Genetic Links to Heart Health

Have you ever wondered if your family history could contribute to your chances of developing heart disease? Or whether your living environment is causing your heart to suffer?

Ashburton ambulance officer and Intensive Care Paramedic, Sharon Duthie, has unexpectedly found herself to be actively helping to answer these questions, when she was admitted to Christchurch Hospital Coronary Care Unit. As an inpatient, she volunteered to take part in the Multi-Ethnic New Zealand Study of Acute Coronary Syndromes (MENZACS) being carried out by the Christchurch Heart Institute (CHI), a University of Otago Christchurch Research Centre and the Auckland Heart Group.

The study, led by the CHI's Professor Vicky Cameron and Associate Professor Malcolm Legget of the University of Auckland and Auckland City Hospital, looks into the genetic risk factors that play a part in heart attacks and angina, across a range of ethnic groups such as European New Zealanders, Maori and Pasifika.

Cameron, Head of the Genetics and Molecular Biology laboratory at the CHI said, "We are trying to get a picture of the main risk factors that contribute to heart disease in Māori, and Pacific Islanders, and if these differ from other New Zealanders. This includes what influences their likelihood to recover well or to have further heart issues, by looking at genetics and lifestyle risk factors, including diet and exercise."

Duthie, who has lived all her life on a farm and has an active lifestyle but has smoked most of her life, unexpectedly found herself the patient in her own ambulance when she suddenly became gravely ill and had to be rushed to Ashburton Hospital.

"We had several Red (life threatening) call outs that day. The person we went out to was quickly stabilised, but as we prepared to drive to the hospital I felt very sick and called for a back-up ambulance to help us out," Duthie explained.

Without warning the 52 year-old, collapsed onto the second stretcher inside the ambulance. At the scene her shocked colleague suspected a heart attack and took the ECG leads (heart monitoring) from the call-out patient and put them onto Duthie.

"At the hospital I fully arrested and was brought back using the defibrillator. Thank goodness for my crew partner's knowledge and colleagues who had arrived in the second ambulance, expecting to help the patient we had been called out to see, only to find that I was in a worse state than him!"

Duthie was transferred to Christchurch Hospital by Westpac Helicopter where she underwent a successful procedure, in which a stent was inserted in to her right coronary artery.

As an in-patient, Duthie, who has a Bachelor of Health Science (Paramedic), a Graduate Certificate in Emergency Management and a Post-Graduate Diploma in Paramedic, jumped at the chance to participate in the MENZACS study.

"I am passionate about medical research, to actively find ways to improve healthcare. I hope others will benefit from my situation and become more aware of the big picture affecting heart health, such as the genetic influences as well as lifestyle choices and environments have on our heart health."

The study is funded by the Heart Foundation of New Zealand and the National Science Challenge Healthier Lives Programme.

Medical research has its benefits

Taking part in research studies at the Christchurch Heart Institute, is an opportunity to receive on going and beneficial medical care that could be life-saving, say Research Nurses Stephanie Rose and Carol Groves.

Participants come under two categories, healthy volunteers and those who have suffered some sort of heart-related event.

"If a person is admitted to hospital with a heart event, such as heart attack or heart failure, we can recruit into certain studies while that person is still an inpatient. Following discharge, the individual receives ongoing care not only from hospital heart specialists but research heart specialists, all of whom have extensive medical training and experience."

Carol said other study participants who have never had a heart event are also part of studies. These are called healthy volunteers and their involvement provides test comparisons with those who do have heart issues.

"Research participants, whether they are healthy volunteers or not, all receive the same level of care. They are seen regularly, on average three to four times a year for up to 10 years, depending on the type of study they are in," she said.

There is close liaison between the hospital and research care with consultant cardiologists frequently visiting their patients in the research clinic, as Stephanie explains:"The Consultant Cardiologists who lead the care of inpatients are often also research doctors or professors. It is reassuring for study participants to see their consultant both in the hospital clinic as well as in the research clinic a few weeks or months later."

With this level of attention, research participants can be assured that their overall health is well monitored and any potential problems are picked up.

Jim Farrant began his journey as a participant in heart research when he was admitted to Christchurch Hospital with heart failure in July 2016. As an inpatient he was recruited to the IMPERATIVE-HF study which looks at whether the treatment of heart failure can be enhanced to improve survival and reduce the chance of further hospital admission.

