved to sit and enjoy the sunshine while greeting anyone who passed by and eating his lunch.

A truly beautiful and loving family who raised an incredible man have had their hearts broken irreparably. Devastatingly, we hear stories like this daily and every time we do, our hearts break a little further. Whilst we're working as hard as we can to change the future of heart disease it just never seems fast enough.

Heart Research Australia is truly beyond grateful to the family, friends and colleagues of Hamish who generously donated \$3,380 in his memory to help our researchers search for breakthroughs into the prevention, diagnosis and treatment of heart disease.

Thank you for entrusting us to continue the legacy of Hamish. We are truly grateful and will continue to work as hard as we can to reduce the devastation heart disease causes families and the community.

Vale Hamish Wilkinson, you are one very loved man.



Volunteers

Heart Research Australia would not be able to do the work we do without the help of all our wonderful volunteers. We are so grateful for all the help they have given us over the past year. Our volunteers help in a number of different ways. We have many Community Champions who support us by sharing their experience with heart disease with the media in order to help us raise awareness. We have Cardiologists who provide expert information to media channels to help us raise awareness amongst the community and throughout REDFEB. In addition, we have been fortunate to have a number of interns from UNSW volunteer with us through the year.

We are so truly grateful to all these selfless individuals, for donating their precious time, sharing their skills, and helping us keep families together for longer - their care, generosity, dedication and flexibility never cease to amaze us.

Lachlan Schereck



Lachlan Schereck undertook a research project delving into our core demographic to help us better understand and tailor our communications to our audience. It has been an absolute joy to have Lachlan join our team as a part of his university course and the work that Lachlan completed for us will help us tailor our strategies

over the next few years. Instantly connecting with the team despite a hybrid working environment of working from home and the office, Lachlan's presence will be missed. We are truly grateful for all he has done working with us and we wish him all the best for his career ahead.

Samantha Spy

Samantha joined us as a component of her Bachelor of Design and Media studies and has excelled in all she completed for us. Her design and copy writing skills were beyond her years and we are so excited to see what she does once she completes her university studies. Sam added just so much value to the team and hit the ground

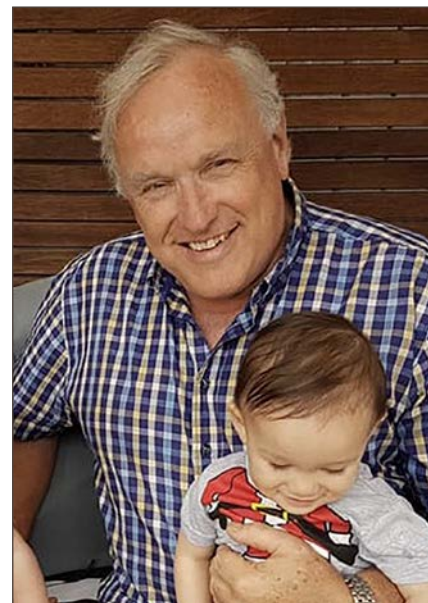
running, achieving so much in the time she has been with us, significantly helping our constantly growing workload. We truly enjoyed working with Sam and we will all miss her being in the office with us on Thursdays! We are so grateful for all the incredible work Sam achieved and wish her all the best for the future.



Chris Russell

Chris Russell is one of Heart Research Australia's ambassadors and volunteers and has been sharing his incredible skillset with us for many years, helping us share vital education and research knowledge to our supporters. Chris Russell hosts our Heart Health Club 'Tea with the Experts' webinars and interviews our heart health experts in a light-hearted way, helping to draw out and share our expert's knowledge in an easy-

to-understand way. In addition, he is often the MC for many of our events and also shared his time to speak on our Men's Heart Health Video we created this year. Chris adds humour, knowledge, and enjoyment to every event he is involved in, and we are truly beyond grateful for all he does for us. He is a highly valued member of the Heart Research Australia team, and we thank him for all he does to support Heart Research Australia.



Harrison Gourlay

Harrison joined us for an internship as part of his Bachelor of Media (Screen and Sound Production) Degree. He was a great support in liaising with participants of our REDFEB campaign and did

some great script writing and wonderful video content for us during his internship. We are so grateful for Harrison's support during his time with us and wish Harrison all the best for his future endeavors.



Hea Singh

Hea is a year 12 school student currently completing her Duke of Edinburgh. As part of her service to the community she has been assisting Heart Research Australia in general admin tasks saving us a significant amount of

time and we are so truly grateful for her support. Despite juggling exams and assessments, she is always so helpful and generous with her time and a true delight to work with.



Corporate Supporters

Heart Research Australia is so thankful to the following corporate supporters and their teams. Their significant support helps fund our researcher's life-saving work and upcoming breakthroughs. Thank you for helping us keep families together for longer.

Abbott Vascular

Heart Research Australia are so grateful for the ongoing incredible support from Abbott Vascular. As the supporting partner for our REDFEB campaign yet again this year, Abbott Vascular helped us share vital life-saving information about heart attacks to the community, helping educate people on the early warning signs of a heart attack and how they can differ between men and women.

This knowledge will encourage people to seek medical attention



sooner if they suspect they are experiencing a heart attack saving long term damage done to the heart muscle.

Without the ongoing support Abbott Vascular has provided to Heart Research Australia, REDFEB would not have been the success it was, and we are beyond grateful to them for their ongoing dedicated support. In addition to being the supporting partner for REDFEB, Abbott Vascular is also

supporting the BioHEART program through a grant for the Clinician Research PhD Program. In this way Abbott is contributing towards the BioHEART program and its development of biomarkers for early risk identification as well as the potential identification of new pathophysiological pathways and novel therapeutic targets for coronary artery disease.



Ormeggio, Chiosco and a'Mare



Alessandro Pavoni has been an ambassador for Heart Research Australia for a number of years now, a partnership we are truly so appreciative of and grateful for. Together with his wife Anna Pavoni, they own Ormeggio at the Spit, Chiosco and a'Mare.

They consistently support Heart Research Australia by donating a dinner for 20 at Ormeggio and other generous prizes of their gorgeous venues to our Charity Challenge Golf Day and other events.

We are so appreciative of both him and Anna for sharing their personal stories, promoting the importance of heart health and for their dedication and continuous support for us each year.



The dedes Group

Year after year the dedes group continue to support Heart Research Australia and we are overwhelmingly grateful to their generous contributions to prizes throughout the year. Their ongoing support every year provides a significant contribution to helping Heart Research Australia fund life saving heart research.



ZOLL

ZOLL generously donated 2 of their life saving AED defibrillators to our REDFEB 2022 campaign. The defibrillators were gifted to those who raised the most amount of funds for Heart Research Australia as a part of our REDFEB event.

The winners were Savanna Energy, Oil and Gas Services and Shumack Dental.

Shumack Dental raised **\$1,235** in donations for REDFEB, winning one of the defibrillators and generously choosing to donate this to their local club Collingullie

Glenfield Park Football Club.

A huge thank you for all the wonderful support from everyone involved!

Savanna Energy, Oil and Gas Services were able to win one of the defibrillators donated by ZOLL, raising a total of **\$2,166**. Heart Research Australia is incredibly grateful for everyone involved for taking the time to not only raise awareness of heart disease, but also raising the much needed funds for life saving research.



Shumack Dental



*Savanna Energy,
Oil and Gas Services*

Corporate Supporters *continued*



Moore Australia have been supporting Heart Research Australia for the past three years

by auditing our accounts pro bono. We are so truly grateful for their support and allowing us to

focus our efforts and funding on the prevention, diagnosis and treatment of heart disease.

Holman Webb Lawyers

Holman Webb Lawyers have been supporting Heart Research Australia for almost 20 years by offering pro bono legal support. A long-term partnership we are

so truly grateful for. Their ongoing support allows us to focus our time and funds on funding medical breakthroughs in the prevention, diagnosis and

treatment of heart disease and we are incredibly grateful for this relationship.



Giving the Gift of Life at Work

Thank you to everyone who supports our life-giving research through workplace donation programs. Every year more Australians embrace this tax-effective mode of regular giving with donations to Heart Research Australia through their payroll from their pre-tax pay, thereby reducing their taxable income. Some employers also match donations made by employees, doubling the impact of their support.

