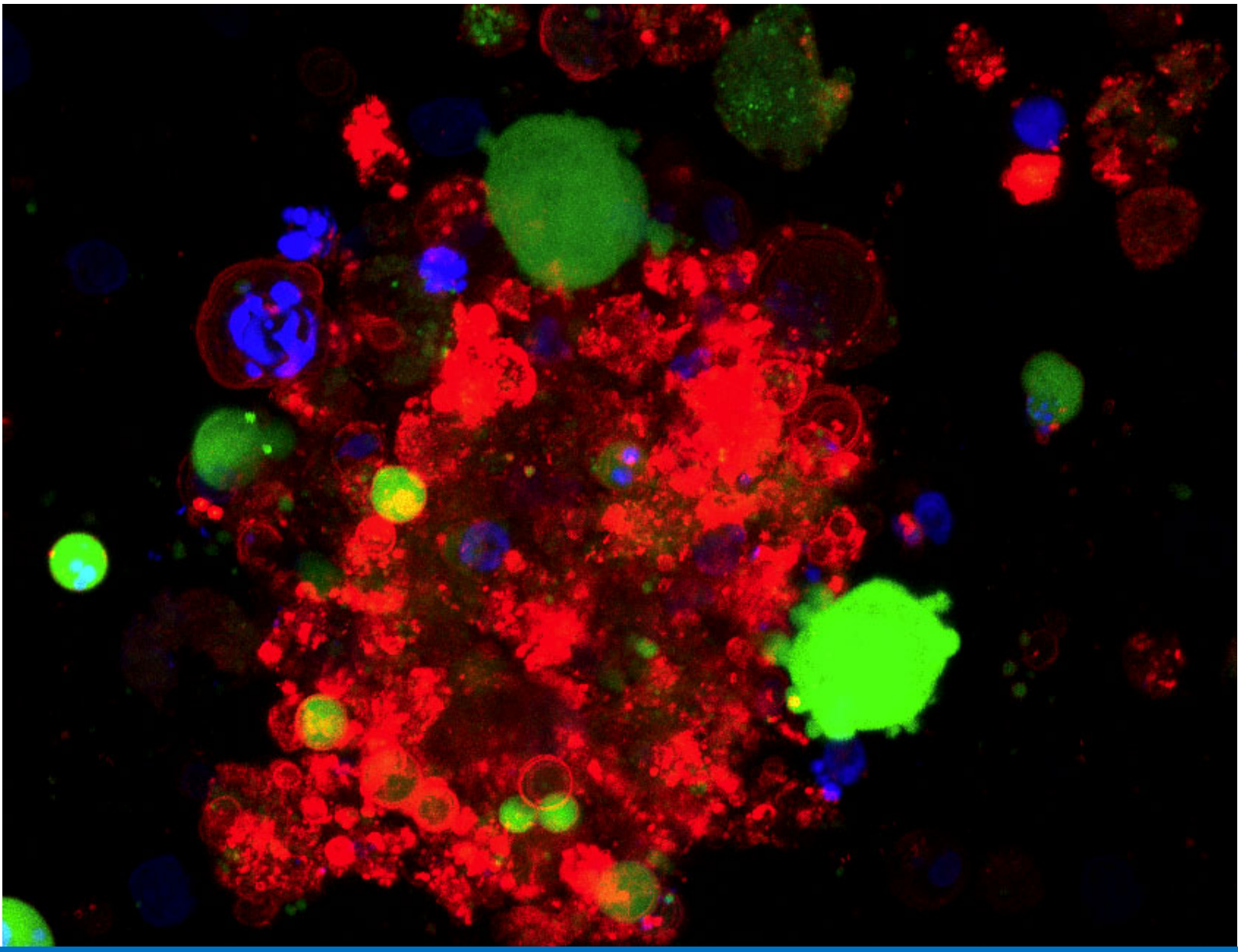

Capital & Coast District Health Board

Annual Research Report 2019-2020

Capital & Coast District Health Board
ŪPOKO KI TE URU HAUORA

Introduction

Clinical Leader Research

This report is a review of the research undertaken by staff at the Capital & Coast District Health Board in 2019 and 2020. These have been "interesting times" by anyone's definition, and the volume and quality of the work documented in these pages reflect the determination of DHB researchers to maintain research outputs in the face of unprecedented challenges.

Andrew Harrison
Clinical Leader Research

The staff of the Clinical Trials Unit certainly had their work cut out to keep trials running during lock-down. The viability of the Clinical Trials Unit and the Research Office is dependent on revenue from clinical trials, and the ability to undertake this research has been challenged not only by the current pandemic, but also by encroachment on the clinical trials research space by patient overflow from the clinical areas of the DHB. At a time when the value of drug development and the need for clinical trials has never been greater, the capacity for the DHB to participate in clinical trials has been critically tested.

The Research Governance Group has continued to meet to provide advice and guidance to the Research Office. This committee is comprised of representatives from across a number of DHB sectors and disciplines, with the aim of encouraging participation from a diverse range of health professionals at all levels of research expertise.

I once again acknowledge the hard work put in by the staff of the Research Office, especially Research Office Manager Marina Dzhelali and Clinical Trials Unit CNM Jonathan Barrett.

Andrew Harrison
Clinical Leader Research

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Research Office

Research Governance Board

Associate Professor Andrew Harrison – Clinical Leader Research, Research Office

Carolyn Coles – Director of Midwifery

Helen Costello – ADON – Practice Development, Nursing and Midwifery Office

Dr. Alwyn D'Souza – Clinical Leader of Haematologist, Blood and Cancer Centre

Mrs. Marina Dzhelali – Research Office Manager, Research Office

Professor Dawn Elder – Professor of Paediatrics, Paediatrics C/S

Dr. James Fingleton – Clinical Leader Respiratory, Clinical Measurement Unit

Cheryl Goodyer – Manager Capability, Whānau

Dr. Scott Harding – Cardiologist, Clinical Measurement Unit

Dr. Amanda Tristram – Gynae-oncologist, Women's Health

Dr. Sarah Jackson – Executive Director, Quality Improvement and Patient Safety Directorate

Dr. Anne O'Donnell – Medical Oncology Consultant, Cancer Centre

Daniel Seller – Physiotherapist, Intensive Care Unit Physiotherapy

Anne Pedersen – General Manager, Quality Improvement and Patient Safety Directorate

Dr. Paul Young - Intensive Care Unit Specialist, Intensive Care Unit

Research Office and Clinical Trials Unit

Clinical Trials Unit Team Members: (Top row, L-R) Thorsten Stanley, Kelley Barrett, Jonathan Barrett. (third row, L-R) Li Feng, Marina Dzhelali. (Second Row, L-R) Geraldine Pinlac, Natasha Eagle, Bronwyn Davies, Preeti Pathak. (Front Row, L-R) Beverly Scott, Tess Ostapowicz, Donna Wylie.

Wellington Hospital's Clinical Trials Unit (CTU) is a dedicated clinical research facility and is part of the Capital & Coast District Health Board. Patients and community volunteers have the option to participate in a large variety of modern medical treatments. These trials are run according to robust trial protocols, involve increased consultation supervision, and commonly offer treatments not yet commercially available.

The 14-bed unit is the first to be located in a New Zealand public hospital, offering unprecedented access to the state-of-the-art facilities of a major regional institution, including radiology, intensive care, library, and pharmacy services. We conduct both inpatient- and outpatient-based research programmes. The CTU has access to a wide range of clinical specialists and networks for single-centre and multi-centre clinical research trials. Researchers are able to continue medical studies overnight, allowing closer monitoring of participants for longer periods and significantly enhancing

the potential scope for clinical trials. The CTU department also provides a tailored casual pool of Research Nurses to support long-term inpatient care.

The Clinical Trials Unit collaborates with number of global pharma and device companies, including international and national collaborative groups, which support and expand research projects available to our community. CTU staff are experienced in Phase I - IV studies in a variety of therapeutic areas, including diagnostics and device studies.

Year 2020 was a challenge to all of us in New Zealand and world-wide. Our unit has adapted quickly and effectively to supporting participants through Covid-19 precautions and isolations, continuing to provide optimal care through the current pandemic. A variety of measures taken; home visits, remote visits, and inpatient isolation precautions, and protocol amendments to ensure trials are continued, and conducted safely and effectively for our participants.

Jonathan Barrett
Charged Nurse Manager
Clinical Trials Unit

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Allied Professions

The Allied Professions (Allied Health, Scientific & Technical professions) work across the continuum of health services and are key contributers to research activity that aim to improve clinical outcomes for our communities. As evidenced throughout the annual report the research is varied covering areas such as stroke rehabilitation, self-management approaches for chronic pain, focussed areas within Genetics and more.

With a priority for us all to contribute to achieving equitable health outcomes for Māori, it is great to read the showcasing of Dr. Hemakumar Devan, a trained Physiotherapist who is working in partnership with our DHB Chronic Pain Management service, Maori Providers and Maori consumers to undertake focussed research on the development of a Kaupapa Māori pain program. The delivery of the pain management interventions based at the marae and led by local Māori providers is a first of its kind in New Zealand. We look forward to seeing the outcomes of this research.

We will be working to support our workforces to increasingly engage in research opportunities and ensure equity is at the centre of on-going research.

Rehabilitation

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Genetics

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Mortuary

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Radiology Department

Our registrars are required, as part of their training, to aim to publish a substantive piece of research. This must be submitted to a peer reviewed journal or presented at an international meeting prior to the end of their training.

Ongoing projects:

Oliver Evison and Hannah Kim - A retrospective audit assessing the correlation between ACR TI-RADS criteria of thyroid nodules and FNA cytology results

Ray Li and Hannah Kim - Endometrial cancer audit on the sensitivity of MRI in the differentiating between FIGO 1A and 1B disease

Jonathan Bong and Hannah Kim - Retrospective data analysis on all malignant neck biopsies that came through to the lymphoma and head and neck MDMs

Matthew Page (co-author) - INFOMATAS: Integrative physiological assessment in acute ischaemic stroke

Mathew Page (awaiting ethics) - A retrospective observational study of intracranial major artery disease in a single stroke centre in New Zealand, comparing rates of intracranial stenosis amongst different ethnicities.

Missa Amin (collaboration with Joe Feltham and Rodney Wu at Pacific Radiology) – The impact of 18F-PSMA PET/CT on management intent of prostate cancer patients: a retrospective study.

We are working in partnership with other departments and the University of Otago to provide necessary imaging for ongoing research.

We are committed to ongoing research and welcomes any assistant you might be able to provide in order to facilitate this.

David Healey
Clinical Co-leader of the Radiology Department
Paediatric and General Radiologist
Radiology Department

Anaesthetics and Pain Management

The Department of Anaesthesia and Pain Management undertakes research projects that are investigator initiated, and others that are essentially data-collection as part of large multicentre collaborations with other groups around the world. The investigator initiated research projects include investigations that are managed within the Department of Anaesthesia and Pain Management, and others that are via the collaboration with the Intensive Care Unit and the Medical Research Institute of New Zealand. Both of these avenues of research have engaged successfully with the ANZCA Clinical Trials Network. The research activities fall under the final responsibility of the Clinical Director (Dr Sally Ure) with operational responsibility for planning, approval and oversight delegated to a Research Committee (Sandy Garden (Chairperson), Marina Dzhelali, Matt Levine, Phillip Quinn, Romilla Franks, Linda Zhou). We continue to receive excellent support from Marina Dzhelali and the CCDHB research office and a number of our projects have made use of the Statistical Clinics, with Advice from Dr Lisa Wood, School of Mathematics and Statistics, Victoria University.