"I was part of the IMPERATIVE-HF study for 3 months and when I finished that, I was offered the chance to take part in the VICTORIA study, which is a drug trial by a pharmaceutical company."

Being part of heart research with the CHI has been of great benefit to Jim.

"I highly recommend taking part in heart research. The people at the CHI are the friendliest group. Everyone knows you personally and takes an interest in your overall wellbeing, not just the heart side of things. If I hadn't taken part in the research I would be a lot worse off. I feel very well cared for and supported. Due to my regular clinic visits and special care, I feel confident that things are picked up and acted on. My medications have been changed because they were originally causing a problem. They check my blood pressure and heart sounds etc. It's very good."

If you have had a heart event and are interested in taking part in research, please call the CHI Research Nurses on 03 364 1759 to find out if you are eligible.

New Zealand-led heart failure findings debunk world medical view

Thousands of New Zealanders can look forward to improvements in treatment and care of heart failure following new research findings that look set to alter the clinical approach and health care planning for heart failure globally.

The findings of a New Zealand-led international research collaboration, recently published in the European Heart Journal, set out how two distinct forms of heart failure previously considered similar in prevalence and risk of death, are in fact very different.

Professor Rob Doughty, NZ Heart Foundation Chair of Heart Health at The University of Auckland's Faculty of Medical and Health Sciences, led New Zealand's participation in the seven-year collaborative study of more than 2000 patients from Singapore and New Zealand. It involved expertise in heart health from four major centres in New Zealand (Christchurch, Auckland, Middlemore and Waikato), and all six main hospitals in Singapore.

"Heart failure is a common and serious condition affecting around 80,000 New Zealanders. In many people with heart failure the heart muscle is stretched and weakened and does not pump properly.

"However, in other cases of heart failure, the heart may have near normal pumping function but the muscle is stiff and often thicker than usual and the heart cannot fill properly between beats. These two types of heart failure were thought to be equal in occurrence and risk of death.

"However, our new findings reveal that the stiff heart muscle is less common than originally thought, affecting about three out of every 10 heart failure patients, and there is less risk of dying from this type compared with heart failure where the heart is not pumping properly," says Professor Doughty.

Two percent of New Zealand's population live with heart failure, and the study's findings provide greater accuracy about their risk of dying.

"Based on our new findings from this study, the global approach and treatment of patients with heart failure, based on measures of heart pump function, may need to be reviewed. This information will influence clinical thought and health-care planning of heart failure around the world, and provide more precise treatment," Doughty said.

Professor Mark Richards, Christchurch Heart Institute Director and Heart Foundation Chair of Cardiovascular Studies, provided overall international leadership and coordination of the work between the two countries.

"Our findings are pivotal to the understanding of occurrence, death rates and risk prediction within different classes of heart failure," Professor Richards says.

Professor Richards won research funding and supervised execution of the study in Singapore, where he is also Director of the Cardiovascular Research Institute of Singapore. A total of 16 distinguished heart doctors and researchers have been involved, including Professor Carolyn Lam of the National Heart Centre in Singapore and Professor Richard Troughton of the Christchurch Heart Institute.

"We are particularly proud to have proven these findings, with identical procedures executed simultaneously in two countries, 5000 miles apart," Richards says.

"In addition, we demonstrated that the world's most successful-ever cardiac biomarker, NT-proBNP, (discovered and validated in the Christchurch Heart Institute) is similarly prognostically powerful in both types of heart failure in both Singapore and New Zealand. Overall, this will exert major influence on clinical thinking and planning."

Funding for the research came from multiple Singapore and NZ sources including the Heart Foundation of NZ, Health Research Council of NZ, Singapore National Medical Research Council and other smaller contributors.

Find us on Facebook

We invite you to donate and/or bequeath to the Christchurch Heart Institute. If this is something you would like to do or find out more about, please contact Lorraine Skelton, Clinical Studies Co-ordinator on **03 364 1063**, email: **lorraine.skelton@cdhb.health.nz.**

Please post a cheque, or direct credit our bank account **02-088-0877177-00** - with your name as a reference. If you would like a receipt for either a cheque or direct credit, return the slip below to us, including your address details.

The Nicholls Clinical Research Centre,
Otago University Christchurch Medical School,
PO Box 4345, Christchurch 8140

First Name:_____ Last Name:_____

☐ Yes, I want to help research into cardiovascular disease.

