

The Beat

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Aspiring Doctor with a Passion for Research



Recently completing a research project at The Queen Elizabeth Hospital medical student Aashray is eager to continue research into heart disease.

Fourth year medical student Aashray Gupta is setting his career sights high.

Dedicating his 2014/15 summer holidays to research, last year Aashray achieved the Basil Hetzel Institute for Translational Health Research (BHI) Summer Scholarship supported by Australian Heart Research, to pursue a heart research project at The Queen Elizabeth Hospital (TQEH).

Under the supervision of Professor of Medicine John Beltrame, Aashray's project examined the complication rates of Percutaneous Coronary Intervention (PCI), a non-surgical procedure that uses a stent to treat Coronary Artery Disease (CAD), a blockage in one or more arteries in the heart.

With CAD being the leading cause of morbidity and mortality in Australia, it's an area in dire need of research and one Aashray was very interested in pursuing.

"There are many levels of CAD severity from stable and unstable angina to a heart attack. These are currently either treated with a PCI or open heart surgery."

Being a non-surgical, less invasive and safer way to remove the blockage, PCIs have become increasingly more common as an alternative treatment to surgery.

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♥ A Mother's Broken Heart

Ina Quinn has been through extreme heartbreak. Losing her 40-year-old daughter Rebecca (Bec) to Ewing's Sarcoma (a rare form of bone cancer) in October 2014, Ina had to endure her own grief while helping Rebecca's three beautiful sons through the loss of their beloved mother.

In October 2015, approaching the first year anniversary of losing Bec, Ina was diagnosed with Takotsubo Cardiomyopathy (TTC), also known as 'broken heart syndrome'.

"Before it happened I felt like I was living it in a heart attack. The grief was so overwhelming," Ina said.

TTC is a weakening of the left ventricle, the heart's main pumping chamber, usually as the result of severe emotional or physical stress, such as a sudden illness, a serious accident, a natural disaster or in Ina's case, losing a loved one.

"It was a week before the anniversary of losing Bec when I sat down one evening to watch TV and suddenly felt very sick and threw up. I tried to ignore it but then I turned white, I couldn't lie down and had to sit up in a very unnatural way and felt like I had a painful stitch," Ina said.

"In the end my partner Martin drove me to the Lyell McEwin Hospital and once I was seen they were quickly able to diagnose me with TTC.



Ina and her beautiful daughter Bec.

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Aspiring Doctor with a Passion for Research

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"PCI involves a balloon attached onto a needle being advanced using x-ray imaging through the vessels of the body until it reaches the heart. Once at the blockage site within an artery of the heart, the balloon then inflates and a stent is placed to open up the artery," Aashray said.

"Medical treatments are constantly evolving and stenting has been refined and improved. Where historically the procedure was only preferred for lower risk patients. This void of information implicates the informed consent process, and so our aim was to update this and as a result, more accurately inform patients of the benefits and risks of the procedure."

To do this, Aashray used the Coronary Angiogram Database of South Australia (CADOSA) which lists all the PCI procedures performed in South Australia's four public cardiac units.

"This is quite a comprehensive database which I was fortunate to have access to. My project analysed all the procedures from these hospitals in 2013.

"What we found is that complication rates are different now to what they were in the past. Although still small, the risk of stroke and heart attack in our population following the procedure has grown.