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- **Frei DR,** Beasley R, Campbell D, Leslie K, Merry AF, Moore M, et al. (2019). Practice patterns and perceptions of Australian and New Zealand anaesthetists towards perioperative oxygen therapy. *Anaesth Intensive Care.* 47(3):288-94.
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- Weller, J., Long, J. A., Beaver, P., Cumin, D., Frampton, C.**, Garden, A. L.,** Moore, M., Webster, C. S., & Merry, A. (2020). Evaluation of the effect of multidisciplinary simulation-based team training on patients, staff and organisations: Protocol for a stepped-wedge cluster-mixed methods study of a national, insurer-funded initiative for surgical teams in New Zealand public hospitals. BMJ Open, 10(2). https://doi.org/10.1136/bmjopen-2019-032997

Listed as site investigators and collaborators in large multicentre trials:

- **Dalley P** in : Wijeysundera DN, Beattie WS, Hillis GS, Abbott TEF, Shulman MA, Ackland GL, et al. Integration of the Duke Activity Status Index into preoperative risk evaluation: a multicentre prospective cohort study. Br J Anaesth. 2020;124(3):261-70.
- **Garden A, Franks R, Deiterle J** and Barrett J in: Short TG, Campbell D, Frampton C, Chan MTV, Myles PS, Corcoran TB, et al. Anaesthetic depth and complications after major surgery: an international, randomised controlled trial. Lancet. 2019;394(10212):1907-14.

Active Research Grants

Erythropoietin to improve outcome for critically ill trauma patients
Host: Medical Research Institute of New Zealand
Approved budget $ 1,199,020
Personnel Colin McArthur, Alex Kazemi, **James Moore**, **Paul Young**, Ross Freebairn, Seton Henderson, Ian Civil, Craig French.

Featured Researcher – Daniel Frei

Dr. Daniel Frei
Anaesthesiologist, Consultant

Tell us about your research and your research experiences?

The research that I am mainly involved with at the moment is investigating the impact of how much oxygen we give to people during and immediately after surgery – on their post-operative recovery. The background to the research is that there are competing views on whether oxygen is good or bad for post-operative recovery. The World Health Organization have issued a guideline in 2016, suggesting that for patients having surgery under general anaesthesia should get 80% or more oxygen for the duration of their operation, with the aim of reducing infection after surgery.

Is that the same thing that your research is about?

Yes, the research is looking at this question from a number of angles. We started with a review of the literature to determine what's already known about the impact of oxygen exposure during surgery on postoperative outcomes. We have completed a survey with anaesthetists throughout Australia and New Zealand to see what their views and practice is with regard to intraoperative oxygen therapy. I am currently collecting data for a prospective observational study that is aiming to quantify how much oxygen anaesthetists actually give to their patients during surgery. I am simultaneously performing a retrospective database study that is seeking to establish a link between intraoperative oxygen exposure and post-operative outcomes. The final part of this initial body of work is a feasibility randomized controlled trial, where we have randomised patients to either a higher/lower or intermediate level of oxygen to see whether it is feasible to conduct a large scale randomised controlled trial. The aim is to expand that feasibility study into a large randomised controlled trial over the next few years.

When did you start the study?

The Hospital Operating Theatre-Randomised OXygen (HOT-ROX) study is the randomized study, and the feasibility phase has now completed recruitment. We started recruitment in approximately June of 2019.

What is innovative about your research, especially relating to HOT-ROX?

I think that probably the most novel thing about that study is the primary outcome measure we have chosen, which a metric is called 'days alive and at home'. It is a primary outcome that captures the patient-important important effects of post-operative complications. Rather than looking primarily at whether a patient develops a complication after surgery, it looks at whether the

complication reduces the amount of time the patient is able to spend in their own home within the first 30 days of surgery. It is not just about recovery out of hospital, but recovery to their previous level of independence.

In terms of comparing this to all of your research, which do you think is the most significant research you have accomplished so far?

All of the studies that I have described so far are looking at this issue of perioperative oxygen therapy from different angles, and they therefore each have a slightly different purpose. Ultimately, all of these studies lead to a prospective randomized trial, which is the gold standard for generating the evidence that is going to potentially enable practice change. That is the gold standard study that we are working towards and that is the one that is most likely to have an impact.

How do you manage your time between being a clinician, a researcher and having a family time? How do you balance your time in all of these things?

Yes, it has been challenging, particularly because I have been away on a clinical

"It's hard not to take it personally when your work is rejected or criticized. But every rejection is a learning opportunity. So you just have to view it as such, and keep persevering."

Dr Daniel Frei

fellowship for the last year. We spent 2020 in Melbourne and I was doing a cardiac anaesthesia fellowship. Coming back to work here is Wellington as a consultant. It has been a bit of a transition, which can at times be a bit demanding. The Anaesthesia department have given me non-clinical research time, which has been extremely helpful. They have demonstrated that they value and they are prepared to prioritize research, which clearly I think is really important, and something I am grateful for.

What influenced you the most to choose your current field in research?

I have had really strong mentoring from Paul Young, and Richard Beasley. Through the Wellington ICU research program and the Medical Research Institute of New Zealand (MRINZ) – their guidance and support has been absolutely crucial, both in terms of identifying an important research question, helping me understand study design, and helping me make connections with other researchers throughout New Zealand and Australia. I went to the Alfred Health, because Paul Myles, who is a prominent anaesthesia researcher, is based there. The MRINZ has this program of work that has investigated the impact of oxygen therapy in various clinical scenarios. In some ways, this perioperative work was a natural extension of some of the other work that they have been doing. As an anaesthetic clinician, it is a question that I think is important, and it remains unanswered. If you think of all the treatments we administer to people under anaesthesia– giving oxygen must be the most ubiquitous. Even if the impact of different strategies of oxygen therapy on post-operative outcomes is modest, once it is applied to 10's of millions of people across the globe it has the potential to have quite a big impact on global health.

What has been the impact of your research to you as a person or as a clinician?

I think that being engaged with research and doing your own research, inevitably means that you are more up to date with your own specialties evidence-base. You are more exposed and aware of the other research that is going on. You tend to anticipate and be aware of other trials as they are published. I think that helps keep your practice up to date, which can be a real challenge in clinical medicine.

In terms of how it has impacted me personally, I think that every educational pursuit has grown me in terms of my capacity for, I suppose, intellectual tasks, but also just my ability to focus on things. I guess also my understanding of what one can achieve if you apply yourself to something. It is something that at the outset seems extremely difficult. But as you walk through it, you learn that steady and sustained effort leads to results.

Do you want to comment on how your research is contributing toward the community?

I think there are significant indirect benefits from most research. We know that patients who are involved in research studies tend to get better care than patients who are not. There is also evidence that institutions that are actively engaged in research, tend to perform to a higher level than institutions that aren't actively engaged in research. I also think part of the bigger picture is about developing research infrastructure, and capacity. Given that our specialty interfaces with a lot of other surgical and procedural specialties, there will potentially be many opportunities to collaborate and share resources in the future. Hopefully, I'll eventually have the ability to mentor other people who are keen on research in the same way that Paul and Richard have done for me – developing people in the organization who will acquire the skills that are needed to do research is also very important.

So what are your future goals in terms of research?

Well, my immediate goal is getting my thesis written and submitted as soon as possible. I am focused on building our research infrastructure.
This means getting more people in the anaesthesia department excited about research and on board with projects. There is already a great foundation of research culture in the anaesthesia department that we can continue to build on. The more we do, the more visible we are, the more people see results. If people feel part of the process, then that culture starts to build, and people start to expect research as a part of their daily practice, as opposed to seeing it as an add on extra.

If you can impart something you have learned in your academia journey? What would you want to share to the incoming students or your fellow?

I think the most important qualities to foster for a career in research are thick skin and perseverance. It is often challenging and takes longer than you think it is going to take and you will suffer setbacks. Unfortunately, a lot of people have a go, and do not succeed at first and then feel like it is too difficult. It is hard not to take it personally when your work is rejected or criticized. But every rejection is a learning opportunity. So you just have to view it as such, and keep persevering. Of equal importance in my view for developing a research career, is finding great mentors within your planned area of academia. If I could single out one thing that has been the most helpful to me, it would be linking in with the mentors that I have.

-End of Interview-

Featured Researcher – Dr HemaKumar Devan

Dr. Hemakumar Devan
Research Fellow
Physiotherapist

Tell us about your research and your research experience? What is it about and when did you start?

I am a physiotherapist by training and registered in New Zealand. I trained as a physiotherapist in India, worked clinically for three and a half years, and then moved to New Zealand 10 years ago to do my Master's degree in Physiotherapy. I specialised in manual therapy (musculoskeletal physiotherapy) which is quite hands on. I had to do a research project as part of my degree and because I have worked clinically with people with amputation and as an amputee physiotherapist, my research question was on how common was back pain in amputees. I luckily to receive some funding from the New Zealand Artificial Limb Service (NZALS). I was thinking of doing a national survey to find out how big the problem is and it turns out this is something which would be helpful for us as a service in terms of how we provide services for people with amputation. NZALS were happy to support my research proposal and I felt quite fortunate in receiving the funding.

With the help of NZALS, the dissertation was well received and we got a good survey response across New Zealand.

I was also able to receive a scholarship for my PhD after getting a distinction in my Masters Dissertation. It was a critical point in my career, where I could have completed my Master's degree and gone back to do more clinical practice or to return home to India, but I knew my long-term career goal was to be a clinical researcher. I decided to do a PhD, in order to learn more about back pain in people with amputation, and to look at whether there is a link between asymmetry related to amputation and back pain. I also wanted to find out if people with more asymmetrical movements experience more back pain.

Following my PhD, I got a postdoctoral fellowship at the School of Physiotherapy based in Wellington. I moved from Dunedin to Wellington about four years ago and started working in collaboration with the Pain Management Service here at the Wellington Hospital, to look at the existing pain management program. This was another critical point in my career. I was thinking that i would be an amputee researcher all my life. But then my first research project at the Wellington Pain Management Service changed my perspective. As a physiotherapist, I thought, you would have to have an obvious physical disability, to have pain and I thought that helping people with physical impairment in terms of managing their pain can help to manage their disability and improve their quality of life. I actually sat in one of the group pain management programme for 12 weeks and realised that one does not have to have a physically impaired to suffer. For the chronic pain patients, there is suffering at all levels like personal, psychological, social and

emotional due to their pain. The gradual progression of patients through the 12 weeks was completely transformative. This experience inspired me to start looking at chronic pain as a whole, not necessarily back pain. Chronic pain is quite an umbrella term – it includes back pain, fibromyalgia, post-surgery pain and endometriosis etc. On further reading, I realized there is so much that could be done in terms of helping people to self-manage their chronic pain and that is how my research interest in chronic pain started.

My current research programme has three main themes. The first theme is around technology and how technology can support patient's self-management of chronic pain. This includes online resources like apps, websites, online peer support, social media forums, and remotely delivered telehealth. Therefore, when I look at technology, I also have a lens of making it more culturally appropriate. The available online resources are targeting specific population. It is not representative of the diversity that we have in New Zealand. The technology can potentially address barriers in terms of access and but it can also create a lot more inequalities because it is not representative of New Zealand population.

The second theme is on working with indigenous and culturally diverse communities to address inequities to pain management. I feel that in clinical practice, clients are not necessarily representative of who needs it most. For example, Māori have the highest chronic pain prevalence, but number of Māori patients we see referred to hospital are pretty low. I have started to engage with whānau at the Tu Kotahi Māori Asthma and Research Trust based in Lower and we have realised there are so many barriers for the Māori whānau to even seek help for their chronic pain. There is a lot of stigma in terms of expressing, communicating, and seeking help for chronic pain with a primary care provider. If they see a GP they would be primarily managed with pain medications. And although pain medications have a role in chronic pain management, it is not the only resource available to us. In collaboration with Tu Kotahi whānau, I am currently working to ensure that the pain management program and the pain services are equitable for all people, particularly for people with high unmet needs, such as Māori. In the future, I wish to expand this mahi with Pacific and Asian communities, who are also under-represented in referrals to pain services across New Zealand.

The last research theme aims to improve societal representations of people with chronic pain in New Zealand. I want to explore how chronic pain is portrayed in society. For example, reports from the last five years suggest that chronic pain is often portrayed as a disease of suffering and I would like to change those kind of social narratives, because I believe that chronic pain is an invisible illness and there is a lot of stigma attached to it. Taking a societal lens in pain, I want to see if we can educate the society about the experience of someone with chronic pain, and that in turn might help the person to communicate more effectively about their experiences, but also would allow for others to support the person dealing with pain.