I am making a gift of ☐ $20 ☐ $40 ☐ $60 ☐ or my choice

☐ A cheque is enclosed payable to the Christchurch Heart Institute Trust

☐ I have paid by direct credit to your bank account

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Newsletter of the Christchurch Heart Institute | June 2018

University of Otago Te Whare Wānanga o Otāgo New Zealand
CHRISTCHURCH

Heart Foundation

hrc Health Research Council of New Zealand Te Kaunihera Rangahau Hauora o Aotearoa

CHRISTCHURCH HEART INSTITUTE Rangahau Manawa o Ōtautahi

Professor Mark Richards, Director, Christchurch Heart Institute.

All our studies aim to make a difference to the future of heart health and treatments. It isn't every day, however, that we can debunk a long-held world view of heart failure

We did just that in February, when the results of a seven-year study were published in the European Heart Journal. These illustrated how two distinct forms of heart failure, previously considered similar in prevalence and risk of death are, in fact, very different. You can read about it in this issue of Heart2Heart.

Working collaboratively between centres in New Zealand and overseas is a key component to the success of several studies involving CHI. We have often initiated the studies and garnered the pooling of resources from other centres of expertise. This mutually supportive approach is also the cornerstone of how the CHI operates internally. Through close liaison and co-operation the team works on 20 or so studies at any time.

What we learn along the way is fed directly back into making a difference to anyone with, or at risk of, cardiovascular disease. In this issue, Research Nurses, Stephanie Rose and Carol Groves explain about how taking part in research is very beneficial to participants. Mr Jim Farrant backs up their claims from his own experience.

Carol Groves appears again in the Five Minutes With story. Sadly, we say goodbye to Carol who is taking time away from the bustle of the hospital to embrace her love of gardening. Carol has made a huge contribution to our studies over the years, with her depth of knowledge and her caring, ever-ready smile. I have heard a whisper that Carol will come back from time to time... so perhaps we haven't lost her yet. We wish you well Carol for all your future ventures – not least the self-sustainable, hunting, fishing and gathering!

It never ceases to amaze me how very creative people in the medical profession can be. Professor Greg Jones of the University of Otago in Dunedin, devised a way to use coloured resin for depicting heart vessels. He produces model hearts that are a true work of art. They are used to teach medical students and junior doctors. We meet Greg in this issue.

Knowing about risks of heart attack doesn't stop you from having one. Ambulance driver Sharon Duthie found herself the patient in her own ambulance when she arrested while on duty. She is now a participant in the MENZACS study, looking into genetic risk factors that play a part in heart attacks and angina, across a range of ethnic groups. Sharon's dramatic story was featured in the media and we tell it here.

Well done to the CHI team who took part in the Christchurch City2Surf run/walk in March. Keeping active is a key element to heart health and the team do a great job in demonstrating that. With winter looming again, I encourage you all to keep active and eat healthily to help carry you through the months ahead.

Professor Mark Richards

Five minutes with.....

Research Nurse Carol Groves

Nestled between the Christchurch Hospital main entrance and the Otago University Christchurch foyer is the Nicholls Clinical Research Centre. Study participants visit the centre for their study clinics, including blood pressure and ECG checks. Blood samples are taken and sent to the relevant laboratory for analysis. For Research Nurse, Carol Groves, the centre has been her work place for the past three years but she is leaving soon – retiring to focus on gardening.

Here we meet Carol and find out more.

What is the role of a Research Nurse?

A CHI Research Nurse recruits participants to a particular study usually from the Emergency Department or as inpatients. Participants receive personalised care from the point of recruitment all the way through a study. Medical checks are carried out at each scheduled visit.

How did you start your nursing career?

I began as a Nurse Aide at Nurse Maude Hospital as a Saturday job when I was 16 years-old. After leaving school I was accepted to Princess Margaret Hospital for nurse training and became a Registered Nurse in 1983.

What brought you to the CHI?

I first worked with the CHI eight years ago for about a year. I had experience in Coronary Care and Emergency and wanted to make the link between research and clinical care. I returned to the CHI three years ago after many years in the Christchurch Hospital Emergency Department, including five as nurse educator.

What opportunities has nursing given you?