Workplace or payroll giving is an easy and effective way to support pioneering heart research. It provides a reliable income stream to more effectively fund lifesaving heart research to prevent, diagnose and treat heart disease – Australia's biggest killer.

To learn more or get involved visit:

www.heartresearch.com.au/workplace-giving/





 **157** people
are admitted to hospital every
day because of a heart attack³

1,000,000 Australians
are currently affected by
heart disease⁶

3. Australian Institute of Health and Welfare 2020. Coronary heart disease. Canberra: AIHW

6. ABS National Health Survey: 2020-21

Our Research

Keeping families together for longer through life saving heart research

Heart Research Australia focuses on funding research which identifies new ways to prevent, treat and diagnose heart disease, Australia's leading cause of death. Ongoing COVID-19 restrictions have placed challenges on researchers, but they have still made considerable progress to help keep families together for longer.

This report features just some of the many inspiring projects our researchers are working on. To read more about the work our researchers are doing visit <https://www.heartresearch.com.au/our-researchers/> sign up for our newsletter, and follow us on social media to stay up to date with the latest research and news.



Why research is so important

Heart disease kills one Australian every 30 minutes¹. Despite major advances in the understanding and treatment of heart disease, there remains a large gap in our knowledge. Without further understanding of the disease, its diagnosis and treatment, families

will continue to lose their loved ones to heart disease each year.

Research is imperative to shift the current status quo of heart disease and reduce these devastating statistics.

1. Australian Institute of Health and Welfare 2021. Deaths in Australia. Cat. no. PHE 229. Canberra: AIHW

Research Projects



Chair of Cardiology - Professor Helge Rasmussen

Professor Helge Rasmussen divides his time between working as a clinical cardiologist and leading a team of researchers in molecular and cellular medicine. A particular focus of his research is learning how heart cells work. This has led to discoveries that could mean better treatment for heart failure and other forms of cardiovascular disease. Professor Rasmussen's work includes studies directed at understanding regulation of the cardiac Na⁺-K⁺ pump. His science research has led to paradigm shifts in understanding this regulation and other areas of cardiology.

Novel Treatment of Pre-eclampsia

Project Title:

Report for "Re-purposing of Beta3 Adrenergic Receptor Agonists as a Novel Treatment of Pre-eclampsia".

Lead Researcher:

Professor Helge Rasmussen

Maternal and neonatal mortality is a global public health problem, that leads to about 295,000 maternal deaths every year during pregnancy and childbirth, and 5.2 million deaths among children under five years of age. It remains one of the few fatal complications of pregnancy in industrialised countries today. In contrast to other diseases, the field has not progressed significantly despite the massive global burden it represents.

The placenta is the interface

between mother and fetus, regulating immune mechanisms, nutrient and oxygen exchange, and the production of hormones essential for pregnancy. Pre-eclampsia (PE) and intrauterine growth restriction (IUGR) are characterized by abnormal growth of the placenta, resulting in hypoxia/reoxygenation. These changes generate high levels of oxidative stress, reinforcing changes in placental function. This led to an increased release of the antiangiogenic factor, soluble Fms-like tyrosine kinase-1 (sFlt-1) and reactive oxygen species (ROS, mainly superoxide produced by NADPH oxidase) into the maternal circulation. Once in the blood, these toxic molecules circulate from placenta to endothelial cells

throughout the mother's body. Eventually, endothelial cells of target organs (e.g. the kidney and liver) suffer localized oxidative stress and cell death (apoptosis) increases.

Through this study, the cardiologist team found that an increase glutathionylation of placental Na⁺-K⁺ pump of a specific cytosine residue (Cys 45), of the $\beta 1$ Na⁺-K⁺ pump subunit (GSS- $\beta 1$), inhibits the pump activity in cardiac myocytes, endothelial and smooth muscle cells. Therefore, glutathionylation on the specific Cys 45 residue on the $\beta 1$ Na⁺-K⁺ pump subunit (GSS- $\beta 1$), will cause inhibition of cardiac myocytes, endothelial cells and muscle cells that are needed to circulate blood around the body. Since placental

Research Projects

ischaemia is associated with the accumulation of ROS, which causes oxidative stress, they hypothesise that the subunit (GSS-β1) will be increased in PE placentas

Earlier studies have so far proven their hypothesis, with high levels of GSS-β1 was found in PE placentas in comparison to those of normal pregnancies. They proved that glutathionylation of the Na⁺-K⁺ pump in PE and IUGR placentas, due to the inhibition of the Na⁺-K⁺ pumps from GSS-β1, has disrupted the uteroplacental transfer of nutrients. Further indicating SS-β1's effect on placental insufficiency.

Treatment found during studies that The NADPH which is

derived from the oxidation of O₂ has been found to GSS-β1 as well as GSS-eNOS. The cardiology team found that GSS-β1 induced Na⁺-K⁺ pump inhibition and GSS-eNOS induced eNOS inactivation can be targeted pharmacologically. Reporting that in vivo treatment on hyperglycemic with the β3-AR agonist, CL316,243, reverses the inhibition of the Na⁺-K⁺ pump and in doing so, finding that CL316,243 treatment reduced GSS-eNOS and GSS-β1, reversing the Na⁺-K⁺ pump inhibition in cardiac muscles, therefore, the β3-AR agonist is likely to be beneficial in treating ischemic placental diseases.

Project goals consist of repurposing β3-AR agonists

(already FDA-approved for overactive bladder treatment) offers the prospect of rapid translation into improved care of 'high-risk' pregnancies with PE and/or IUGR and enhanced future maternal cardiovascular health. This project will initially address two broad aims:

- 1.** Confirm protective effects of CL316,243 against oxidative stress-induced protein glutathionylation and sFlt-1 overproduction in a human placental cell line
- 2.** Determine if CL316,243 reverses placental protein glutathionylation and amino acid transport in human placentas obtained from PE ± IUGR and isolated IUGR pregnancies.

Preventing cardiac side effects from breast cancer treatment

Project Title:

Preventing cardiac side effects from breast cancer treatment.

Lead Researchers

Professor Helge Rasmussen

One in eight Australian women will be diagnosed with breast cancer before the age of 85. With an average diagnosis age of 60 years, many will have a long unadjusted life expectancy. Breast cancer-specific deaths

have declined due to improved diagnosis and treatments but only with the penalty of long-term side effects, mostly cardiovascular, from radiotherapy and/or chemotherapy.

Some cancers overexpress FXRD3, overexpression of FXRD3 protects cancer cells from anticancer treatments, particularly radiotherapy. Serious cardiac side effects of any cancer treatment are common and the risk of it must be considered

early in the development of any new treatment. Breast cancers are treated with doses of radiotherapy, and as the heart lies directly under the breast, the heart can also receive doses of radiotherapy, increasing risk of heart attack and coronary artery disease.

After radiotherapy, some studies report the collateral cardiac damage of radiation and increase in death from heart disease almost offsets

4 simple steps to a healthy heart

*The **4-M** approach*

1. Move

Keep moving at any age and fitness level

2. Meals

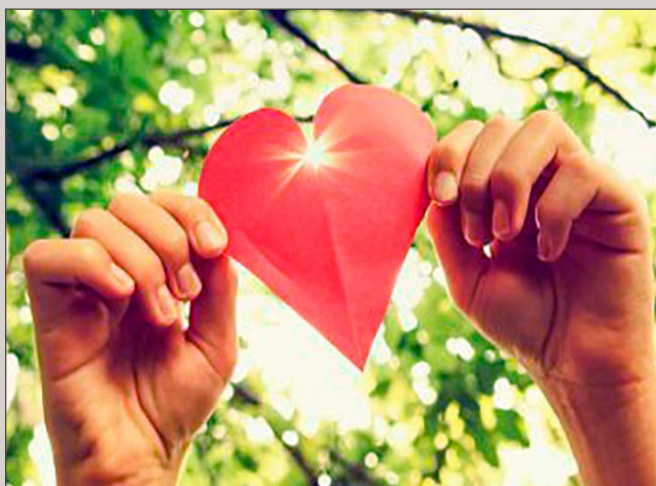
Eat intelligently

3. Measure

Keep track of your health

4. Mental Approach

Stay optimistic



Read more about the steps here: heartresearch.com.au/heart-disease/simple-steps/

the decrease in breast cancer-specific deaths. Our compound (FXYD3-pep) is derived from FXYD3 and can replace it in cancer cells. However, unlike FXYD3, FXYD3-pep does not protect the cancer cell from the anticancer treatments, that is, exposing cancer cells to FXYD3-pep eliminates the protection the FXYD3 protein itself gives.