When you say societal views, do you mean that different pain threshold of different people?

If all three patients have chronic pain, for example I might have arthritic pain, you might have fibromyalgia and another person might have endometriosis. My pain pattern might be up and down. You might have more fatigue and pain and the other one, might have a period pain because of endometriosis. Regardless of the type of chronic pain, the suffering is the same. The ongoing nature of pain and associated stress is the fundamental problem with chronic pain. By definition, if

the pain persists beyond a short period where it should not and the brain misinterprets some of the incoming information from the body, it could lead to brain using pain as a protective response.

This scenario makes complete sense, for example if someone has an acute ankle sprain, they have to rest for their body to heal, the pain goes away, and then they can start walking and doing things. But in a chronic pain situation, some of the incoming messages from the ankle will be misinterpreted by the brain and the brain has dysregulated neurological protection system with chronic ankle pain as a protective response. In this scenario we would encourage a person to move and try to return function to the ankle. For others, chronic pain might make them react with statement like this: *'oh, you look completely fine, why are you laying down or why do you want to take rest?'* Or '*why do you want to take a day off of work?*' It is critically important for someone in pain, it is harder for them to communicate in terms of what they want and how they are feeling. Communicating pain to others seems to be quite a challenge.

What influenced you to choose your research in physiotherapy, and from then on to just move on from where you are right now?

Pain is one of the common reasons where patients come to see a physiotherapist and again, the types of pain that people come in to see a physio will be more often due to acute pain situations like back pain, or an acute ankle sprain. We might help them to do some exercises or strapping or education. But with chronic pain, the type of physiotherapy that I do now is a lot more about educating the patient around why do they experience chronic pain, what is the difference between an acute pain and chronic pain and why resting would not helpful when someone has chronic pain. Even though they may have pain, I might ask them actually to do some more activities. So I think that where it is a bit more different from a usual physiotherapy practice to a specialised physiotherapy focusing on pain management. The work that I do now as a pain management physiotherapist is a lot more interdisciplinary. For example, I work with a team of pain specialists, psychologists, occupational therapist and it is a team-based approach which I enjoy the most.

As a pain physio, I focus on helping someone to improve his or her function despite the pain. As we know, the pain can make someone avoid activities that may trigger the pain. My role is to help to change those beliefs and to make the person understand the relationship between mind, body and movements.

Is there any specific research method that you have used for your current project right now?

I am working on two main projects. Firstly, I am funded by a 1-year the HRC, Health Delivery Career Development Award. With this fellowship, I am able to do two days of clinical practice at the CCDHB, Pain Management Service. I have started my clinical practice as a pain physio earlier this year. For the other three days, I work with the Tu Kotahi Whānau to co-develop a Kaupapa Māori pain program by, and for Māori whānau. The idea is to train the nurses in the Kokiri Marae, so they going forward will lead that program. The first step is to create the structure and educational resources of the program by the end of the year; the plan is to pilot the programme with a small group of whānau, assessing the clinical and feasibility outcomes.

For the other HRC project, we are doing a randomized control trial, comparing the face-to-face delivered pain management program by CCDHB Pain Management Service to the co-designed online pain management program (called iSelf-help). We have co-designed iSelf-help with patients who have

previously completed the in-person program. We asked them if they want to be involved developing an online version of the face-to-face program and the graduates from the program have agree to help. That is how the co-design journey of iSelf-help started. With eight previous patients who have completed the program, we converted the 12-week program into 12 online modules and currently we are running a non-inferiority randomised controlled trial comparing the version of the programme.

Which do you think is the most significant research you are involved right now?

The journey started with the HRC project grant where we wanted to co-design an online pain management program. We realized that not many people could attend the in-person 12-week program. We thought we could create an online program to enhance access, but at the same time, we have also wished to make this online program more culturally tailored for Māori. By getting feedback from local iwi, we have engaged with the Tu Kotahi whānau. Because of this relationship, we have realised the whānau have not been asked about their chronic pain before and there was a lot of whakama when to talk about chronic pain and when they go to GP. Then we had to take a step back and realised we can not ask someone who has never heard about this pain management program or never referred to a pain service to give some feedback on the program. I would say the journey led to doing another small project where I went back to the whānau and asked them *"Tell me what do you want"* and *"Let's start from the scratch"*. We found out some of the key barriers such as access to pain services, whānau said that they do not have the money or the transport or the time to come to a pain clinic because this means that they have to be referred by a GP and there is usually a long waiting list for the pain service assessment. The whānau said, "*Why do not you make a pain specialist come to the marae, and we could do could run a marae-based pain clinic*." The kaiāwhina (community workers) also suggested that we run a support program for cancer patients, which happens in the marae every month. It is run by the community workers and the nurses here. "*Why can not we have something similar for chronic pain?"* and that is how we have started. So the ideas and solutions all came from the community. I was able to secure some funding and the pain service here in CCDHB is so supportive to organise the marae-based pain clinic in Kokiri, which is the first ever initiative in New Zealand.

What was it like to apply for the HRC grant?

My wife and kids went to India at the time, which meant that I could spend full time on writing the full application, which is 12 pages long. It was essentially writing the whole co-design part, and then the trial part. Then the last part is the dissemination. The total amount of the grant is 1.2 Million; I would have spent a good two months working 50 hours a week writing it, which includes getting feedback and polishing it. It was incredibly challenging at the time, because I have not wrote any project applications before.

For the HRC Career Development Award, it was a new fellowship that was announced early last year; it was about 3-pages. I did not know what to expect, because the way the application was set was for clinicians to do a funded research placement and not the other way around. I was a full-time researcher, wanting to do a funded clinical placement in pain service. Applying for this fellowship was an exit plan for me because I knew securing funding is getting more and harder and I thought if I get this fellowship, if I get trained as a clinician again then that would mean I can become a clinician. In a way, I am lucky that I could do both clinical and research, which is my long-term career goal. In an ideal world, I wish I could continue with research for the rest of my life, however, the fellowship ends by the end of 2021.

In the last 4 months of my clinical placement at the Pain Management Service, I already applied for a couple of grants through HRC and Rutherford Discovery 5-year Fellowship. I think that is the beauty of being a clinical researcher. Being in the pain clinic, we realized that opioids is a big problem for people with chronic pain and we had patients who walked away when we started talking about decreasing opioids. They were quite upset, because they think that we are taking away their pain relief options. I think that is what opioids do, they increase the number of pain receptors in your body long-term. This means that taking more medication over a period of time, the pain goes up as well. In case of opioids, it is the opposite; the pain actually goes up with long-term opioid use. It also makes it so hard for them because of the withdrawal symptoms and the extensive tapering support it requires. Currently there is no primary research in New Zealand on opioid tapering for people with chronic pain and we know that opioids for people with pain is a big problem. There is no primary research in New Zealand and the pain team were supportive of this proposal. The idea of this project is to go back to people with pain who have successfully tapered their long-term opioid medications. We want to gather the tapering journey in terms of what worked and what did not. We want to use their stories as an intervention for people who are on long-term opioids as a conversation starter in a clinical setting. Because if it comes from a patient, it is different – a completely different tangent.

In terms of methodology, I am a firm believer of co-design or a participatory action. All of my projects are co-designed or community-based participatory research. So even the tapering of opioids treatment came from the pain team. I then reached out to other patients who finds it a challenge to reduce opioids intake, as they do not know how to do it. It is a similar challenge for whānau at the Tu Kotahi, where we found out that whānau were pretty much managed by medications including opioids. I also reached out to Global Pain Patient Advocates (GAPPA), an advocacy organization and they have the same sentiments as I do. They said they'd be happy to support my opioid research. In conclusion, everyone said this is worth exploring and they all have given nice letters of support. We are hoping that we will get through the next stage and part of the idea is to get my EFT budgeted in the project.

What do you think is innovative about your Behaviour Intervention Technologies aside from the three themes that you have already discussed?

I think the innovative about this is having a strong focus on people and the whānau. I really want to answer real-world meaningful questions that matters to whānau living with pain. I do not want to use the word *patients*, I would refer to them as people/whānau living with pain and the research is person/whanau-centred.

Another key innovation is that my research program is translational. Even though questions came from patients, unless it is translated into clinical practice, there is no point. For this opioid project, through my links from other tertiary pain services (Auckland and Waitemata), who also wrote letters of support and will be on board on the project. Overall, a strong translational aspect and whānau/person-centred, participatory aspects will be the two things that I feel innovative about my research program.

How do you deal with conflicts or disagreement within research group? Have you ever had any big issues in terms of your research? How do you deal with it?

For the HRC project, it was co-design between various disciplines. There were researchers, patients who have previously completed the program, clinicians from the pain service, then we had Māori researchers

and community partner along with Tu Kotahi whānau, and then we had the technology design team who were actually designing the online program. Then we also had a health literacy expert who reviewed all the contents to ensure that whatever we wrote is not too technical. So that is a large team of people from various backgrounds.

We actually wrote a recent paper, sharing our experiences of co-designing our online pain program (iSelf-help), and this *"team based approach"* had challenges along the way. We could not find a common data-sharing platform across the parties. Two years ago before we had Microsoft Teams, the university have access to Teams, but then the DHB did not while the technology guys worked in Google Drive. Imagine that the technology team are going to produce contents, the clinicians are giving contents and researchers are making sure everything is in one place and then the Māori researchers and whānau are giving some feedback on the contents. Essentially, we had no shared platform. We had multiple emails, multiple meetings and clinicians were worried where we are with all this content creation process. In the end, we had co-created 140 contents, including videos, animations, interactive texts and all sorts of things. It was a complete chaos. We reflected that the system is not designed to work together. Even to come up with a common data management platform was a nightmare at that time.

I'd have to say that the fact that we have had this problem before COVID, meant that the clinicians were so prepared for the transition to providing clinical services via Zoom by the time COVID lockdown was announced.

Lastly, people's understanding of co-design varied at the beginning and throughout the project, which was one of the key reflections. From that experience, what I do now is to set the expectations to an extent, upfront, and to expect setbacks as we go through and if we prepare for that from day 1, people are inadvertently ready to face any adversities as it comes during the co-design process. It is responsibility of the researcher to make sure the team remain curious and not anxious as a collective.

How do you think your research affect the DHB? Or the community in general?

The HRC project is directly changing the way how services are delivered. There was an in person program then it was turned online, that is currently under trial, and hoping for it to become routine practice. We already have several patients saying, "*Can I do online instead,"* but we cannot do that as the program is still under investigation which upset other patients. This also helped the clinicians to reflect and revise the existing contents of the pain program and that is an improvement in the project.

From an equity perspective, the fact that we are able to deliver the services to the Māori community by taking a pain specialist to the marae is a change in service delivery and addressing CCDHB's Taurite Ora – Māori Health Strategy (2019-30). We identified that whānau were not being referred to pain service and our project is directly trying to get whānau referred. We have also encouraged nurses in the community because they are the ones who go out to the whānau and they know their health and social aspects of life. In a way, I feel the proposed health system changes will focus on strengthening existing community-based health services.

I feel our program is a prototype for community-based and are whānau-focused health care delivery. Also, if we upskill, those nurses and social workers in the whānau ora collective on how to identify chronic pain and who are suitable for referral to a GP or a tertiary service, then we are essentially managing the pain management early on.

What do you think gives you a competitive edge in this area? Especially, you are applying for different funds?

I feel chronic pain as a research area is underfunded with high-unmet needs. The prevalence of chronic pain has been around 20% over the last five to six years. Based on the data from the National Health Survey, conducted yearly . In Māori, prevelance of chronic pain is around 22%, so it is quite disproportionate. We also know from an audit of pain services across New Zealand that Māori, Pacifica and Asian communities are underrepresented in any of the tertiary pain services across NZ. There needs to be more work done in terms of funding and support for those groups at clinical, community and at a societal level.