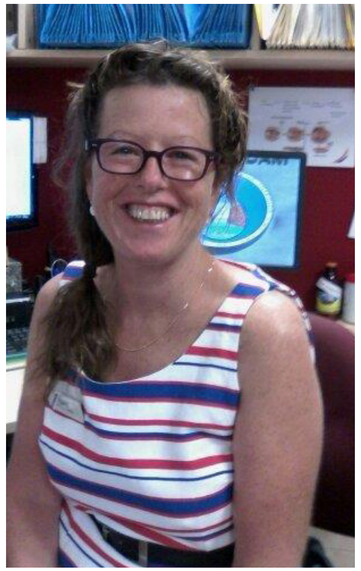
Number one is travel. I spent three years in various London Hospitals and finished my time in the UK at the Royal Tunbridge Wells Hospital in Kent, working in Intensive Care and the Coronary Care Unit. It was before the Berlin Wall came down. I cycled around Europe for three months, through Belgium and through Eastern-Block countries to Bulgaria. It was disconcerting dealing with armed guards at border controls and the squat toilets were disgusting!

Later in my career I spent two years on cruise ships. The best day of my life was sailing through the Panama Canal. It was unforgettable – stunning scenery and the lock system, used to move ships up through the river levels, was very exciting. Another route took us from England to Russia via Sweden and Estonia. I will never forget the beautiful architecture and depth of history.

What was life like for a nurse onboard?

Nurses got more privileges than other staff such as bedroom stewards. It may have had something to do with the fact that one of the nurses was romantically involved with the ship's captain! We all had permission to have meals in the captain's quarters.

I don't like helicopters and I always said, if I had to take a patient to shore by helicopter that would be the end of my cruising days. Inevitably that day came. I accompanied a patient to land in a US Coast Guard helicopter, having been winched up crouching in a basket. Because the cruise ship had a schedule to keep, it continued on its route. It took me three days to find it. A local airport agent put me on flights to Miami, Jamaica and the Bahamas. I caused quite a stir in the airports, carrying the defibrillator machine – they didn't know what it was – so I was under a lot of suspicion!



What do you love?

Being outside in the garden or by the sea, preferably alone. We live near the sea and we have a large garden and our dog, Harry. My time going forward will be taken up tending to the veggies and encouraging my husband in his fishing – we are virtually self-sufficient.

I would ask for a good whisky, ice-cream and chocolate to put down the naso-gastric tube on my last day – I wouldn't taste anything, but I would be happy!!

As you leave the CHI, what thoughts do you have?

The CHI has so much to offer cardiac patients. I hope that more people with heart failure or heart disease take advantage of the specialist medical care offered through being part of research studies. Participants' overall health is taken care of in addition to the normal care – what could be more valuable?

The CHI has grown significantly. There are many studies aiming to reveal important, potentially life-saving information. It has been my pleasure to be part of this.

Just wondering ...?....

How can I manage my risk of heart attack or stroke?

You have an important role to play in your health.

No matter how high or how low your risk of heart attack or stroke, there are always choices you can make to lower your risk. The choices you make every day can change your risk of heart attack and stroke.

Making choices to lower your risk, even small changes, have a positive effect on your risk factors and your overall risk of heart attack and stroke.

- Make heart healthy eating and drinking choices
- Stop smoking
- Move more
- Lose weight
- Take your medications

Did you know

The Heart Foundation website is a great place to find answers to some of your heart health related questions

www.heartfoundation.org.nz

> Making one small change that you're able to stick to is more valuable than making a big change that's hard to stick to. As you get comfortable with one small change, you may like to add another one. Slowly you can start building sustainable, healthier habits.

This is an extract from the Lowering your risk of heart attack and stroke booklet, available on the Heart Foundation website.

Works of Heart

On a shelf in Professor Vicky Cameron's office is something that looks like a piece of art, housed in a glass cylinder to protect it. The heart, striking in its intricate detail, is in fact made of coloured resin.

It is the creation of Professor Greg Jones of the Department of Surgical Sciences at the University of Otago, who works closely with the CHI's Professor Cameron, and who uses these models to teach medical students about anatomy.

Professor Jones casts the models by using donated body parts that members of the public have donated for use in medical research and teaching.

Different coloured resin is poured into the blood vessels or tissue of the body part, which may be a heart, kidney, brain, liver or even a hand.