In a novel approach to reduce heart muscle damage, Professor Rasmussen and his team have developed a small protein molecule (peptide) that greatly increases the sensitivity of cancer cells to the radiation, while its effects on the heart cells is much less pronounced.

The objective of Professor Rasmussen's project is to test if this new peptide can reduce or eliminate the risk of heart failure induced by radiation for cancer treatment, without decreasing the effectiveness of the radiation in treating the cancer. The team's test tube studies have found that the effectiveness of radiation was increased when the peptide they've developed was applied to the cancer cells.

Professor Rasmussen and his team have previously treated two types of breast cancer cells in cell culture with FXYD3-pep, one type overexpresses FXYD3, the other expresses little FXYD3. When they gave FXYD3-pep to the cells that have little FXYD3,

they saw no enhancement of the effect of anticancer drugs. However, when they put the FXYD3-pep drug onto breast cancer cells that had high levels of native FXYD3, they were able to kill most of them with 9 times less anticancer drug.

The next stage of the project is determining the optimal dose of FXYD3-pep, the timing of administration; determining the optimal radiation dose for tumor reduction and finally performing the combination therapy.

Professor Rasmussen would like to thank the donors for their crucial support of basic fundamental research.

Research Projects

Discovery of new mechanisms for coronary disease



Project Title:

Discovering new mechanisms and early markers of coronary artery disease - The BioHEART Study.

Lead Researcher:

Prof Gemma Figtree

Cardiovascular disease remains the greatest health burden for Australia and has an enormous social and economic impact across the globe. Despite common perceptions, it is not all solved. There is an urgent need for the development of an improved clinical pathway for management of coronary artery disease (CAD) patients who are suffering heart attacks, despite having no standard modifiable risk factors, and the need for novel biomarkers for early detection of CAD.

Professor Gemma Figtree and the BioHEART team have been successful in establishing a cardiology biobank for biomarker discovery, which has grown into

a large multi-centre study and is continuing to expand nationally. Together, the team has created an extremely powerful, secure, and user-friendly platform to discover and validate markers of early atherosclerosis and cardiovascular disease risk. A unique strength of BioHEART is banked cells from patient blood relevant to unravelling dysregulated signalling pathways.

Using the state-of-the-art platform, Professor Figtree and her team have profiled many thousands of human samples providing multiple large datasets that are now being used for the identification and development of biosignatures for CAD. Studying this data has provided the team with the ability to make causal inference about specific metabolic pathways and therefore select the optimal biomarkers.

Through the BioHEART project, Professor Figtree and her team have identified that those who develop a meat protein allergy after receiving a tick bite have an associated 2-fold increased chance of having obstructive CAD. There is also an association with unstable coronary plaque and events and is more frequent in STEMI heart attack patients than those with stable CAD, and is substantially higher than those with no CAD highlighted on an angiogram. These findings may

have substantial implications for individuals exposed to ticks as well as helping reduce heart attacks.

The international biobank created by Professor Figtree and her team has also enabled them to perform the largest Genome-wide association study of lipidomes. By integrating lipidomics and genomics, they have been able to identify some genetic variants associated with lipid series that are thought to be connected to CAD and atherosclerosis. This data is publicly available to researchers nationally and internationally, rapidly evolving the landscape for research into heart disease. Understanding and identifying these genetic associations with heart disease can enable researchers all around the world to develop new approaches to improve outcomes in patients with coronary artery disease.

Professor Gemma Figtree and her multi-disciplinary team wish to say how tremendously grateful they are to Heart Research Australia donors and thank you for your generosity in supporting their pioneering efforts to improve cardiovascular health. Heart Research Australia's support has greatly contributed to the successes of the BioHEART program, supporting groundbreaking scientific research, core staff and critical functions.

Improving differentiation between Myocarditis and Myocardial Infarction to improve patient outcomes



Project Title:

Improving differentiation between Myocarditis and Myocardial Infarction to improve patient outcomes.

Lead Researcher:

Dr Ashleigh Dind

Dr Ashleigh Dind's latest research is focused on better understanding the difference between myocarditis (inflammation of the heart muscle) and myocardial infarction (commonly known as a heart attack). For these conditions, it's essential correct diagnosis is made swiftly as urgent intervention is required, and treatments differ.

Over the past 3 years Dr Dind and her team, based at Royal North Shore Hospital, have been recruiting patients who either presented with myocarditis or myocardial infarction. Valuable

results were gained using the peak level of their blood test named 'troponin' and the severity of heart dysfunction and scar on their echos and MRIs.

This testing found that both myocarditis and myocardial infarction patients present with chest pain, a rise in their troponin levels, and often ECG changes. If the patient is having a myocardial infarction, then time is critical as the blood supply has been cut off to the heart, and an angiogram is required immediately to restore blood supply. In myocarditis, the patients do not gain benefit from an angiogram, and therefore could be subjected to complications. This procedure will do nothing but rule out infarction, an MRI is the best test to diagnose myocarditis, however cardiac MRIs are not usually available urgently.

Dr Dind aims to identify surrogate markers that can differentiate myocarditis from infarction to avoid invasive testing. Patients undergo a blood test confirming troponin levels and an echo promptly after presenting to hospital, so any additional information to help identify myocarditis could help avoid the risk of unnecessary invasive testing. Conversely, if this information showed the patient

was actually having an infarction, clinicians could expedite their angiogram and reduce any risk of further damage done to the heart.

The next step in Dr Dind's research is to use Echolnsight (strain) software, funded by Heart Research Australia, to analyse the patients' MRIs and echos. Strain is a way to measure dysfunction that cannot be seen with the naked eye. Prior research predicts that the inflamed areas of the heart (seen in LGE and MRI), will produce abnormal strain measurements. By assessing for regional abnormalities instead of global abnormalities which are often subtle, it can show a distinct difference between patients with myocarditis and myocardial infarction so patients can avoid invasive and unnecessary tests in the future.

Research Projects

Does mammary artery inflow improve graft potency in Coronary Artery Bypass (CABG)



Project Title:

Does mammary artery inflow improve graft potency in Coronary Artery Bypass (CABG)

Lead Researcher:

Dr Levi Bassin

Coronary artery disease represents an enormous burden of disease in the general population which has resulted in coronary artery bypass surgery evolving into one of the most commonly performed surgical procedures globally. However, because of its success, it remains largely unchanged from when it began 40 years ago. This surgical procedure usually involves bypassing vessels on the surface of the heart, which have significant narrowing. By grafting new arteries or veins onto these blocked ones, a new blood flow is created to the heart to reduce the risk of heart attack, angina and improve survival rates. The most commonly used grafts

are the Internal Mammary Artery (or IMA), which can be found behind the chest wall, or in veins from the leg. While this procedure is effective and durable for complex coronary artery disease, there can still be a significant proportion of patients, up to 10%, whose grafts fail in the first year following the operation, meaning patients have to undergo further treatment.

Practicing cardiothoracic surgeon, Dr Levi Bassin, has received funding from Heart Research Australia for a project which looks at ways to improve this life-saving procedure. Dr Bassin and his team are undertaking a randomised study over the next 2 years, of over 140 patients who are undergoing coronary artery bypass surgery at Royal North Shore Hospital. They will compare how open their grafts are after 1, 5, and 10 years and if this correlates to whether the graft is placed off the aorta vs off an IMA. They will also be assessing the flow characteristics within the arteries at the time of surgery, by using transit time flow measurement (TTFM). This uses ultrasound technology to assess the blood flow and flow characteristics through a coronary artery bypass graft at the time of surgery. Dr Bassin's team are planning to gather this data and to follow these patients over the

longer term to establish whether there were any signs at the time of surgery which would indicate future graft failure.