Have you ever supervised a doctoral candidate or any Master's students by any chance? How do you find that experience?

I have supervised short research projects of undergraduate physio students and postgraduate as part of their Master's degree in Physiotherapy. I usually try to find out their interest in terms of where they are working and what their clinical interests are, to come up with a research question. We often end up doing a systematic review or a scoping review. I have supervised five group research projects of final-year physio students. For group research projects, I can actually decide the project topics, I have done many chronic pain projects, and they are efficient and passionate. We have published quite a few papers from those group projects, and from my Masters' students. I have not supervised any Master's thesis or PhD students, mainly because I am always on a short contract. To be able to supervise someone, you need an academic position or a long-term research funding. I would love to supervise Masters and PhD students and I have had few people who are interested and wanting to do further research in pain topics. For example, one of my Master students wants to do a PhD project on Pacific people's experiences of pain and how they self-manage.

How do you balance your time between being a researcher, a council member, social media blogger, and family time?

I have to ask my wife that. I often end up overcommitted and end up running late to meetings. I really feel there needs to be so much done for people with pain and I always try to separate myself from the work that I do. If things do not go well, I always try to learn from it to avoid those happening in the future. I think from a career pathway perspective, I feel that allied health professionals do not have that career pathway that links research and clinical. I would really like to see, either the university or the DHB, taking a leadership role in advancing the careers of Allied Health Workforce. Because if the profession have to develop, one needs to develop the workforce and you can not just expect clinicians to do research, because they do not have the time to do it. So I feel there needs to be onus collectively from the DHB and the University to recognize the mahi that clinical research carries, the impact researcher has and to support and nurture those people for it to be sustainable. I am hopeful that this situation will change.

-End of Interview-

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Emergency Medicine

Wellington Emergency Department boasts a strong research network, involved in collaborations with Otago Medical School, MRINZ, Wellington Free Ambulance, Wellington ICU and General Medicine, Hutt ED, and NIWA.

Contributing significantly to ED research are Dr Alice Rogan and Dr Emma Carlin. From late 2019 Dr Alice Rogan commenced the one year role as a Research Fellow with the Department of Surgery & Anaesthesia while she works towards her PhD in Emergency Medicine Research. Dr Emma Carlin has subsequently taken up the same role – Alice and Emma are the first and second ED trainees to be selected for this position.

In June 2019 a dedicated research nurse position was created in the ED, established following the HRC grant received for the MANDATE asthma study. Supported by MRINZ, the role is funded up to 1.0 of shared nursing FTE. With the study expanding to recruit in Hutt ED, it is hoped that this will help strengthen research ties between the two departments.

Also notable is CREW (Clinical Research Emergency Medicine Wellington) – a research network for RMO's and nurses in the ED interested in research, who have involvement in projects ongoing in the department.

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Research Projects Ongoing:

- Biomarkers and their Relationship to Acute Brain Injuries in the Emergency Department. The BRAIN Study. Lead investigator **Dr Alice Rogan**, completing this as part of a PhD thesis. Multi-centre observational study endorsed by ACEM.
- Does weather influence presentation rates to the emergency department? Lead investigators: Dickinson E, **Rogan A, Peckler B** & NIWA Investigators. A collaborative research agreement has recently been established and approved by HDEC to begin this project.
- ED waiting room survey about education and waiting times. Lead Investigators: **Peckler B, Rogan A**, Murphy S, Galawanker S. This binational project is being conducted with colleagues working in the USA.
- A RCT investigating the use of a functional orthotic brace for the management of Achilles Tendon rupture. **Rogan A**, Smart H, Florance N & Foley G.

Involvement in other Wellington Free Ambulance (WFA) Studies

- **Aus-ROC** – work continues on analysing and publishing from this Australasian out-of-hospital cardiac arrest database which includes data from **WFA**. Current activity includes establishment of a Centre of Research Excellence boasting a significant research programme.
- **The PATCH study of Tranexamic Acid Treatment** (bleeding in major trauma). Data collection is almost complete; for publication in 2021.
- **Study of Road Trauma Evidence and Data (SORTED - National Trauma Network registry study)**. New projects are under development involving all emergency services, ACC, NZTA, Transport Ministry, and statisticians. Currently, an analysis of road trauma location is underway. Adam Stevenson (ICP, Wairarapa) is the second WFA representative on this group.
- **Impact of prehospital care on mortality from major trauma**. **WFA** and St John are sharing electronic data for this project based at the University of Auckland. WFA has no co-authors.
- **Salbutamol (Asthma) Study**. Linked studies include a randomised controlled trial of adrenaline use in asthma and COPD. These involve linkage with the asthma registry at the Medical Research Institute of NZ. Ethical approval has been granted. Data sharing with MRINZ is the remaining issue and consultation on this is taking place involving the MOH.
- **Oxygen in Acute Coronary Syndrome Study**. This study is now completed. The main finding is that for patients suffering heart attacks, the administration of oxygen is only beneficial if the patient's oxygen level is low. There is no indication for the routine administration of oxygen to these patients. **WFA** staff have been advised accordingly. There is no need to alter WFA Clinical Guidelines as our practice is consistent. The paper has been accepted by the British Medical Journal.
- **COVID-19 and Cardiac Emergencies.** The impact of the National COVID-19 Lockdown on the hospitalisation of patients with acute coronary syndromes in NZ has been analysed by linking the ANZACS-QI NZ cardiology database with the combined St John/**WFA** ambulance database for the same period. Unlike other countries, there were fewer cardiac arrests and cardiac admissions during lockdown in NZ but STEMI heart attacks remained static. The paper was accepted by the Lancet.

- **COVID-19 and Ambulance Workload.** The impact of a National COVID-19 Lockdown on ambulance presentations & demand in NZ has been analysed by linking WFA and St John records. The whole spectrum of ambulance work, including ethnic demand, is included. The paper has now been published in the British Medical Journal (Open Access). Patient acuity, 111 calls, trauma and alcohol-related events declined. More patients were left at home. However, there was a significant increase in calls for mental health conditions. A summary will be issued to WFA staff.
- **Tele-Ambulance study.** Technical problems regarding audio have been overcome with new headsets for the patient and paramedics. Data collection ceased at the end of November and the results of the pilot study indicate that Tele-Ambulance was highly successful for diagnosing stroke, determining the need for reperfusion therapy, and anticipating the need for clot retrieval. The latter was also identified by the PASTA score comparator. A presentation of the results from the Stroke Neurologist has been recorded (slides with voice-over commentary) and is being made available online to staff. It is intended that the Tele-Ambulance service will restart in March 2021.
- **Toxicity of inhaled pain-killer** (methoxyflurane). This is being undertaken by a **WFA flight paramedic** for her PhD thesis. The study continues to progress steadily, in conjunction with Canterbury University, and the first paper on the subject has been published. No toxic levels of the drug have been identified amongst ambulance staff.
- **Use of prehospital ultrasound** – The **WFA flight paramedic** who completed a Master's degree on ultrasound at Otago University is now progressing her doctoral study on critical care ultrasound through AUT. She has started one-to-one sessions with the Director of Emergency Ultrasound at Wellington Hospital and has been appointed as a Lecturer in Ultrasound at AUT.

Research Positions & Committees

- Wellington Emergency Department are co-hosting a BMedSci(Hons) student with the University of Otago investigating the use of biomarkers in concussion. Student: Annabelle Sik. Supervisors: **Dr Alice Rogan, Dr David McQuade** & A/P Peter Larsen.
- Wellington Emergency Department are co-hosting 4 Trainee Intern Research Electives with the University of Otago investigating the clinical feasibility of novel concussion tests in ED. Students: James Cooper, Ben Kaveney-Gibb, Beatrice Stewart & Eden Hawkins. Supervisors: **Dr Alice Rogan, Dr David McQuade** & A/P Peter Larsen.
- **Dr Emma Carlin** is working with the Department of Surgery & Anaesthesia as a Research Fellow while she completes her Masters of Medical Science in Emergency Medicine Research.
- **Dr Alice Rogan** is working with the Department of Surgery & Anaesthesia as a Research Fellow while she completes her PhD in Emergency Medicine Research.
- **Dr Emma Carlin** and **Dr Alice Rogan** are editors for the Trainee Focus Section of the Emergency Medicine Australasia Journal
- **Dr Alice Rogan** in the Trainee Representative on the ACEM Research Committee for 2020-2022.

Thesis:

- **Lockett, J**, (2020). Strategies and Processes Emergency Department Nurses Consider Important to Safely Manage During an Influenza Pandemic: A Qualitative Descriptive Study. (Master's thesis for Nursing Science). Victoria University of Wellington, New Zealand.

Conference Presentations and Posters:

- **Rogan A**, **Lockett J, Raymond N.** (2020) Emergency Department Nurse and Doctor Perceptions of Sepsis Management & Factors impacting on patient care. Virtual presentation at the Australasian Society of Infectious Diseases NZ conference.
- **Rogan A, McQuade D,** Larsen P. (2020, August). Biomarkers and their Relationship to Acute Brain Injuries in the Emergency Department. The BRAIN Study: Research Project Proposal. Powerpoint presentation by Dr A Rogan at the ACEM Research Symposium 'Shark Tank' Session, Virtual Conference with Australasian attendees.
- **Chan, C**. (2020) Junior doctor perceptions on Exercise Prescription. ACSEP Conference 2020, Canberra 5-9th February –(Poster presentation).
- **Chan, C. (2020, October 31)** Junior doctor perceptions on exercise prescription. SMNZ North & South Conference. Christchurch. (Conference speaker)

Book Chapters:

- Hsu CK, **Peckler B.** (2019). Ring/Constricting Band Removal. In: Schaider JJ, Barkin RM, Hayden SR, Wolfe RE, Barkin AZ, Shayne, and Rosen P. (Eds.,) Rosen & Barkin's 5-Minute Emergency Medicine Consult. 6th ed. (pp992-993). Philadelphia: Wolters Kluwer.

Conference Presentations and Posters:

- **Peckler, B.** S3 (Sim Ghosts) 2019, 1st Runner up for Research Poster, Singapore.
- Chin, B., **Rogan, A.**, Rudland, J., and Rennie, S. Development of a tool to assess peer tutors feedback skills in a virtual consultation. Presentation by Mr Brendan Chin at the Otago Medical School Student Summership Poster Presentation session, 2019.

Grant Applications:

- **Alice Rogan** was awarded $12,858 from Wellington Medical Research Foundation, Project Grant Funds 2020 to support the BRAIN study.
- **Alice Rogan** was awarded $5000 from the Otago Medical School's Medical Education Research Fund. To support a summer student complete the project: Developing a tool to asses peer tutor feedback skills in a virtual consultation.

Audits and Service Evaluation

- Randle J, **Rogan A, Peckler B.** An audit investigating guideline compliance of patients swabbed for COVID-SARs in Wellington Hospital emergency Department.
- Gatson A, **Rogan A, Peckler B,** Brankin J. service evaluation examining the departmental effects of Cruise Ship Patients with respect to length of stay, referrals and intervention rates.

Involvement in other Multi-Centre Studies via the New Zealand Emergency Medicine Network

- The HEAD study- an observational study of Headache presentations and management in the ED. Lead Investigator Dr Anne-Maree Kelly, University of Melbourne. Local site investigator **Dr Alice Rogan** & **Dr Mai Nguyen**
- The WOWE Workplace Wellbeing Study- a project investigating staff wellbeing and burnout levels in the Emergency Department. Lead Investigator Dr Mike Nicholls, Auckland City Hospital. Local site investigator **Dr Alice Rogan**
- Emergency department data to assess the impact of COVID-19 restrictions. Lead Investigator Associate Professor Peter Jones, Auckland City Hospital. Local site investigator **Dr Alice Rogan.**
- Paediatric fever and paracetamol/ibuprofen use – perspectives and practice patterns among doctors and nurses in New Zealand emergency departments. Lead Investigator Dr Eunicia Tan, Middlemore Hospital, Auckland. Local site investigator **Dr Alice Rogan.**

Featured Researcher – Alice Rogan

Alice Rogan
Senior Registrar, Emergency Department, Wellington Regional Hospital
Emergency Medicine Research Fellow, University of Otago

Tell us something about yourself to begin with?