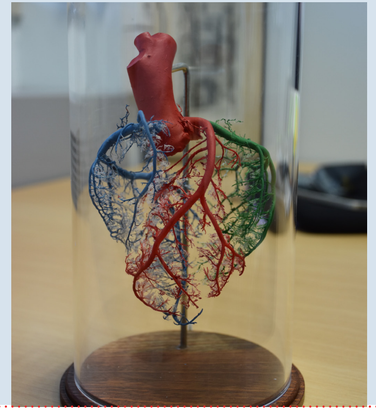
"The idea for this evolved from some research I did many years ago, using it as a way to identify structural defects in blood vessels. The basic technique itself is very old though, having been used to prepare teaching models for anatomy museums for over a 100 years," Professor Jones said.

Whether the model is to be used for research analysis or teaching, determines the type of resin used. Research requires an expensive resin that allows fine detail to be seen, such as the impression of a cell. Cheaper resin is used in teaching aids.

The models vary in their composition depending on what they are being used to teach.

"They may be used to interpret an angiogram (an x-ray of blood vessels), to understand where heart bloods vessels are lying with a 3D view, the normal variations in blood supply to the heart that occur between individuals and for teaching about surgical procedures such as heart bypass or valve repair." More senior doctors such as Registrars are finding the models useful in learning accuracy of needle insertion near the coronary arteries."

Professor Jones gives away his models to teaching Professors and has gifted several sets to the Anatomy Museum at the Otago Medical School.



Diabetes - A pressure cooker

The close relationship of diabetes and heart disease has not gone unnoticed by the CHI team.

In late 2016, a study called Pontiac II began recruiting people aged 18-65 years with Type 2 diabetes and who have no evidence of a pre-existing heart disease. The study, led by Professor Mark Richards, evaluates the effect of full dose heart protective medication treatment, to prevent cardiac events.

Using the blood biomarker, NT-proBNP, the team are assessing who may have a high risk of developing heart disease. Participants are randomly divided into a control group who receive standard care, and a treatment group who receive additional medical intervention. Raised NT-proBNP levels indicate that the heart is under stress and implies extra risk of heart attacks and other adverse cardiovascular events.

The trial is testing the possible benefits of early introduction of heart protective medications in people with both diabetes and raised NT-proBNP.

Study Co-ordinator, Cindy Kim, works to recruit people into the study and carries out health assessments.

"People with diabetes are three times more likely to get heart disease than people without. Having diabetes AND raised NT-proBNP increases risks even higher. Being part of this study offers participants the opportunity to be regularly monitored. Those in the treatment group have health assessments at each visit."

According to Ministry of Health statistics, over 240,000 people in New Zealand are known to have diabetes (the vast majority, 90-95%, type 2). Maori and Pacific Islanders are three times more likely to get the disease compared with other New Zealanders. South Asian people are also highly susceptible.

An estimated 100,000 New Zealanders are unaware that they have the disease.

"Most people with diabetes have high blood pressure," said Cindy, "Those with undiagnosed diabetes or who are in denial of having the disease are at the highest risk of heart attack. One participant wasn't keen to take part at first, but when his friend had a heart attack, he was relieved he had agreed to it. He told me that now he is being closely monitored in the study, he is far less anxious (about his health)."

If you or someone you know have diabetes, are aged between 18 and 65 years without a history of heart events and would like to find out more about being part of this study, please contact Cindy Kim on 03 364 6134 or cindy.kim@cdhb.health.nz.

Fabulous Fibre

Fibre is a nutrition super star. Fibre containing foods help to keep us fuller for longer, stabilise blood sugar levels and even promote HDL cholesterol- the good stuff responsible for removing harmful cholesterol from the body.

Give your diet a fibre make over by including some of the fibre rich foods below. Aim to increase your intake of fibre slowly to avoid constipation, and remember to drink plenty of fluid throughout the day for improved bowel health!

Fibre rich foods include:

- Oats
- Psyllium husk
- Fruits and vegetables (skin on is preferable)
- Nuts and seeds
- Canned lentils and beans

These muesli cookies are high in fibre, and easy to prepare!

Sara Widdowson, Registered Dietitian

Muesli Cookies

125 g salt-reduced margarine
3 tbsp golden syrup
½ cup raw sugar
⅔ cup self-raising flour
50 g All-Bran® Original
1 ½ cups untoasted muesli
1 tsp vanilla essence

1. Preheat the oven to 175°C.
2. Place the margarine, golden syrup and sugar in a medium saucepan over a medium heat and stir until the margarine is just melted and ingredients combined. Add the remaining ingredients and stir to combine.
3. Place tablespoons of the mixture onto two baking trays, flattening slightly. This should make 20 cookies.
4. Bake for 15 minutes or until golden. Allow to cool on trays.