Dr Bassin and his team have developed an excellent foundation to conduct a robust and successful trial, including the production of two computer programs to extract and analyse the desired information. Even at this early stage, this degree of in-depth assessment of ultrasound output has never been done before. The trial hopes to change the way coronary bypass surgery is done in the future by reducing graft failure and therefore the need for subsequent therapy. This trial will also have the added benefit of involving and attracting new, young academics to cardiothoracic surgery, improving their knowledge and helping them to be better surgeons.

Dr Bassin and his team would like to thank donors who have supported this study. Without you, this study could not be conducted. There have been some delays in patient recruitment due to COVID-19 impacting the availability of surgery for some patients, this situation has improved, and recruitment continues. They are looking forward to having the first scan results back in twelve months.

Developing 3D bioprinted cardiac patches using human stem cells



Project Title:

Developing 3D bioprinted cardiac patches using human stem cells for heart regeneration.

Lead Researcher:

Dr Carmine Gentile

Dr Gentile and his team have been researching and developing heart patches from stem cells-derived heart cells. Over the past year Dr Gentile's team was successful in producing 3D bioprinted heart patches to create contracting tissues that can repair damaged, infarcted hearts. Results have shown that the 3D bioprinted patches were able to improve heart infarction contraction, showing no harmful side effects during the study. His study particularly showed that the formulation of the 3D bioprinted patch was able to not just improve how an infarcted heart contracts, but it was also the best treatment among others using similar approaches. These results will have a huge impact on future studies aiming at regenerating parts of the heart that have died following a severe heart attack

and will hopefully help heart failure patients.

Dr Gentile's results from this study have been compiled in a research article that was submitted for publication in a high impact Journal titled "Acta Biomaterialia", which is highly recognized within the bioengineering community

Potential impact from these results are huge advancements in the field of cardiac bioengineering that may help with the development of novel ways to treat the thousands of Australians each year that suffer the irreversible damage of a heart attack. These new advancements may help to be used to treat patients in need of a heart transplant through a minimally invasive approach as opposed to a heart transplant requiring a very invasive procedure, that not enough people are able to receive each year.

*Indigenous Australians had **cardiovascular disease hospitalisation and death rates** that were over **50% higher** than non-indigenous Australians⁵*

5. Cardiovascular disease – heart, stroke, and vascular diseases Last updated 1/12/2020 v16.0 © Australian Institute of Health and Welfare 2021.

Research Projects

Unravelling the calcification – inflammation axis to predict the risk of heart disease



Project Title:

Unravelling the calcification – inflammation axis to predict the risk of heart disease

Lead Researcher:

Dr Belinda Di Bartolo

In Australia, one person suffers a Heart Attack every 10 minutes. It's the biggest cause of premature cardiovascular death and a major driver in disability of those that survive. The biggest contributor to heart disease is atherosclerosis. This disease starts with cholesterol build up in the blood vessels and is maintained by inflammation. Over time, a patient's genetic background, presence of obesity, diabetes and high cholesterol contributes to the disease's progression and in some cases to a heart attack or stroke.

Dr Di Bartolo's study aims to investigate the signaling

mechanisms that drive diseases associated with vascular calcification by utilising in vitro and preclinical markers. She sets out to investigate calcification markers whilst therapeutic approaches will be made on promising targets. Combining advanced image analysis with cutting edge single cell technologies to categorise patterns of calcification to explore its correlation with inflammation to improve risk predication.

Significant progress on the discovery and translation of blood based multi-omics biomarkers for coronary artery disease (CAD) has been made by Dr Di Bartolo. Identifying metabolomic, lipodomic, proteomic and genuine signatures of plasma from the first 1000 patients from the BioHEART-CT cohort. Isolating the extracellular vesicles from the plasma to identify biochemical signatures distinct to CAD. Dr Di Bartolo has also been successful in culturing endothelial colony forming cells from peripheral blood of patients and has analysed transcriptomic changes in the cells.

Dr Di Bartolo has found that specific T-regulatory subsets were related to having increased odds of suffering CAD. These findings found that adaptive T-regulatory cell response seen in patients

with atherosclerosis CAD and may prove useful in future efforts to guide development of novel therapeutic targets. Additionally, a relationship between the presence of the metabolite DMGV and the presence of CAD using plasma from patients. Using the plasma gathered from patients, lipid profiles were able to be generated. Finding that these lipid features can perform better than the traditional Framingham Risk Score in healthy people group. Which suggests lipodomic signatures can be used to greatly improve the performance in the low to intermediate risk subpopulations, showing potential for clinical treatment of early detection of CAD.

The study's multi-omics approach to analyse samples using various techniques has provided multiple large datasets that can identify novel biomarkers and potential therapeutic targets against CAD. This approach can now be used to make casual inference on specific metabolic pathways where the optimal biomarker can later be determined.

With the ongoing support and funding, Dr Di Bartolo and her team are one step closer to unravelling new mechanisms and finding new biomarkers for coronary heart disease. Now being able to identify previously

unrecognised molecules existing in the blood that can be powerful biomarkers to inform us of silent coronary artery disease.

Dr Di Bartolo is beyond grateful to the donors who have supported to the research program at Heart Health Australia, making it possible to

conduct this life saving research and that could help reduce the number of heart attacks in Australia.

Use of blood extracellular vesicles (EVs) as biomarkers for “hidden” coronary artery disease in patients.



Project Title:

Use of blood extracellular vesicles (EVs) as biomarkers for “hidden” coronary artery disease in patients

Lead Researchers:

Dr Hooi Hooi Ng and
Dr Sina Fathieh

The emergence of the role of EVs in cardiovascular disease has grown exponentially over the past few years. Dr Ng and Dr Fathieh’s high-throughput approach to analyse samples collected from the BioHEART study provides multiple large datasets that can be used to identify novel biomarkers and therapeutic targets to tackle CAD. This project sets out to provide a proof-of-concept diagnostic tool, based on the EV biochemical, lipidomic, and metabolomic signatures to improve better clinical decisions.

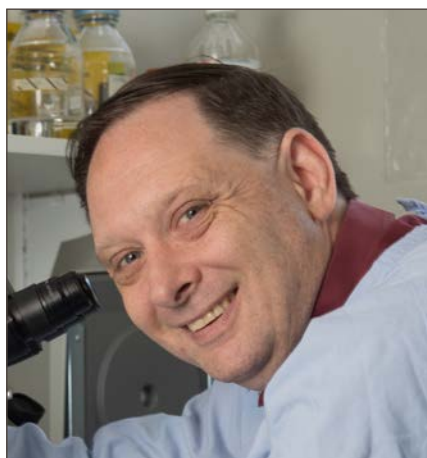
Dr Ng and Dr Fathieh have completed the EV isolation process for all 633 patient plasma samples, performing several optimisation experiments. EVs are mediators of intracellular signaling that carry important lipids, proteins, metabolites, and nucleic acids. The initial plan was to re-suspend the isolated EVs in phosphate buffered saline. However, it was observed that phosphate ions in solutions

can result in slightly shifting in the vibrations. This may interfere or mask true signals derived from patient samples. As a result, they are proceeding the testing in ultra-pure water to ensure the signals are clean and noise-free. 50% of the experimental portion of the Fourier transform Infrared (FTIR), has been completed. A pilot experiment was performed to detect lipid species from human plasma EV samples using LC-MS and have successfully detected hundreds of lipid species. Expecting to observe similar outcomes from the BioHEART-CT plasma EV samples.

Dr Ng and Dr Fathieh are thankful for the donors who have supported the research program at Heart Research Australia, the success of their research program would not have been possible without these resources.

Research Projects

Pre-eclampsia and Post-Partum Cardiomyopathy



Project Title:

Understanding the role, and therapeutic opportunities from targeting the TPb isoform in pre-eclampsia and post-partum cardiomyopathy.