I am one of the emergency department, senior registrars and have worked in Wellington for the last 4 years. I am currently working part time clinically and part-time as an Emergency Medicine Research Fellow, in the Department of Surgery and Anaesthesia at the University of Otago. I am enrolled as a PhD candidate and have recently finished my first year of research. I am originally from the UK, and completed by medical training at the University of Birmingham. I moved to New Zealand after my foundation training. Initially I intended it to be a working holiday, but I have not yet wanted to leave.

Tell us about your research and your research experience?

The main research project I am working on at the moment for my PhD is the *BRAIN* study – *Biomarkers and their relationship to Acute brain INjuries* in the emergency department. Essentially, we are looking at whether or not we can use biomarkers in the form of blood tests to help rule out acute traumatic intracranial injuries (such as bleeding or swelling of the brain) that are usually identified on CT (computerised tomography) scan, in patients that present to ED following a head injury.

We have been recruiting patients from Wellington and Hutt ED for almost 12 months

and have nearly 200 patients. I presented our protocol during the Australasian College of Emergency Medicine (ACEM) Research Symposium last year and was invited to apply for college endorsement as a multi-centre study. This was successful and we currently have four other EDs in New Zealand that are completing local approval processes to begin recruitment at their sites.

Before starting the *BRAIN* study, I looked at what our current clinical practice was in ED regarding traumatic brain injuries (TBI), or head injuries. I published a couple of papers last year based on the results as they were quite interesting. Firstly, I audited compliance with the NICE CT (National Institute for Health and Care) head guidelines and noted that compliance was 86%. Alcohol related injuries were a big issue and accounted for one in four of all head injured patients who required a CT scan.

Another thing I noticed was that currently we do a lot of CT head scans but do not find that many significant injuries. For every 100 CT scans we do, maybe five to ten will have a significant finding. An even smaller number than that actually need to come into hospital for an intervention or neurosurgery. In EDs at the moment, in Australia and New Zealand, and probably worldwide overcrowding, access block and resource limitations are a huge issue affecting patient safety. There is just too many people in the department and not enough staff, resources of hospital beds to manage the load. There are long wait times for patients and long wait times for CT head scans. Anything that can reduce wait times for patients, reduce the time it takes to identify significant injuries and reduce the amount of unnecessary scans that we are doing, hopefully that will help the flow of the department and more importantly improve patient safety.

In Europe, some centres have started using a biomarker called S100B in their CT head guidelines. They have reported that the rates of CT head scans have reduced by 30% and saved $135NZ per patient. As we have a different health care system and ED system in New Zealand, it is not yet clear if these biomarkers will have the same benefits. The *BRAIN* study is an observational study.

Anybody that is having a CT head scan after a traumatic brain injury is asked if they are happy to consent to take part in the project and have a blood test taken. We have got about 200 patients recruited at the moment. We are aiming for 300 in Wellington. I received a grant from the Wellington Medical Research Foundation last year to fund the biomarker testing for the first 300 recruited patients. Once we get to 300, we are going to test for the biomarker and see what our results are looking like. Hopefully, fingers crossed with those results we can apply for some more funding for the multi-centre study.

If the results look promising, we will design a new clinical pathway for patients that come to ED with head injuries that uses the biomarkers as a rule out test instead of CT head scans in low risk patients. We will then need to test how safe and if it is better and cost effective for patients and ED.

How long does study CT scan normally takes?

The scan itself probably takes about 15 minutes. But if you add in the time it takes to wait to see a doctor, the time for the request form to be done and accepted, the time it takes to get the patient to the CT scanner, and then wait for the CT scan to be reported, the patient is normally in the department for about five hours.

Once the scans been ordered, you wait on average, an hour and 20 minutes to have your scan done. And then there is that time afterwards for the report to be received. So the blood test in comparison takes 18 minutes. So there'll be some time factors to account for such as the time it takes to take the blood test and get it to the lab for

> *"…you've got a good supervisor and a project that you're really passionate about, then it doesn't really matter how long it takes. You will get something out of it regardless"*
>
> Dr Alice Rogan

processing, but in theory it could be two, three hours quicker overall.

In total, from the beginning to the waiting period, how long does it normally take for a CT scan?

For the CT reports, it varies, but they are supposed to be done within an hour according to the NICE head CT guidelines that we currently follow in ED. There is no KPIs (key performance indicators) or performance measure formally for how quick CT scan should be done. But the guidelines recommend if you've got high risk factors, this should be done within an hour and currently only 45% get reported within an hour according to our recent audit.

So, was it because there is a long wait of people already or was it because lack of medical professional? Or both?

I think it is a combination of factors. Looking at ED CT use at the moment, we order about eight CT heads a day, and on busy days it can be up to 14 a day. That is just for emergency CT head scans. We did actually look at all of the CT scans that were performed in the hospital, and how many were requested by ED and how many were requests for CT heads for everything – not just trauma. Interestingly, ED CT head scan requests accounted for 18% of inpatient radiology workload. One in five of the inpatient CT scans that radiology do are ED CT head scans. We are hoping to reduce that. That is everything, not just trauma, but trauma accounts for about a third of those requests. At least two to three scans per day are requested for TBI. If we can reduce that it would make a big difference on flow, wait times and things.

What do you think is the most significant research you have undertaken so far?

It is probably the *BRAIN* study. We have not had the biomarker results back yet, so it is hard to say. But I would say that this study, even if the results aren't positive – it will be the biggest piece of research that I have ever been involved with.

What do you think is innovative about your research? What makes it unique or novel?

As far as I know, I think this is the first study in New Zealand and possibly Australasia that has looked at these blood tests (biomarkers) in this context, i.e TBI in ED. There are some European and American Studies, but I think they have quite different healthcare & ED systems. This will be the first study of its kind in an emergency department in New Zealand. If the blood tests are a safe option to rule out intracranial injuries we may see similar reductions in CT head scan rates and it should save quite a bit of money but also means that patients will have significant injuries diagnosed faster and receive interventions much quicker.

When you say the biomarkers are you looking quite similar to the biomarkers of what the European countries or other countries are looking at?

Yes, I have gotten a grant from the Wellington Medical Research Foundation to look at S100B in particular. They're using that biomarker in Europe. I think they are using it in Scandinavia and France at the moment. In the United States, they have recently had two other biomarkers called GFAP and UCH-L1 approved for use. But as yet, those blood tests have never been used outside of the United States. I was invited to an advisory meeting with Abbott Healthcare that use those biomarkers and they may be potentially donating us some

GFAP-UCH-L1 biomarker panel tests to use for our study. The two from the States and the one from Europe, we are hoping to test all three of those here to see which one might benefit New Zealanders.

What kind of biomarkers are those?

They all are relatively specific to the brain. So GFAT and UCH-L1 are released from different parts of the astrocytes in the brain. They are thought to be very specific to brain injury and only produced by the brain. S100B is a calcium binding and regulatory protein. It is mostly seen in the brain, but it is also found in fatty tissues and bone. One of the problems with that one is if you have injuries other than just a head injury, it can be falsely elevated. If you break a bone, it will also be a positive test, whereas the other two are slightly more specific to the brain. But in isolated head injuries, which is predominantly what we see in ED, S100B has pretty good evidence as a test. Currently, it is the only biomarker with a validated clinical platform and is cheaper to run. Lots of other research is been done on different biomarkers and the use of biomarkers in other settings, so watch this space.

Is that something that you would look in after your current research?

I would definitely like to. I am working as a research fellow at the moment, and I think I am the first ED doctor that is had this opportunity before. Part of my role involves supervising other research students so we have recruited a few students from the University of Otago, one medical student is completing a BMedSci (Hons) year with us and we have four trainee interns conducting research electives with our department. We have just started some research into concussion this year, particularly regarding the use of biomarkers. We are investigating different tests that we could use to help diagnose concussion in ED. Patients with TBI who have a negative CT head can have symptoms of concussion. So looking at how we can better manage concussion in ED is a new focus this year.

I have heard about something about researchers looking into the concussion of Rugby players. Is that different study or the same one?

I think most of the research around concussion comes from sport. Rugby is the big one. At the moment, we use the same tools that are used in sport in ED, but a lot of them haven't really been validated in an ED setting. It is not work that I have done, but I know only 5% of concussions in ED in New Zealand are sports-related. We are looking at all types of concussions. We see a lot of concussion from road traffic accidents, assaults, and ground level falls following trips and things. We do see sport related concussion, but we see concussion from a wide range of other mechanisms as well. One of the things we are looking at is those tools that we use in sport, - can we use them in ED population? And do they work as well?

Is there any specific thing that you are aiming for future goals in terms of research?

Well, I hope to finish my PhD. I'd like to be a clinical researcher. I would like to work as an ED doctor and continue conducting research. I am trying to support projects that other colleagues are doing. I am also trying to set up other projects for other ED colleagues to complete. ED trainees have to complete research method papers or complete a research project as part of their training. It can be really hard to find a project or find someone to help you set things up. I am working with the university and working with some of the other consultants to try set up a range of projects that other people can do that counts towards their training and also builds some research networks in ED. We have recently set up a collaboration with NIWA (National Institute of Water and Atmospheric Research) – the weather agency.

We are hoping to look at whether weather affects ED presentation rates, and particularly who that affects. We are just doing a pilot study at the moment, but we are hoping we will be able to break that into multiple projects. Does cold weather affect respiratory diseases? Does wind affect trauma? – and those sorts of question. We are also doing some sepsis research and trying to develop clinical decision tools for sepsis. I am trying to have a bit of a supervisory role for some other doctors as well to hopefully encourage other clinicians to do research.

I am really excited about the NIWA project. I think we hopefully will be starting that fairly soon. NIWA are going to help us do a lot of the data mapping. They understand the weather, obviously, a bit better than we do so they will help us interpret that and we will provide the clinical information. I am hoping it will lead to lots of exciting research for our ED, for example, I am fairly confident we will find, you know, weather will have some effect. I think one of the questions is, is that effect significant enough that we need to do anything about it? NIWA's ambition is to design a forecasting tool. If the effect is large enough, could they say "New Zealand get ready, because you are going to have x amount of people that, might be coming into ED with x disease".

Whether there will be a significant effect or not, we will see. As I was saying, we are hoping we can get some other colleagues involved in that and get them into research projects so that we have got a stronger research base in ED.

How would you bridge the gap between your research and the other aspects?

I think at this stage, we are in the really early stages of conducting this research. I guess if we find anything substantial, we are going to have to get all the different stakeholders and things involved. That will include people from the community. Hopefully, I will be able to present the work at some conferences and things.

I think the other thing is, it all comes down to money and funding in the end. If we find something substantial, we are going to have to complete an economic analysis to see if it is worth it for patients? Is it cost-effective?

You are ED senior registrar and you are also a university student. How do you manage your time between that?

Well, I am still probably working on that! I was working full time in research last year and prior to that I was working full time in ED. It is my first year doing the two part time. So far, it seems to be going well. The research that I am doing is clinical, so it means the time that I am in the department is quite good for, getting the word out and recruiting patients. I think I am probably still finding the sweet spot between balancing the two roles. It is a good change, it is nicer than just doing shift work all the time.

What advice would you give young clinicians aspiring to pursue research, while also being in the medical field or in between having family, because research is like a lifelong journey?