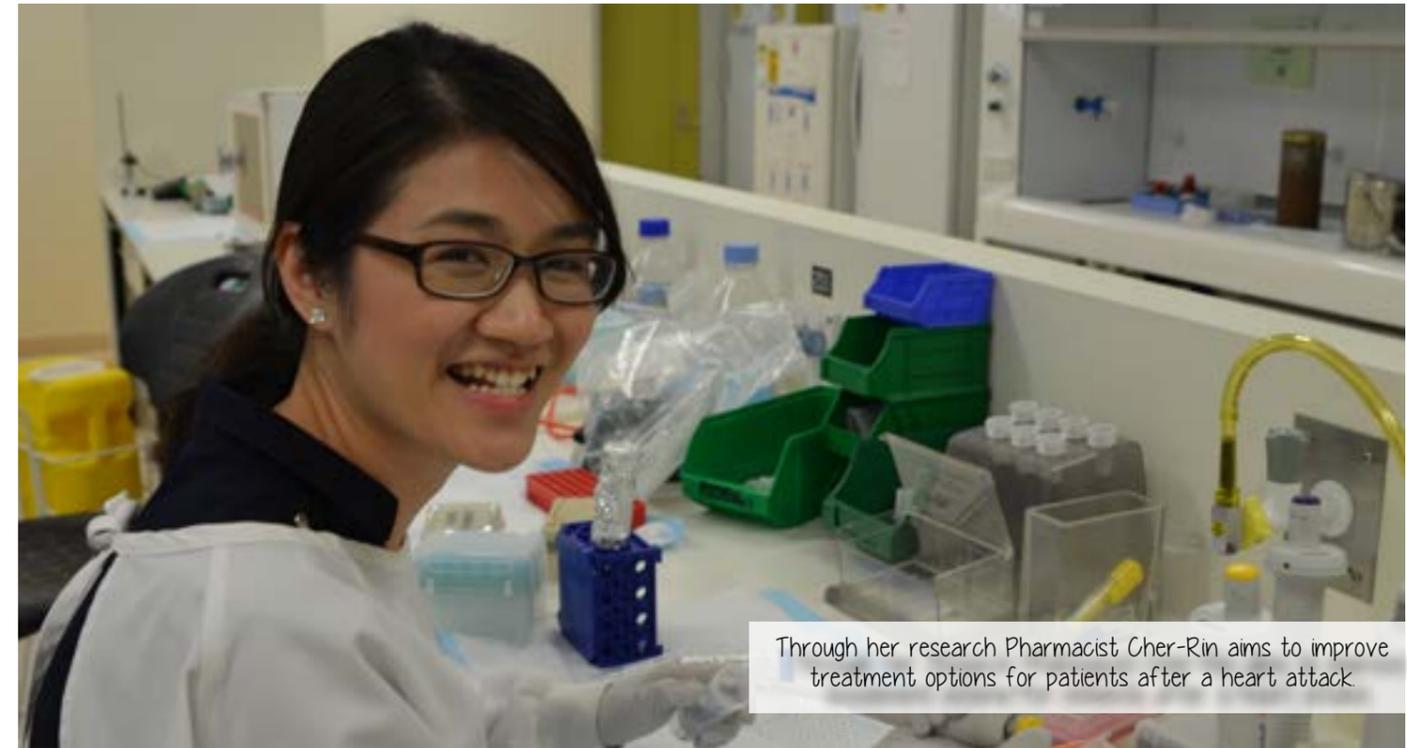
"It's so important to keep this ongoing surveillance of complications and in the future, potentially look at individual cases to understand where improvements can be made."

Aashray presented his work at TQEH Research Day, winning First Prize in the Undergraduate/Honours group. Discovering his love of research, he has since been involved in more research projects through the BHI and TQEH, setting his sights on becoming a surgeon.

"I believe it is highly important for clinicians and future doctors to develop a broad base of research skills. This will allow us to critically evaluate processes and treatments.

"Ideally a balance needs to be struck between improving on the existing body of medical knowledge and delivering effective healthcare. As I progress, I hope to use my own skills to achieve this."

Life-changing Research into Heart Disease



Through her research Pharmacist Cher-Rin aims to improve treatment options for patients after a heart attack.

Cher-Rin Chong wants to make a difference to people living with heart disease.

Looking for a platform to help boost her research skills, Cher-Rin decided to pursue a PhD project at the Basil Hetzel Institute for Translational Health Research (BHI) focusing on improving the energy efficiency of heart disease patients.

Having now completed her PhD, Cher-Rin was examining ways to increase the energy of these patients, specifically studying a drug at the forefront of heart disease treatment, perhexiline.

"Every day our heart extracts nutrients from the blood stream and undergoes a range of chemical reactions to generate energy, which is then used to pump the heart," Cher-Rin said.

"Someone with heart disease does not generate enough energy to keep up with the demands of their heart. My research has been focused on how to reduce energy wastage and maximise energy production of the heart."

Investigated over thirty years ago by Cher-Rin's supervisor Professor John Horowitz and his team, perhexiline has now become a common treatment for patients with heart disease, in particular those with angina, heart failure or a genetic heart disorder.

"Perhexiline is unique because it is the only heart disease treatment in Australia that changes the way the heart uses nutrients, and it does this by selecting nutrients that will maximise energy production," Cher-Rin said.

Whilst a healthy heart will use predominantly fatty acids to generate energy, when someone suffers a heart attack or heart failure their oxygen supply becomes restricted and these fatty acids place more stress on the heart.

"Perhexiline works by replacing fatty acids with sugar. The heart then uses this sugar to generate energy, and it is more efficient for the patient."

Being so unique, perhexiline has changed the lives of thousands of patients living with various heart diseases, but it can have side effects and Cher-Rin wanted to explore these through her PhD.

"The major downside of perhexiline is that it can lead to some severe side effects such as liver and nerve damage, and some smaller ones such as nausea and vomiting."

After analysing large patient cohorts who had been on long-term perhexiline, Cher-Rin discovered that when managed correctly, it is beneficial for those living with heart disease.

"We have found that with modern day regular monitoring some of these severe side effects are actually rare and can be potentially avoided.

"Through my PhD I have also met with diabetic patients to find out the effect of perhexiline on their diabetes control.

"I had some patients who after two weeks on perhexiline showed some significant symptomatic improvement."