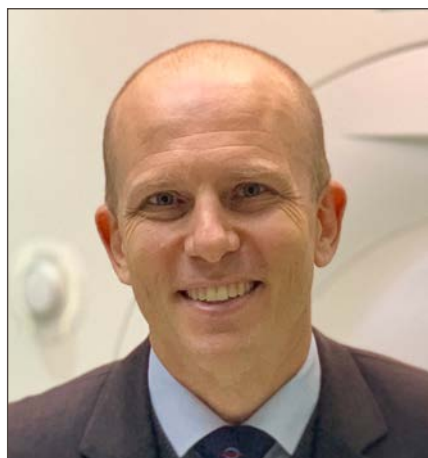
Lead Researcher:

Dr Anthony Ashton

Unfortunately for some women, some pregnancies end in unforeseen and currently untreatable complications. The signs that something is wrong in these pregnancies are unfortunately “normal” for most women at the end of pregnancy. Pre-eclampsia is a leading cause of maternal death and disability effecting 5-10% of all pregnancies in Australia and is associated with high blood pressure and impaired kidney function in the second half of a pregnancy and carries a lifelong increased risk of heart disease if the mother survives. Pre-eclampsia is caused by aspects of the placenta that distress the mothers blood vessels triggered by the human-specific gene (TPb). This gene is absent from normal pregnancies and increased in pre-eclampsia, stopping new blood vessels from forming, limiting placental growth and function. It’s been found to restrict the development of mice in utero, being characterised by elevated blood pressure and circulating levels of sFlt-1, the driver of pre-eclampsia in patients.

TPb when expressed in mice also caused a life-threatening pregnancy complication called peri-partum cardiomyopathy (PPCM). Over 50% of women with PPCM fail to recover heart function and require a permanent left ventricular assist device. Findings identify a causative factor in pregnancy induced heart failure, confirming the common origins of pre-eclampsia and PPCM. This project will determine why TPb is dysregulated in pre-eclampsia and PPCM, and identify first of their kind drugs to manipulate TPb gene expression and validate their effectiveness in modulating pre-eclampsia. Dr Ashton and his team extend their gratitude to the passion and support of donors who help uncover the fundamental research to benefit all women with less-than-optimal pregnancy outcomes. This research aims to ensure a complication free pregnancy for every mother and the healthy delivery of all babies in our care.

Developing Non-Invasive measurement of left atrial pressure

**Project Title:**

Developing Non-Invasive measurement of left atrial pressure.

Lead Researcher:

Prof Martin Ugander

Heart failure affects about 40million people worldwide, which is roughly 2% of adults and 6-10% of people over 65 years of age. Once diagnosed, heart failure leads to 50% mortality within 5 years. This survival rate is worse than most cancers and leads to a large patient group with a sizable burden of hospitalization and premature death.

A particularly large group of heart failure patients that are difficult to both characterize, diagnose, and treat, includes heart failure due to high blood pressure, diabetes, and/or obesity. This category of heart failure is particularly associated with three problems, inefficient filling of the heart, thick walls of the heart, and a reduction in blood flow to the smallest vessels of the heart. These three problems are more common with increasing age, are more common in women and indigenous populations, and have been shown to be associated with hospital admission and death.

Professor Martin Ugander's research uses internationally unique, boldly novel, and state-of-the-art methods to address currently unmet clinical needs with regards to methods for the diagnosis and treatment of heart

failure. This is highly clinically relevant with a large potential clinical impact.

The results of this research will potentially benefit all patients being evaluated for known or suspected heart failures. More accurate diagnostic methods lead to earlier detection, earlier treatment, decreased morbidity and mortality, and ultimately decreased costs for the healthcare system.

Professor Ugander and his team have pioneered new methods for diagnosing the causes of heart failure through imaging methods, such as MRI and CT and electrical activity of the heart (ECG). The detection of heart disease by advanced ECG is particularly valuable since these new methods are software based, do not require new ECG hardware, and can readily be made accessible in rural areas.

Since the start of this project, Professor Ugander has founded a multi-disciplinary research team currently consisting of twenty-one members. This past year, twenty-seven articles and one Master thesis have been published by team members. Your generous donations have been instrumental to establish and expand the research group and help fund essential research.

Research Projects

Prevention of arterial hypertension and cardiovascular disease in premature infants later in life by examining early kidney development.



Project Title:

Prevention of arterial hypertension and cardiovascular disease in premature infants later in life by examining early kidney development.

Lead Researchers:

Prof Martin Kluckow
Dr Eveline Staub

Heart Research Australia and the Mill House Foundation have been supporting newborn cardiac research projects in the department of Neonatology at Royal North Shore Hospital for over 23 years. The generous donations

by the Mill House Foundation via Heart Research Australia have funded the position of a part time research nurse for the past 17 years in the Department of Neonatology. The current research nurse is invaluable in the gathering of data and general smooth running of several cardiovascular studies. For this support, the research team is deeply grateful.

Each year 26,000 babies are born prematurely in Australia, approximately 450 to 500 of which are treated in the Neonatal Intensive Care Unit at Royal North Shore Hospital every year. Results from studies conducted by our research team have helped shape several new diagnostic and therapeutic approaches on how cardiovascular problems are treated for some of their tiniest patients locally, and around the world. Due to these improved practices, even the tiniest of their premature patients increasingly survive their NICU stay and grow up free of major disabilities.

Over these next few years, the RNSH NICU research team are expanding their cardiovascular studies to research other important longer term cardiovascular outcomes long term, particularly in preterm infants. With improved

survival for preterm babies, researchers have noticed that even babies born just a few weeks before their due date have a higher risk of suffering and dying from cardiovascular disease as adults. Professor Kluckow and Dr Staub are investigating problems associated with blood vessels in babies currently being born pre-term, to try to understand what is causing these teens and young adults born prematurely to suffer increased cardiac risk factors at a much younger age than those born at term.

A new study in the Department of Neonatology at Royal North Shore Hospital focuses on tracking the development of kidneys in premature babies. Over the next three years, approximately 80 pre-term and term babies will be followed from their birth at different weeks of gestation until they reach 1 year of age by new techniques of ultrasound imaging of blood vessels in the kidneys and aorta, blood pressure measurements and measurement of kidney function. Preliminary results show there is a correlation between size and abundance of small blood vessels in kidneys of preterm and full-term infants. Ultrasound of the kidneys of a preterm infant born at 25 weeks and term infant have

demonstrated an obvious reduction in blood flow in small arteries in the superficial layer of the kidney. They aim is to follow this cohort of infants into adolescence to confirm the association between poor development of small blood vessels and high blood

pressure with associated cardiac diseases. With the insights from this innovative study, Dr Staub & Professor Kluckow hope to shed light onto the late cardiovascular consequences of premature birth. Ultimately, increased knowledge of the mechanisms leading to

hypertension will help identify those at highest risk, allowing education of the family physician in the importance of early screening and intervention to prevent later heart disease.

Purchase of a new echocardiogram machine



Project Title:

Purchase of a new echocardiogram machine and its associated transesophageal echocardiogram probe.

Lead Researcher:

Dr Chris Choong

Dr Chris Choong, Director of the Echocardiography at Royal North Shore Hospital laboratory has received funding for a new echocardiogram machine and its associated transoesophageal echocardiogram probe. These investments will impact the future of patient outcomes and safety, helping provide detailed images required for performing non-surgical valve procedures.

The increasing complexity of the procedures in Structural Heart Disease (where doctors can repair heart structures using instruments inserted via the arteries or veins of the legs without opening the chest) calls for superior precision in imaging and greater sophistication in image processing and presentation. With the new Philips EPIQ CVxi package now in full use, Dr Choong is able to soon

add a novel imaging system called EchoNavigator, whereby the ultrasound images from the echo machine are superimposed live directly onto the Xray images in the cardiac catheterisation laboratory. This ability allows co-registration on the one screen what the echo-cardiologist is seeing on ultrasound with exactly what the interventional cardiologist is seeing on Xray in the same point inside the heart. Such an ability to simultaneously see live superimposed ultrasound and Xray images is a major engineering feat that will open up new areas of investigation and treatment for patients.

Dr Choong is incredibly grateful to be receiving the substantial funding for this equipment. Stating

“It will undoubtedly improve our ability to provide the best care and outcome for our patients.”