I would say, just get involved in anything that you can. I think the thing with research is you have to do something that you enjoy, and that you care about, like, a lot of people will say they do not enjoy research, but often you can get dragged into just doing something for someone else. I think you definitely have to pick something that you enjoy. You need to tackle things by picking things up in small chunks. Do not start by designing your own project completely by yourself; go and find someone else that has a project, go and ask how you can help because you can learn skills along the way of how to complete projects and what sort of things you have to consider. Once you have got a little bit of experience doing that, you can start to think about what research of your own you want to do. Just

start small and design something you know that you can complete. Then you can set yourself some more targets. If you enjoy it, you can keep going. Having a good supervisor will make the world of difference. And if you can get support from a university, I think that is a really good way to do it. Because you have access to a lot of academic support. So my supervisors are Associate Professor Peter Larsen at the university and Dr. David McQuade, an ED SMO. They have been fantastic and I would not have been able to do this without them. I think your supervisor is going to make a huge difference to your outcome. So if you've got a bad project and a bad supervisor, it is just not a good recipe, but if you've got a good supervisor and a project that you are really passionate about, then it doesn't really matter how long it takes. You will get something out of it regardless.

-End of Interview-

Endocrinology

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- Coppell K. J., **Hall R. M.,** Downie, M., Fraser, S. K., Garrett, M., Jefferies, C. A., Kenealy, T. W., Milne, R. E., Orr-Walker, B. J., Paul, R. G., Smallman, K., & Snell, H. J**.** (2020). Diabetes and COVID-19-the meeting of two pandemics: what are the concerns? The New Zealand medical journal, 133(1514), 85-87.
- Scholtens, E. L., **Krebs, J. D.,** Corley, B. T., **& Hall, R. M. (2020).** Intermittent fasting 5:2 diet: What is the macronutrient and micronutrient intake and composition? Clinical Nutrition, 39(11), 3354-3360. https://doi.org/10.1016/j.clnu.2020.02.022

Featured Researcher – Emily Walsh

Recipient of Health Research Council Health Delivery Research Career Development Award, 2020 – Emily Walsh, Registered Nurse

- Approved budget: $79 530.00
- Duration: 12 months

Emily Walsh, a nurse. A researcher. A mother. A humble person. My colleague and I had the chance to interview Emily in regards to the research that she is currently doing. She came in on one of those busy mid-days, but made her effort to accommodate and help us. She is a very down-to-earth person. She has received a Health Research Council (HRC) grant under Career Development and helped pushed her forward into another health science venture of her career. So let us have a look at her research and the type of research nurse she is.

Tell us about your research and your research experience? What is it about when did you start?

This research is running two registries. One is called the Rare Endocrine Disorders Registry (RED) and the other one is called the Familial Endocrine Disorders Registry (FERNZ). They are kind of like sister registries that are running concurrently. I got HRC grant, which started in December last year, which was a Career Development Grant. It runs through till December this year. But obviously we'd like it for it to be ongoing, because it is a registry. We want them both to be running nationwide, proven, ideally. We will require more funding.

I have not really done much research of my own personal research. As I have said before, my first area of research nursing was in cardiology research with Scott Harding and Bev. I went to become a nurse educator in cardiology, radiology. Then I had my babies and went to diabetes research. Diabetes and endocrine work together as a service over

Emily Walsh
Registered Nurse for NZ Rare Endocrine Disorder (NZRED) & Familial Endocrine Disorder (FERNZ) Registries

there. It was Dr. Richard Carroll that got me on to applying for the grant last year, which I thought I had had my chance because he's been applying for grants and slowly recruiting for about three years without media. I have been trying to get funding for about three years. Then I was awarded the HRC grant funding

So what is innovative about your research project?

It is innovative because it is new to New Zealand. No one has ever done anything like that before. No one has looked at our statistics for New Zealand with endocrine disorders. It is mostly focusing on acromegaly, Cushing's disease and Addison's disease – the three main diseases that we are starting off with. Then familial disorders, other rare familial, like genetic disorders that are endocrine-based, much of which there is a number and we just do not have that sort of a guideline in New Zealand at all, just based on

international data. We do not really have any New Zealand data. We do not actually know how many people in New Zealand have all of these disorders. It is just all guesswork based on population.

Is this your first research? If there are more than one which do you think is the most significant research accomplishments so far?

Yes, this is my first lot of research. I mean, I have had my name on papers before, but it is small and all under diabetes. This is my baseline research.

So how do you manage your time between being a nurse, a researcher and family time - with your babies?

I do not, really. Like everybody, we always get lots of diary, writing down and as you can see, I must do that. I guess to be honest, at the moment, a lot of my work is trying to get every DHBs on board with this research. We already had 3DHBs organized but doing the same paperwork for locality in Māori consultation for every single DHB is a lot of paperwork and waiting. It is only just now that we are starting into getting into data entry and towards the end of the year will probably be even more chaotic. It is the balance of trying to not be dragged out to do other things within your area as well. Because I am a bit of a go-to-person for other things in the area. So just trying to balance that. And I imagine that is probably going to be even worse.

After the 3DHB, which is the second in line?

Waikato. They have another Principal Investigator. That is really interesting. She has worked quite closely with Richard Carroll who started all that, maybe ages ago. We also have Midcentral – have been signed up for a long time, just for the RED registry, which is the Rare Endocrine Disorder Registry. So the code RED and FERNZ for my acronyms often. A few have come through lately. I have started in December and that was a silly time to start in retrospect, because nothing happens in New Zealand over Christmas and January. There is no meetings and no getting hold of CEOs, or whatever sign offs each DHB is different with what sign offs they need.

What influenced you the most to choose your current field in research?

Well I work in diabetes and endocrine services for eight years. Post-COVID, there is not as much diabetes research around anyway. We were starting to slow down; you can see the writing on the wall that there may be less work available. Richard Carroll showed me the new opportunity in endocrine research. I have always had a little bit of research outside of the diabetis but not a lot. My husband and my son both have type one diabetes. So I feel like I have got enough diabetes in my life, so it is quite good to have endocrine for a change.

What has been the impact of your research to you as a person, as a nurse?

I guess it just makes you realize how every DHB works. At the moment, I had been helping out in endocrine outpatients as well. It was kind of interesting. There is a little overlap of how people deal day-to-day with the illnesses as well as having them sign up as well at the same time.

So how do you think this will contribute to our community?

It will be good, because we will have New Zealand statistics. We will be able to have our own research rather than basing ourselves off everyone else in the world. We do not have any race statistics so I think that is how it'll impact the community.

Are you collaborating with NZ Stats as well? Or you are just doing your data on your own?

No, this is just my data. Ideally, people will be able to log into the database and actually put in their own data, once it is all up and running. Endocrine needs it throughout the country and every one should be able to do that. I have got the year to be able to get all started. These are all very rare disorders. So as you know, is there a specific in the hundreds per DHB? Not in the 1000s per DHB?

So is there a specific endocrine disease you are looking at?

The three main endocrine disorders for the RED registry are acromegaly, Cushing's disease and Addison's disease.

What was it like applying for HRC funded research?

I had a lot of help. I was lucky that I had lots of people that have done lots of research in that area. We are quite research based in that area. I just did it and got other people to help me and I changed it around. I thought I had no chance getting it. I give it a go and thought that would be no chance. I have got a huge fright. But yes, I am very lucky in the area that I work. I have got lots of knowledgeable people that have done tons of research like PhD people and doctors.

How many times did you revise your application?

We probably did it over a couple of months. So probably half a dozen times.

What will you focus on? What gives you a competitive edge in this area?

Well, I do not know if it is a competition. I do not know what they saw and I think maybe it is just a fresh idea? I feel that is one of those Kiwi things as I was just lucky. I do not know if there is anything in particular. I suppose, its novel. No one has done it before. They have applied for HRC funding, but it is not in their Career Development Role. Maybe they saw something on my particular background.

So you are not really competitive in terms of the research, especially in your area?

Oh, no, no, I mean it is a big thing, but there is lots of people involved in this research. I am just helping to run it. I can not be the only one running it, because it is a national thing. There is no way that I could be the only person but I sort of am right now.

What are your future goals in terms of research?

Each participant that signs the consent form has options to actually be involved in other research. We take over the data, and we can do subsets of research, like of ethnicity, or age or how long it takes people to be diagnosed in New Zealand, things like that. Because they all have these very rare disorders, which takes a long time to be diagnosed. There will be many different research projects that we will be able to derive from that. The next thing we will be getting funding for the following years, because otherwise, it will just be a waste of time.

Are you going to do it under HRC as well? Or are you applying for other grants?

Yeah, probably. Any type of funding or the other thing is now that specialty groups might want to fund it as well. It can regulate societies or other societies that have are really focus on endocrine disorders.

Lastly, if you can impart something you have learned in the academia journey, what would you want to share?

Now, I guess just give it a go and do not doubt yourself like I did, at least I gave it a go. Just say yes to every opportunity, you never know what you can get at the end of it.

-End of Interview-

Gastroenterology

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Featured Researcher – Dr. Nigel Stace

Dr. Nigel Stace is delighted to be joined by Dr. Amanda Chen to lead trials of new medicines for liver diseases. Gizelle Lopez, Registered Nurse and Li Feng, Registered Nurse are the group of very skillful CRA's.

One current trial is investigating whether a bile salt derivative reduces inflammation and scar tissues formation (fibrosis) in patients with cirrhosis caused by Non Alcoholic Fatty Liver Disease (NAFLD).

Hepatitis B causes a significant disease and cost burden in NZ. Gastroenteronology colleagues and the Hepatitis Foundation of NZ have helpfully referred Patients. Trials have investigated with special vaccines and other medicines can boost the immune system to control the virus and stop the need for continuous, after life long antiviral medicines.

Dr Nigel Stace
Honorary Gastroenterologist

Geriatrics

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Intensive Care Unit (ICU)

Major highlights for our department are:

1. ICU-ROX in the NEJM. Led by Wellington ICU this international trial evaluated oxygen therapy in ICU patients receiving life support. It established that standard oxygen therapy led to similar outcomes to more conservative oxygen therapy. This study reversed the

findings of previous high impact studies in the Lancet and JAMA. It was recognised by the NEJM editors as one of the 14 most noteworthy NEJM publications of 2020.

2. The PEPTIC study in JAMA. Led by Wellington this almost 27,000 patient trial is the largest clinical trial ever completed in the field of intensive care medicine. It suggested that proton pump inhibitors like omeprazole (one of the world's most commonly used medicines) might increase the risk of death in patients in the ICU. This was one of the top 10 most viewed non-COVID studies on the JAMA website in 2020.
3. The VITAMINs study in JAMA. This study evaluated the role of vitamin C in sepsis. It reversed the findings of prior low quality studies that had suggested benefit. This was also one of the top 10 most viewed non-COVID studies on the JAMA website in 2020.
4. Between them, the PEPTIC study and the VITAMINS study were viewed more than quarter of a million times in 2020.
5. The STARRT AKI trial was published in the NEJM. This study showed that early initiation of dialysis in patients with acute kidney injury did not improve outcomes and increased the risk of long-term dialysis dependence compared with later initiation of dialysis. This trial has changed global practice

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Involvement in other Multi-Centre Studies via the New Zealand Emergency Medicine Network

- ARISE FLUIDS observational study. Local Site Investigator Dr Sapi Mukerji (ED) and **Dr Paul Young** Keijzers G, Macdonald SP, Udy AA, Arendts G, Bailey M, Bellomo R, Blecher GE, Burcham J, Coggins AR, Delaney A, Fatovich DM, Fraser JF, Harley A, Jones P, Kinnear FB, May K, Peake S, Taylor DM, Williams P; The ARISE FLUIDS Observational Study Group. The Australasian

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Featured Researcher ICU – Benjamin Gladwin

Tell me about your research and your research experience? What is it about? And when did you start?

I have just started in the ICU as a Senior Registrar, after moving over from Australia with my family at the end of last year. I have been given a joint clinical and research fellowship position here in the ICU working with Dr Paul Young who is the Joint Clinical Leader of the ICU and deputy director of the MRINZ. My research experience prior to this was mostly integrated with training however prior to medicine I had completed a PhD in Mathematics at the University of Queensland. I had worked in that department as an associate lecturer and as a tutor. My PhD is in an area of interest at that time was in mathematical and probabilistic modelling of molecular dynamics, but I have always been interested in the crossover between mathematics and physiology. Throughout my training, I have always done little bits and pieces here and there, and the last piece, we are writing up is on heart rate variability in critical illness for the determination of brain death, hopefully this will be presented at the next College ASM.