Now wrapping up her project, Cher-Rin is excited to bring her new research skills back to her role as a Pharmacist and hopes to pursue further studies in the future.

"If a patient comes in with a problem I want to be able to use my research skills to solve it for them.

"Why can't I be a Pharmacist who runs experiments in the lab as well? That's my ideal job!" ♥

Did you Know?

Coronary Artery Disease is the leading cause of death and disease in Australia.

♥ A Mother's Broken Heart

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"I was in there for five nights and was home for the anniversary – I was on medication for my condition but of course I felt empty.

"I lost my Mother to cancer when she was 59 and I thought that was the hardest thing I would ever have to endure...but nobody should have to go through losing their daughter. It happened the wrong way around – I sometimes still feel like it didn't really happen."

Always thinking of others, after her diagnosis Ina didn't hesitate to agree to be part of a study conducted at The Queen Elizabeth Hospital (TQEH) on TTC which includes regular tests and surveys.

"I was more than happy to volunteer for the research and I feel lucky to be a part of it. It makes me feel very safe and it will help other people in the future."

"Research in this area is so important. We need to find out more about why this happens to certain people and better ways to handle it, including better managing grief.

"I thought I was handling it, but the reality is I was too busy looking after everyone else."

Today, Ina is now making a conscious effort to spend more time focusing on her own health seeing a psychologist regularly and has tried Thai Chi and art therapy.



Researchers at TQEH are focused on improving the lives of people like Ina living with TTC.

She has also felt some comfort in the gift of Australian songwriter, Ash Grunwald's tribute to Bec his number 1 fan with his song written in her honour – Send Me.

While Ina was lucky to be diagnosed so quickly, one of the issues with TTC is that it is often incorrectly diagnosed as a heart attack and patients may receive inappropriate treatment.

The research being conducted at TQEH is looking at improving the diagnosis of TTC and developing treatments. Without people like Ina, this would not be possible.

Australian Heart Research in collaboration with The Hospital Research Foundation is very proud to support this important research into TTC.

We cannot thank Ina enough for sharing her story with us. If you wish to donate to this type of research, please visit:

www.australianheartresearch.com.au ♥

Understanding a Heart Attack Mystery



Passionate about her research, Tharshy wants to pursue further studies and continue to help people affected by heart attacks.

The majority of heart attacks are the result of blocked arteries and are treated with invasive methods such as coronary stents to open the blockages along with medical management to minimise the risk.

However, research indicates 10 per cent of heart attacks occur with fully open arteries or few blockages.

This condition is referred to as Myocardial Infarction with Non Obstructive Coronary Arteries (MINOCA) and has formed the basis of Sivabaskari (Tharshy) Pasupathy's PhD project for the last three years.

"I started my PhD by first understanding the MINOCA patient group since there was not much known about them. We wanted to compare these patients to other heart attack patients who have blocked coronary arteries," she said.

After extensive research on the existing literature Tharshy published a systematic review which was published in the international cardiology journal 'Circulation', an impressive achievement.

"We were pretty excited with the reaction, a lot of people responded to the paper and were talking about it," she said.

"During my PhD, using the Coronary Angiogram Database of South Australia (CADOSA) registry, we identified all the MINOCA patients in South Australia and we identified in most cases the MINOCA patients are more likely to go home with no/little medical management since a cause for their heart attack could not be identified, unlike those who have a visible blockage.

"I am now in the process of writing a paper which highlights the overall characteristics of MINOCA patients in contemporary practice using the registry."

Tharshy also studied 50 patients from The Queen Elizabeth Hospital (TQEH) more closely as they had additional tests to determine the cause of their heart attack.

"The first of its kind in Australia, we aim to generate extensive research output and subsequently a guideline that will provide doctors with a clear way of identifying a MINOCA patient and the best way to manage their condition.

"These guidelines will help cardiologists understand a MINOCA patient, and highlight how important it is to do more testing and not treat their condition as a false alarm."

Eager to pursue further research into this patient group, Tharshy will continue her studies after she completes her PhD.

"I love this area, I had great experiences and there's so much more to explore. I'm looking forward to seeing where new opportunities take me." ♥

Sober November for Heart Disease

Meet Madeline!

Madeline, a postgraduate medical student at The University of Western Australia, was inspired to go sober last November, raising just over \$500 for AHR.

What was Madeline's inspiration?

"From my university studies I have become aware of the high prevalence of heart disease in Australia often related to type 2 diabetes and obesity, of which alcohol can be a large contributor," she said.

"Just because 'October' is over doesn't mean we should forget the risks associated with alcohol consumption.

"I think Australia needs to place more focus on heart disease and that's why I chose to support vital research through AHR."

If you would like to fundraise for AHR please contact us on 8244 0591 or events@ausheartresearch.com.au. ♥