Research Projects

Dr Elisha Hamilton - Senior Scientist/Lab Manager for Professor Helge Rasmussen

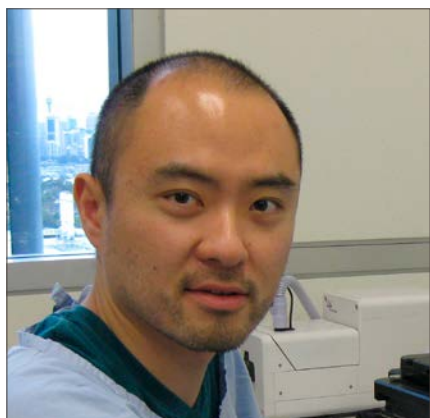


Dr Hamilton is responsible for experimental work conducted within Professor Rasmussen's laboratory as well as providing a supervisory role to students within the lab. A current focus in this experimental work is resuming laboratory work for the "Preventing

cardiac side effects from breast cancer treatment" study. Dr Hamilton is currently implementing the final treatment regime for this study and to soon begin data analysis. Consenting of patients and collecting placentas has also commenced for the "Re-purposing of Beta3 Adrenergic Receptor Agonists as a Novel Treatment of Pre-eclampsia" study. Data analysis conducted by Dr Hamilton in association with collaborators in Denmark has been completed, resulting in a very interesting manuscript detailing how a novel treatment may be useful in patients with severe or terminal heart failure.

Dr Hamilton's role as Laboratory Manager requires a balance of the scientific needs of the laboratory staff and students with the business needs of the lab. In addition to experimental work, her duties include the maintenance of laboratory equipment, procurement, data management, budgeting, training staff/students and liaising with collaborators. Dr Hamilton also acts as the work health and safety representative for the laboratory group, as well as the preparation and submission of funding applications, scientific manuscripts, and ethics applications.

Owen Tang - Laboratory Manager for Professor Gemma Figtree



Dr Tang, in his role as Postdoctoral Research Associate and Lab Manager has significantly contributed to the progression of the diverse projects with Professor Figtree's research team. As well as offering mentorship and technical

expertise to the entire research team, including co-supervision of 4 Honours students, Dr Tang has taken a leading role in the advancement of our metabolomics projects. Together with The BioHEART team, Dr Tang has contributed to the significant progress in the screening of the first 1000 patient samples using emerging technologies to identify new blood biomarkers spanning across the entire biology of a patient. Dr Tang's research contribution has been critical for the achievement of a range of diverse project milestones. His work will

directly contribute to the broad research goal of identifying new mechanisms and biomarkers of coronary artery disease and risk of heart attack through the integration of state of the art "omics", bioinformatics, and imaging techniques in well-established and well-phenotypes cohorts. A greater understanding of outcomes and mechanisms in CAD patients with minimal or no risk factors will be a world first and generate novel insights and improved strategies to promote optimal cardiovascular health and access to care for all Australians.



If you or someone around you was suffering from a heart attack, would you know what it was? Would you know what to do? Visit heartresearch.com.au/heart-attack to learn the symptoms of a heart attack as well as a heart attack action plan.

1 in 3
Australians aged
18 and over have
high blood pressure -
one of the risk factors for
heart disease¹

HEART DISEASE

Kills one
Australian
every

30 MINUTES²



1. AIHW - Australian Institute of Health and Welfare (2022) Australia's health 2022: data insights, AIHW, Australian Government.

2. Australian Institute of Health and Welfare 2021. Deaths in Australia. Cat. no. PHE 229. Canberra: AIHW.

Scholarships funded by Heart Research Australia

Dr Avedis Ekmejian - How best to determine what coronary plaque characteristics cause more limitation to blood flow in the heart.



When a cardiologist suspects a patient has a blockage or lesion in their

coronary artery, that may lead to or be causing chest pain or a heart attack, a coronary angiogram is usually performed. While this procedure is common to determine whether a stent needs to be implanted to maintain blood flow to the heart, there are more evidence-based tests that can be performed during the angiogram to guide this decision making. This

includes pressure wire tests such as FFR and iFR.

The iEquate trial aims to combine multimodality coronary physiology with optical coherence tomography (OCT) to improve understanding of how plaque geometry and consistency can impact blood flow in the coronary artery. Patients referred for invasive angiography at a tertiary referral hospital who met the inclusion and exclusion criteria were consented for the study prospectively. Patients with 50-75% angiographic stenosis (narrowing of coronary artery) underwent coronary physiology

using a combination of CFR, iFR, FFR and OCT, performed on all suitable lesions. Currently, there have been 99 lesions analysed, with the arc of calcium being the most notable predictor of limited blood flow (iFR and FFR). Analysis and recruitment is ongoing.

Dr Ekmejian's research also looks at mechanisms that could cause varying results between FFR and iFR (discordance). Findings will allow a more refined interpretation of pressure wire findings, helping guide more accurate clinical decision making.

Angus Fung - Using cardiovascular mortality to better understand stroke volume and cardiac output.



Angus Fung has been working on methods for his project "Using cardio-

vascular mortality to better understand stroke volume and cardiac output". Angus has been experimenting with different statistical analyses and consulting various statisticians and professors to determine the best method for this project.

The project aim is to determine the

best way to account for body size when considering stroke volume (and associated measures), as well as determining a cut-off point where there is an increased risk in mortality. As a parameter of exploration, he has also been working on a similar project with left atrial volume.

Angus has submitted a paper titled "Prognostic association supports indexing size measures in echocardiography by body surface area" to the Journal of the American Society of Echocardiography and is eagerly

awaiting review.

Stroke volume, cardiac output, and left atrial volume are standard variables measured in echocardiography. Angus Fung's paper on body surface area confirms current guidelines using big data and disputes new studies suggesting a change to indexation by height variables. This better understanding of an empirically derived cut-off value will help provide clinicians with a better idea of how to manage patients.

Dr Chris Roche - Developing 3D biprinted personalised 'replacement parts' for heart attack patients.



Dr Chris Roche, a cardiac surgical trainee funded by HROz since

2019, has brought surgical skills and insights to the team supervised by Dr Carmine Gentile – a bioprinting expert working towards producing heart patches made of special 'bio-ink'. Together, their project aims to regenerate parts of the heart that have died following a severe heart attack and help heart failure patients. The 'bio-ink' uses individualised stem cells taken from

blood or skin samples, which are then converted to beating heart cells.

Dr Roche completed a patch testing project in a live animal model to determine if the patches protected against heart muscle damage after a heart attack. This was found to be successful with the patches that were transplanted, protecting mice against loss of heart function due to myocardial infarction. Dr Roche also discovered that both the host immune response and gene expression changes were altered, proposing a new "dual mechanism". Following this, patches were transplanted into a pig cadaver, with

a world first proof of concept work testing robotic surgical instrument.

This research paper is currently under review with a leading bioengineering journal. An additional surgical instrument intervention research paper was also published, and Dr Roche's PhD thesis document has been finalised and is currently being examined. This project was only possible due to funding from Heart Research Australia and its success brings significant advancements to a future where patients suffering from heart failure or heart muscle damage will have an alternative treatment to an invasive heart transplant.

Dr Di Wu (Woody) - Halting free radicals which alter the sodium pump and can lead to heart failure



Dr Wu has begun working on investigating a novel pathway that involves

free radicals which cause damage to the heart, and results in the enlargement and scarring of the heart. Dr Wu aims to discover whether this pathway can be targeted with new medicines in order to develop new and better treatments for heart failure. Free radicals occur as a byproduct of oxygen in our blood, an over abundance of these free radicals can be deadly to the body causing disease, and is a common feature

driving heart failure. Many studies have found that antioxidants are promising treatments to disease caused by free radical abundance. However, they have been unsuccessful in improving cardiovascular outcomes in clinical trials.

The heart cells contain a pump on the cell wall that controls the movement of certain ions which keeps the heart pumping as it should. Changes to the function of this pump (the Na⁺-K⁺ ATPase – or Na⁺-K⁺ pump) can lead to heart failure. Dr Wu has strong evidence to hypothesise that a specific modification caused by free radicals change the structure of the pump, thereby changing pump function

causing the heart to pathological remodeling and scarring on the left ventricle. Dr Wu will investigate this signaling pathway in a controlled pre-clinical setting using an unbiased, population-based approach to a human cohort. This will allow for a clearer definition of the role signaling pathways plays on pressure-overload remodeling, offering insights for therapeutic innovation.

Dr Wu's project explores the hypothesis that modifying the redox reaction of the Na⁺-K⁺ pump may regulate redox-induced cardiac fibrosis and hypertrophy by using two investigations involving genetically modified mice.