Benjamin Gladwin
Senior Registrar
Clinical and Research Fellow
Wellington Hospital ICU

Here at Wellington we are starting a Multi-centre randomised controlled trial looking at postoperative cardiac surgical patients. The

trial is called MAGIC and will investigate the effect of methylene blue on postoperative vasoplegia. Patients that have cardiothoracic surgery undergo a very significant invasive procedure. In many cases they wind up in ICU for a prolonged period of time, many days. This is in some cases associated with a number of complications. There is a very small trial that was done quite some time ago now, which showed that a single dose of methylene blue, completely reversed the vasoplegia these patients had in a very short space of time, less than 4 hours. If we can confirm this finding the protocolised use of Methylene Blue in this situation may significantly reduce the amount of time patients spend in ICU. This will be the first RCT that I have been responsible for and so it is really good to be learning the process of how to implement this sort of research under the guidance of Dr Young and the research team at Wellington ICU.

What is innovative about your research?

I think the innovative part of this is that there really has not been very much on this before aside from the one small RCT. Our study will have a vanguard phase which will be bigger than the previous study and then will extend beyond that to hopefully answer that will alter the way these patients are managed in the ICU.

Have you done other research besides this?

I have got two projects that are still being analyzed from my last hospital, there was one project where we did observational study really on fatigue management in retrieval medicines. It was motivated by the fact that in aviation, in particular, there are very strict rules, which limit the sorts of things pilots can do if they have not had sufficent sleep prior to their shift. As you are aware, there are no such rules in medicine. The goal was to see if you could compare the sleep patterns of pilots to those of doctors and objectively measure the impact of fatigue in the medical staff. The data from this is still being analysed, but it does look like you can tell from physiological markers such as heart rate variability that a person is tired. This may allow us to look at ways to limit fatigue in medical staff in the long term, but the results are very early.

From your point of view, which do you think is your most significant research accomplishments so far?

I do not know. It is all very exciting. I think the MAGIC trial is going to be the biggest impact thing I have done so far. I think the other two projects are looking at heart rate variability have a lot of room to make a very big difference but they are hypothesis generating research at this early stage.

Does MAGIC stands for anything?

Yes, it is **M**ethylene blue in the **A**ssessment of **G**ain In **C**ardiac surgery.

So how do you manage your time between being a doctor, a researcher and your family time? How do you balance your time?

Poorly. I was just saying the other day that I really want more – more clinical time and more research time and more family time. It turns out, there is a limited number of hours in the day. I think the trick will be trying to confine the hospital work to the hospital, the home life to home and the clinical work to the floor, but it is a work in progress.

How is that going so far?

I think I am doing better than I thought. But I think if you talk to my family, you might get a different answer.

"Do not rush... Your gain are all useful skills."

Dr Benjamin Gladwin

What interests you the most to choose your current field in research?

Look, I have been very interested in intensive care research in general for a very long time. I think there is a lot of things that are done in quite standard ways in research processes, particularly critical care. And we are not getting answers as fast as we'd like. Part of this is the in homogeneity of our study populations, but some of it is in the questions and the approach to the research. One of the reasons that I came over to Wellington was because the research department here are doing things in a different and innovative way. The questions they are investigating are important and they are getting great results. For someone who is interested in incorporating research into his or her future practice, that makes Wellington ICU an excellent opportunity.

What has been the impact of your research to you as a person, as a clinician? Or how do you think this will contribute to our community?

I think I was amazed that there was so little evidence in this area to start with, particularly because if you move around a lot you get to see very large practice variation. Some people swear by the use of methylene blue in this population group, and some people do not. I think I was amazed at how passionate people could be given the lack of solid evidence, so I think if we can get even similar results to the ones that have previously been made, then we could significantly shorten admission times for the cardiac surgical patients and limit their complication rates.

Is not methylene blue use as a dye?

It is. It is normally used as a dye in all sorts of things, but in particular scans for CT scan, urological procedures and similar diagnostic procedures. It does have some very interesting vasoconstrictive properties to do with how it affects the nitric oxide synthase pathways that are in your vasculature. It is a rescue therapy that is used in sepsis and refractory vasoplegia in other circumstances including transplant. In post-operative cardiac surgery, there is significant practice variation even across New Zealand so it would be nice to see if we can contribute to the body of knowledge in this group of patients.

Are you planning to do that as intramuscular or IV?

That will be IV, it'll just be IV, one dose over one hour. In the previous small study, it shortened the time on vasopressor support from 48 hours to 4 hours. Mortality in the treatment group was 0% compared with 20% in the control group. That is quite a significant improvement and it will be great if we can replicate it.

What are your future goals in terms of research?

Oh so many ideas. I think I am very early in my research career, and at this stage, there are only really questions. There is heaps of stuff I'd like to do, I am very excited about by the large amounts of data that are collected in a lot of units as we transition to electronic charts in ICU. It is all recorded in a very big databases and I think there is a lot of information to be gained from interrogating those databases in an organised manner. There are groups across the world looking at this in more and more detail and I think that is a very interesting avenue for the future.

For example, you are given, two topics that you wanted to research in the future. And you have the funding, the money you, the time, and everything you need for that research, what would it be?

I would like to look at using machine learning algorithms to look at the information in those large physiological databases. I think it would be very interesting to use that process to generate questions which would form the basis for prospective randomised controlled trials. That is a big topic, and if I could even

get into that, it is probably the remainder of my research career.

You already have a PhD in Mathematics. So what is your original background? You do have a medical degree?

Yes. So I started off doing a Bachelor of Science. And I did a combination of mathematics and physiology. I complete honours in mathematics and was given a scholarship to assist with a PhD in Mathematics after that. I had been interested in medicine while I was doing my physiology degree and after my PhD, I decided to try the medical qualification exams. Which eventually led me to here.

Sounds like you have quite a bit of a journey. I am just looking into why you are interested into AI, because AI is more of a computer science thing.

Yes. My PhD was in the junction between probability theory and computer science. I had to do some computer science and some programming for that. There is a lot of units recording, a lot of data and it is difficult to analyse that by hand so it seems like there is room to combine with data science and computer science to tackle this problem. It is very exciting and rapidly evolving so I believe there is a lot of opportunity there. Some of these tools are likely to help us learn from what we have done, rather than necessarily having to experiment further.

Whenever I talk to other researchers, normally they would say that too much information can be a downside. But in your case, it looks like it is more of a pro. Why do you think that is the case? Is it because of your background?

I am not sure, it is hard for me to say this because I am very early on, but I think there is a lot of people in research in silos. It is hard to be a good statistician, and a good clinician, and a good computer scientist and a good data analyst. My experience has been that, there is a lot to be gained by joining these silos together and learning from each other. When I was doing my PhD, I had a particular interest in population models. And the epidemiology department was doing a particular experiment for which the math department had a solution already, but they weren't aware of. By connecting these two groups, the problem could move forward very quickly. I think that happens a lot.

So in answer to your question, I can read a little bit of data science, I can program a little bit, I can also do the clinical medicine. I have maybe an opportunity here to help people talk to each other and solve problems in this way.

If you can impart something you have learnt in the academia journey, what would you want to share?

Do not rush. I would like to be finished training now, but I think that all of the things that I have done going down the longer direction taught me a lot of skills that have been not useful for the first five or six years of my clinical time, but are becoming more useful and more valuable. I think if you do something that, you think you are never going to use again, just be careful about that statement. Your gain are all useful skills.

-End of Interview-

Infectious Diseases

Infection Services includes infectious diseases, infection control & antimicrobial stewardship at CCDHB & HVDHB and clinical microbiology WSCL increasingly working together as an integrated regional service.

Infection Services are one of the services most active in research, especially relative to the service's size. We have been well supported by the Research Office, CCDHB and are looking to continue to grow our research capacity and to foster collaborations. Specialists in the Infection Service have a strong clinical base, which could be a useful contribution with university or other collaborators.

Research undertaken includes both participation in (i) larger trials & cohort studies, as well as (ii) applied research on practical clinical topics & infection surveillance.

Clinical trials in which we are involved, and at varying stages from scoping to running, include SNAP (S.aureus), SHIVERS-II & III WELL KIWIS (influenza), E. coli vaccine (Janssen), and ASCOT Adapt (COVID-19). Cohort studies in which we have/are involved include AHOD (HIV), COHESION (COVID-19) and a local ED Registry study (sepsis).

Clinical microbiology projects include assessing the performance of new tests & technology. Recent examples include assessment of new SARS-CoV2 (COVID-19) serological assays, use of whole genome sequencing (WGS) in infection control investigations, surveillance of line & bloodstream infections, and possible applied uses of metagenomics.

Members of the infection service commonly undertake a variety of clinically focused quality improvement research. Recent examples have included a Caesarean section infection bundle, and implementation of guidelines for immunocompromised hosts. Our HIV Clinical Nurse Specialist is currently undertaking a PhD study on opportunities for earlier HIV diagnosis. Our trainee ID & microbiology registrars undertake advanced training projects, e.g. evaluation of the effectiveness of our vancomycin dosing guidelines (with our ID pharmacist).

Over the last year we have fostered several university collaborations. A summer studentship with University Otago Wellington explored chronic venous ulcers (which often lead to infection), and further student electives are being planned. Decision support software to assess and guide management of sepsis with acute infections is being developed in a collaboration with the School of Software engineering at Victoria University School and Emergency Department (ED) colleagues. An ED sepsis qualitative focus group study was completed with nurses & training doctors. We have also started a collaboration with Sydney University regarding validation of variants of modified SOFA sepsis scores.

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- **Blackmore T**. Syphilis diagnoses in Wellington region 2019
- Overill J, **Bloomfield M**, **Blackmore T**. An audit of coded sepsis episodes at Capital and Coast DHB. Summer student project, University of Otago 2019
- An audit of coded sepsis episodes at Capital and Coast DHB. Summer student project, University of Otago 2019 - Overill J, **Bloomfield M**, **Blackmore T**.
- Feasibility of simple algorithm for antibiotic allergy delabelling – Summer student project, University of Otago. with Joy Hu and Juliet Elvy 2018 – to be presented at Choosing Wisely National Forum May 2019

Conference poster presentation:

- “Eating dirt” – an unusual case of toxoplasmic encephalitis – presented at Australasian Society of Infectious Diseases May 2019

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Wellington Blood and Cancer Centre: (Back row, L-R) Michelle Dixon, Brian Ramsay, Dr Robert Weinkove, Dr Travis Perera, Dr Victoria Campion, Catherine Tang (left ccdhb), Kelly Harrison, Melanie Broadbent, Sonam Mishra (left ccdhb), Dr Jared Williams, Anoup George. (Second row, L-R) Dr Tait Bartlett, Alison Smith Kim Barrow RN, Catherine Wood, Lisa Speedy, Cassandra LI, Dr Alwyn D'Souza. (Third row, L-R) Catherine Barrow, Anjela Stewart, Nicole Bowick RN, Kate Milne RN, Maureen Blakemore. (Front row, L- R) Rachael Cahir RN, Debra Morriss, Emma Todd RN, Tati Cocker.

Wellington Blood and Cancer Centre

The WBCC haematology department had a very successful year in clinical research. A major milestone was initiation of New Zealand's first chimeric antigen receptor (CAR) T-cell trial, in conjunction with the Malaghan Institute of Medical Research.

CAR T-cells are a personalised cell and gene therapy, involving redirection of patient immune cells against their cancer. Internationally, CAR T-cell therapies are becoming a standard-of-care for refractory B-cell lymphomas. In late 2019, we opened ENABLE (ClinicalTrials.gov reference NCT04049513), an investigator-initiated phase I trial of a next-generation CAR T-cell therapy. As part of this, the CCDHB haematology service has benefited from a fully-funded clinical fellow, who has supported trial and non-trial clinical work, and IDF funding from referring DHBs.