Keeping Hearts Beating

The Heart Health Club

Receiving the overwhelming news you have a heart condition, have suffered a heart attack, or require surgery can be a very lonely and isolating time for the patient, family and carers. On returning home from hospital or a doctor's surgery or even knowing you have a family history with heart disease can leave you with many questions.

Heart Research Australia has recently relaunched our Heart Health Club to help provide support and advice to those directly or indirectly affected by heart disease.

Joining our free Heart Health Club enables members to receive access to exclusive offers and information, including:

- ♥ *Mental Wellbeing guidance and strategies to implement in your heart health journey*
- ♥ *Exclusive free webinars with our cardiologists and other health experts*
- ♥ *Exercise tips and programmes from Accredited Exercise Physiologists*

♥ *Heart Healthy Recipes*

♥ *E-Newletters with exclusive content from heart health experts, tips and advice from Cardiologists, as well as the latest updates from our Researchers*

♥ *Access to our private Facebook community to connect with others going through a similar experience.*

You can join our FREE Heart Health Club here

www.heartresearch.com.au/heart-health-club/

Connecting with others in a similar situation can be helpful to manage any strong emotions you may be feeling or questions you may have. Heart Health Club members can access our private Facebook community here where heart patients and their carers can share support and advice.

www.facebook.com/groups/hearthealthclub



Heart Health Videos

This year we introduced two new educational videos on men and women's heart health, covering two of the most dangerous mistakes people make about heart attacks. These mistakes included:

- ♥ Assuming the symptoms are the same for everyone
- ♥ Not acting quick enough by dismissing symptoms thinking they will go away

A heart attack can present differently for every person, particularly between men and women. Raising awareness of the early warning signs of a heart attack and how they can present differently is vital to educate the community on what to look for and what to do should these symptoms arise.

Our new videos on men and women's heart health share information from cardiologists Dr Ashleigh Dind and Professor Ravi Bhindi on the early warning signs of a heart attack, and what steps to take to keep your heart healthy.

While men suffering from a heart attack typically describe chest pain or discomfort, women are more likely to have non-chest pain related symptoms such as fatigue, shortness of breath or indigestion.

The two videos cover these differences in heart health and heart attacks for men and women, particularly aiming to educate women on the role menopause plays on women's heart health and the importance of sharing obstetric history with their current GP. Something many may not consider or be aware of.

These videos join our Matters of the Heart Cardiac video series. The topics of these videos include:

- ♥ About Angiography;
- ♥ What is a Heart Attack?
- ♥ The Importance of Cardiac Rehabilitation.

Heart Research Australia share regular and ongoing education with our Heart Health Club Members to raise much needed awareness within the community and to help alleviate any anxiety patients and families may feel when receiving a heart disease diagnosis.

Becoming a member of our Heart Health Club can continue this education through a variety of information we share from heart health experts throughout the year.



Keeping Hearts Beating

Heart Attack Wallet Card

This year over 1,300 heart attack wallet cards were distributed to our community.

The Heart Attack Wallet Card calls out the different early warning signs women can experience vs men when it comes to a heart attack, as well as a heart attack action plan should the situation arise.

Something we hear cardiologists say frequently is “time is muscle”, meaning the longer it takes for someone to seek medical treatment for a heart attack, the higher the risk of the heart muscle dying, and irreparable damage being done. Therefore, it's important to take the steps to learn the early warning signs of a heart attack and how to seek treatment sooner.

Unfortunately, many people aren't aware these symptoms can drastically differ between men and women, with many simply brushing signs off, not knowing that what they're experiencing are the symptoms of a heart attack. The wallet card aims to help people become aware of heart attack symptoms and encourage them to seek help as soon as possible to prevent long-term permanent damage.



No family should experience the tragedy of losing a loved one unexpectedly, and we hope the Heart Attack Wallet Card could play a small role in preventing such grief. To order your free wallet card visit:

heartresearch.com.au/heart-attack-wallet-card/

LIKE us!

Want to see all the latest updates from our researchers, events and heart health tips? Make sure you like and follow our Facebook page to keep your heart health top of mind. We are also on Instagram, LinkedIn and Twitter.

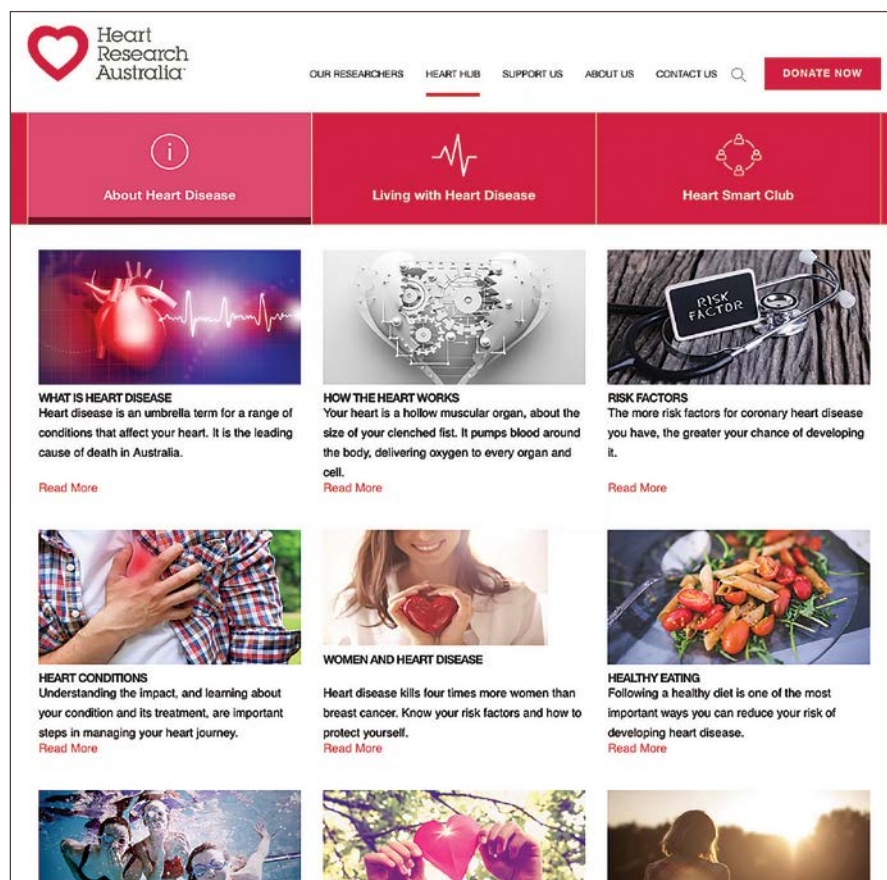


The Heart Hub

The Heart Hub, featured on our website, provides easy to understand information about heart disease, risk factors and the different types of treatments, conditions and procedures available for those affected by heart disease.

There are also personal stories to read about patient experiences with heart disease. Make sure you are signed up to our Heart Health Club for all the latest information in heart health.

Visit the Heart Hub at heartresearch.com.au/heart-hub for more info.



Financials

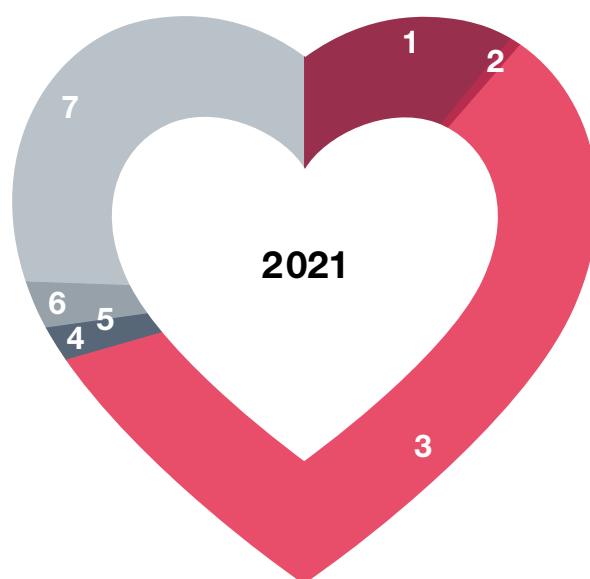
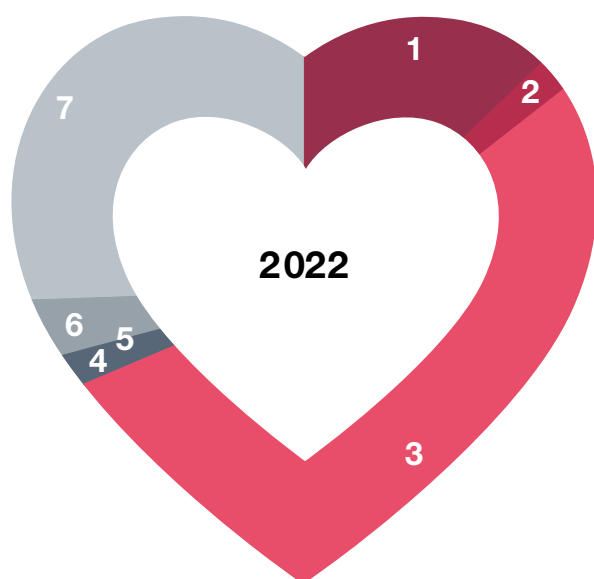
Heart Research Australia's vision is "making breakthroughs in heart disease happen", and donations received from our donors makes it possible for the cardiac researchers we support to conduct ground-breaking work into the prevention, diagnosis, and treatment of heart disease.

We thank our supporters for their kind donations and are proud of the contribution of \$35.3m we have made since the inception of Heart Research Australia towards fighting the devastating effects of heart disease and keeping families together for longer.

In an increasingly competitive environment to source funds, Heart Research Australia is continually reviewing its strategy and market position to ensure it invests wisely in donor acquisition and its brand. These actions will help maintain and build a supporter base for the long-term viability of the organisation and future research.

None of our achievements would be possible without the continuing generosity of our supporters, those who have recognised us in wills together with, the incredible contribution from our community fundraisers, corporate supporters and Trust and Foundations, we thank you.

How you have helped us over the part two years - Income



2022		2021
12.94%	1 Appeals	10.99%
1.52%	2 Raffles	0.66%
54.25%	3 Bequests	59.00%
2.29%	4 Corporate	2.14%
0.00%	5 Corporate in kind	0.00%
3.68%	6 Community	3.01%
25.32%	7 Other donations (Includes Merchandise)	24.19%

Income	2022	2021
Fundraising activities	2,344,943	2,446,701
<i>Appeals</i>	303,467	268,885
<i>Raffles</i>	35,628	16,183
<i>Bequests</i>	1,272,180	1,443,631
<i>Corporate</i>	53,592	52,432
<i>Corporate In Kind</i>	--	--
<i>Community</i>	86,278	73,616
<i>Other Donations</i>	593,798	591,954
Non-operative activities	85,269	352,300
Total income	2,430,212	2,799,001

Expenses	2022	2021
Employee costs	733,654	716,547
Fundraising	336,076	401,472
Administration	172,236	128,344
Provision for Doubtful Debt	--	--
Corporate In Kind	--	--
Research support	960,723	770,036
Total expenses	2,202,689	2,016,399
Net surplus/(deficit)	227,523	782,602

Assets and Liabilities	2022	2021
Cash and cash equivalents	3,082,630	3,394,677
Trade and other receivables	76,457	70,663
Financial investments	1,038,214	729,619
Plant and equipment	14,145	14,466
Intangibles	15,889	10,003
Inventory for distribution	24,605	27,953
Total assets	4,251,940	4,247,381
Trade and other payables	558,754	815,799
Provisions	94,683	60,602
Total liabilities	653,437	876,401
Net Assets	3,598,503	3,370,980

Our Governance

Heart Research Australia is a company limited by guarantee. We are registered with the Australian Charities and Not-for-profits Commission (ACNC) and are authorised to fundraise in most Australian States and Territories. Heart Research Australia is approved by the Australian Tax Office as a health promotion charity and a deductible gift recipient.

Heart Research Australia is an organisational member of the Fundraising Institute Australia (FIA) and abides by the FIA's Principles and Standards of Fundraising Practice.

BOARD OF DIRECTORS

Heart Research Australia is governed by a Board of Directors. Members include cardiologists, academics, researchers, and business leaders. The Board's responsibilities include oversight of the Foundation's financial management, corporate governance, and compliance with statutory requirements to ensure its long-term viability. The Board monitors the risk profile of the organisation and addresses the key risk areas of Revenue, Expenses, Research and Administration.

Office Bearers

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Anthony Crawford

BA, LLB, FAICD

Retired Solicitor

Company Director

VICE CHAIR:

Professor Ravinay Bhindi

MBBS (USyd), MSc (Oxon), PhD (USyd), FRACP, FCSANZ, FESC

Professor, University of Sydney
Head, Department of Cardiology,
Royal North Shore Hospital
Consultant and Interventional
Cardiologist

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Dominic May

JP, MAICD

Corporate Services Manager &
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MIP (Law) (UTS)

NHMRC Senior Principal
Research Fellow

Professor in Medicine, UNSW
Head, Vascular Biology and
Translational Research, School
of Medical Sciences, UNSW
Medicine

Dr Rebecca Kozor

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FCSANZ

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Hospital & North Shore Private
Hospital

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Sydney

Co-director, University of Sydney
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Previously CEO National Heart
Foundation of Australia (NSW)

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Dr Ashleigh Dind

MBBS (Hons I), FRACP

COMMITTEES OF THE BOARD

The Research Grant Advisory Committee (RGAC) reviews applications made to the Foundation for financial support, monitors the research activities funded by the Foundation and makes recommendations and delivers reports to the Board of Directors on matters relating to the research objectives of the Foundation. Members of the RAC are all highly qualified researchers and practitioners.

CHAIR

Dr Michael Ward
MBBS (Hons), FRACP, PhD,
DDU, FCSANZ
Consultant & Interventional
Cardiologist

MEMBERS

Prof Ravi Bhindi,
Prof Levon Khachigian
Dr Rebecca Kozor

When reviewing applications for Project Grants and PhD Scholarships, membership of the RAC may be supplemented by academics, researchers, and clinicians from the broader research community to provide external expertise and advice.

EXTERNAL MEMBER

Dr Victor Hsieh
(St George and Sutherland
Clinical School & UNSW)

Prof Grant Drummond
(La Trobe University, Vic)

Prof Wendy Jessup
(ANZAC Research Institute, NSW)

Dr Mary Kavurma
(Heart Research Institute, NSW)

Prof Yong-Jian Geng
(Texas Health Science Center at
Houston, TX, USA)

Governance review

The Board Charter, adopted in September 2016, commits the Board to “**excellence in governance**”. To this end, a program of periodic review has been established to ensure all aspects of the Foundation’s activities are consistent with best practice for the sector.

The primary role of the **Scientific Advisory Committee (SAC)** is to advise the Board on future directions in research and the resources required to support future research initiatives.

CHAIR

Prof Levon Khachigian

MEMBERS

Prof Ravi Bhindi
Prof Gemma Figtree
Brigid Shute
Tony Thirlwell
Dr Michael Ward

Honours Board

Heart Research Australia supports world-class and emerging researchers to conduct groundbreaking research into the prevention, diagnosis and treatment of heart disease.

By supporting 'seed' funding, we allow our researchers to turn their innovative, 'out of the notebook' ideas into reality. This type of first stage research does not qualify for government funding, so we rely on the community to help make the investigation of such ideas possible.

We would like to recognise the incredible generosity of the following individuals and organisations who have contributed significantly to help these major breakthroughs happen and save lives. We are so truly grateful for your wonderful support. Thank you.

Significant benefactors \$25,000+

Jan and Lyn Shaddock
National Club

Significant benefactors \$10,000+

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Edward Hamilton Jacob
Wendy Noela McCormick
Anita Stafford McKenzie
Athol Bishop Meers
George and Mary Thompson
June Florence Weller

Organisations and Ambassadors

AFL South Coast
Australian Rugby Union (ARU)
Anna & Alessandro Pavoni from
Ormeggio
Chris Russell AM
Con Dedes from the Dedes Group
Northern Suburbs Rugby Club
Gary Dawson OAM and The
Charity Challenge
Jen O'Neill
Cathy Licuanan
Brooke Williams
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