Publication highlights include manuscripts in the New England Journal of Medicine (CLL14 trial), Lancet Haematology (KEYNOTE-183 myeloma trial) and the British Journal of Haematology (REDDS transfusion trial). The year saw our service recruit particularly well to investigator-initiated trials in chronic myeloid leukaemia and in infection prevention.

2021 will see haematology building on its CAR T-cell treatment experience, NZ investigator-initiated trials to address key questions on haemato-oncology treatment, and commercial trials that bring access to therapies not otherwise available to New Zealanders.

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Haematology

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Featured Researcher WBCC – Philip George

On a Monday afternoon, we were given the chance to have a talk with Dr. Philip George. He works as a Clinical Research Fellow and a Haematology Registrar. He is also employed by Malaghan Institute of Medical Research wherein he primarily works on CAR-T cell therapy research – Phase I enabled trial.

Philip started his role in February 2018 while also working for Malaghan and together they were preparing for phase one CAR-T cell trial for patients with non-Hodgkin lymphoma. This is a novel CAR-T cell product, also called a third generation CAR-T cell, which has not been tested previously. They have collaborated with groups in China in the early phase of the trial and Phil has mainly work from a regulatory standpoint. This involved the HDEC applications, writing up the study protocol, and investigating brochure, relevant documents to Environmental Protection Agency and Good Manufacturing Practice at Malaghan Institute. The trial opened for recruitment in October 2019, and since then his roles slowly merge to the more clinical side of it. He is responsible for enrolling participants, which takes time through screening process, follow-ups and carrying out study procedures, while dealing with the trial management committee and handling referrals for the trial.

Philip George
Clinical Research Fellow
Haematology Registrar

So what is CAR T-cell?

CAR-T stands for Chimeric Antigen Receptor T-cells. CAR-T cell has been very successful treatment worldwide and the second-generation products are now licenced in the US, Europe and Australia to treat B-cell lymphomas. This research is the first CAR-T cell trial in New Zealand and it will utilise novel third generation CAR T-cell construct which has not been tested specifically in other languages. It does have similarities to the

licenced CAR T-cell products but a few differences that make it the third-third generation. This will be the first in-human trials as well.

Aside from being busy from his CAR T-cell research, Dr Phil had been a sub-investigator in a medical research for other studies in the haematology department as part of his role as a Haematology Registrar, but does not have any formal research experience prior to this.

So while you were being involved into other research and your own, which do you think is the most significant research accomplishment/s you've had so far?

I think the first thing would be setting up, getting the trial to the point where it could open to recruitment because a lot of background work is to set up the trial and all of working with, multidisciplinary team of people to do that. It is a group effort, but getting to that stage where you put all of the different applications together and we'd got to the position where we could set up the trial

I did a Master's in Clinical Research (from Victoria University, Wellington) as well, which I got in August. I got Distinction in that so that is an achievement as well. It was a Master's by thesis and the topic was third generation active CD19 – related to the CAR T-cell therapy. As a thesis by publications were used as part of the workup for the trial with Dr. Weinkove, my supervisor I have been involved in a few publications, and they use that to contribute towards the thesis as well as adding chapters to it as well.

Aside from being a doctor, a researcher, Phil and his partner just welcomed their adorable little twins, which definitely keeps his time super hectic. I am pretty sure, readers will be curious as to how he handles being a new father and his work.

How do you balance your time?

Well, that is a really tough one. I am still learning all that stuff. I do not know if I am doing it right or not, but I do not know a lot. I guess I am not doing any full time clinical work aside from being employed full time by the Malaghan Institute. I do a day a week as a haematology registrar, doing clinic and that keeps my hand in clinical side. The rest of my time is really more devoted around the CAR T-cell trial and research activities.

Have you faced any challenges in regards to your research and just a clinician in general?

I would say so. I think there are times when setting up the trial was a challenge. We had some delays, and we had to go through things a few times to get to the right places. It took a lot of perseverance. Now, one of the challenges is that we have had a lot of referrals and we are trying to prioritise referrals we get because we have only treated a relatively small number of patients on a phase one trial. We are limited by the manufacturing capacity that we have as it takes a number of weeks to manufacture CAR T cell products. We treat one patient at a time. We have to have a trial management committee, we have to prioritise what patients, and we can line up for treatment. Sometimes we have multiple referrals coming in. So that is a challenge and I am working through that.

"Be smart about your output... rather than repeating everything again, try and use things for multiple purposes to achieve a goal."

According to NZ Cancer Registry 2017 (most recent), the number of new known cases that year in NZ alone is 11509 which is a huge increased from the first time it was recorded back in 1948 (1436). Taking same registry and

year, there is about 914 known cases for non-Hodgkin lymphoma[1]. We managed to ask Dr Phil about the impact of his research to our community, to himself, and if there are other future research he would want to divulge himself especially relating to cancer therapy.

What has been the impact of your research to you as a person and as a clinician?

I think it is really improved my writing skills, so I am able to write more succinctly and clearly and more focused. I think it is improved my time management skills, because you have to manage more your own deadlines a bit and decide how you plan your workload, which is good. I think it is improved my ability to work with multiple different groups of people – not just clinicians, but other groups such as scientists, technicians in New Zealand Blood Service, clinical nurses – a whole variety of different people working together, which has been good.

How do you think your research will contribute to our community, especially to the haematology community?

Hopefully this trial will be a platform to either larger trials in the future relating to CAR T-cell therapy. Also the option of potentially in the future of commercial CAR T-cell therapy, so we can learn from what we are doing in this trial to expand to future trials – maybe other indications (other cancer types). So it can lay a groundwork to building on this for the future. It is a new modality of therapy.

From my understanding, CAR T-cell is very specific in terms of cancer type?

Yeah, that is right. The vast majority of the success has been in β-cell cancer and it is targeted against CD19. There has not been anywhere near as much success in solid organ cancers. So currently, it is more than haematological cancers. There is increasing success in myeloma, for instance, that could be another target in the future that could be treated in Wellington as well. So other cancers and then bigger scale trials may be like a phase two trial where you can treat more patients, potentially, across New Zealand that will be a target for the future.

What are your future goals in terms of research?

I'd like to be able to, autonomously run it longer term. In the long term future become a principal investigator of the study. I'd like to be able to use the skills I have got from this job to take that forward to other studies in the future. So I can use the skills I have developed from, working on protocols and databases and have an input in future studies as well. That would be good.

What influenced you the most to choose your current field in research?

I started haematology training in 2014, as a registrar, and I was very interested in improving cancer therapy. I am also interested in the immune system and novel ways of targeting cancer. It is a very multi-disciplinary approach. You have evolved in the Blood Service, laboratory scientists and clinicians. So there is a lot of people coming together to input this therapy, which is quite often.

So what attracted you to do the CAR T cell? Just come up with that, or just read it from somewhere or someone pitch it up to you.

I'd read and I knew that it was an exciting new area for therapy and that being developed in research and I was coming from the UK. I was looking to do, ideally some research in New Zealand. I heard about Dr. Weinkove's research and approached him about it. I think fortuitously, it was at the time where he was developing a phase one trial. I was able to go into that role as a haematology registrar looking to do intelligent research, and they've

[1] https://www.health.govt.nz/publication/cancer-historical-summary-1948-2017

worked nicely to be able to go into that role. Perfect timing. Good timing. Right time, the right place.

If you can impart something you have learned in your academia journey, what would you want to share?

So one thing, which I think has been helpful and what COVID has taught me, I guess, is being smart about your output. If you are working on one, big project, use that to gain another output as well. If you are working on a publication, review article, use that as part of something else. For me I worked a lot on a review article with Dr. Weinkove and then we use the relevant parts of that to improve our masters. So rather than repeating everything, again, try and use things for multiple purposes to achieve a goal.

So two birds with one stone?

Yeah, I think so – be smart about your output. I think also being succinct and targeted with your communication and writing things. I do tend to write too much or be golf for point but it is good to stay on point and stay focus, otherwise you lose people's interest.

-End of Interview-

Medical Oncology

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Physics

The main research activity from medical physics during 2019 and 2020 is that Nick Lowther (PhD student) completed a PhD in 2020 titled 'Optimisation of the treatment quality in head and neck radiation oncology'. Nick was based at WBCC for the 3.5 years duration of this research work, and he was jointly supervised by WBCC principal physicist Dr Rob Louwe and Dr Steve Marsh at the University of Canterbury. Nick is now working in the Blood and Cancer Centre as a medical physics registrar.

This research work resulted in 3 publications in international journals during 2019 and 2020 as follows:

- N.J. Lowther, D.A. Hamilton, H. Kim, J.M. Evans, S.H. Marsh, R.J.W. Louwe, 'Monitoring anatomical changes of individual patients using statistical process control during head-and-neck radiotherapy', Physics and Imaging in Radiation Oncology, 9, 2019, 21-27.
- N.J. Lowther, S.H. Marsh and R.J.W. Louwe, 'Quantifying the dose accumulation uncertainty after deformable image registration in head-and-neck radiotherapy', Radiother Oncol, 143, 117-125, 2020.
- N.J. Lowther, S.H. Marsh and R.J.W. Louwe, 'Dose accumulation to assess the validity of treatment plans with reduced margins in radiotherapy of head and neck cancer', Physics and Imaging in Radiation Oncology, 14, 2020, 53-60.

Lynne Greig
Chief Medical Physicist
Blood and Cancer Centre

Radiation Oncology

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Mental Health, Addictions and Intellectual Disability Service

Adult Community and Addictions Service

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Younger Persons Community and Addictions Service

Child Adolescent Mental Health Services

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Forensic and Inpatient Rehabilitation Service

National Youth Secure Service

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- Dr **Enys Delmage:**
    - Presented at a UK Conference via Zoom on the minimum age of criminal responsibility
    - Presenting at the Werry Workforce Youth Forensic Forum on conduct disorder.
    - Co-written an online RCPsych module regarding court reports for children

Te Korowai Whariki Central Regional Forensic and Rehabilitation Service

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- Dr **Jacqueline Short** has published:
  - **Short, J.,** Cram, F., Roguski, M., Smith, R. and Koziol-McLain, J. (2019), Thinking differently: Re-framing family violence responsiveness in the mental health and addictions health care context. Int J Mental Health Nurs, 28: 1209-1219. https://doi.org/10.1111/inm.12641

- Webinar for the Royal Australian & New Zealand College of Psychiatrists on Thinking differently: reframing family violence responsiveness in mental health and addictions context (7 August 2020)

- **Short, J.** as a joint authorship in a chaper. ISBN 978-1-61537-370-3
  - 'The impact of mental illness on parenting': Joint presentation of **Short, J.** with Nigel Fairley, GM, MHAIDS, to:
    - NZLS CLE Family Law Conference Nov 2019 (Conference proceedings and papers published)
    - Wellington Family Courts' Association February 2020
  - Trauma in Forensic Contexts – Invited speaker: RANZCP Victorian Faculty of Forensic Psychiatry 18/8/19, Melbourne.

Chaplaincy

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- **Rev Canon Kath Maclean –** Co-wrote the "Sustaining our wellbeing" journal article for CCDHB in 2020.

Nursing

Rigorous research informs our professions body of knowledge and helps to advance nursing practice. It is important we recognise nurses' contribution to this knowledge development says Chris Kerr, Chief Nursing Officer 2DHB.

Nurses in research roles are integral to many of the research teams as evidenced throughout this report. Emily Walsh's emerging research profile highlights available opportunities for nurses to contribute and to lead research projects. Our academic research contributors include Jessica Buckley who has completed her influenza pandemic research. This project was finished coincidentally as Covid-19 became a reality and has informed the emergency department nurses' role as front line workers in a pandemic. Zoe Perkin's research also explored nurses' experiences with a focus on how nurse managers navigate between professional practice and generic management leadership demands in clinical services. As a theatre nurse Sam Pineda Master's research critically examined how staff use the surgical checklist and will inform practice improvements.

Christine Kerr
Chief Nursing Officer 2DHB

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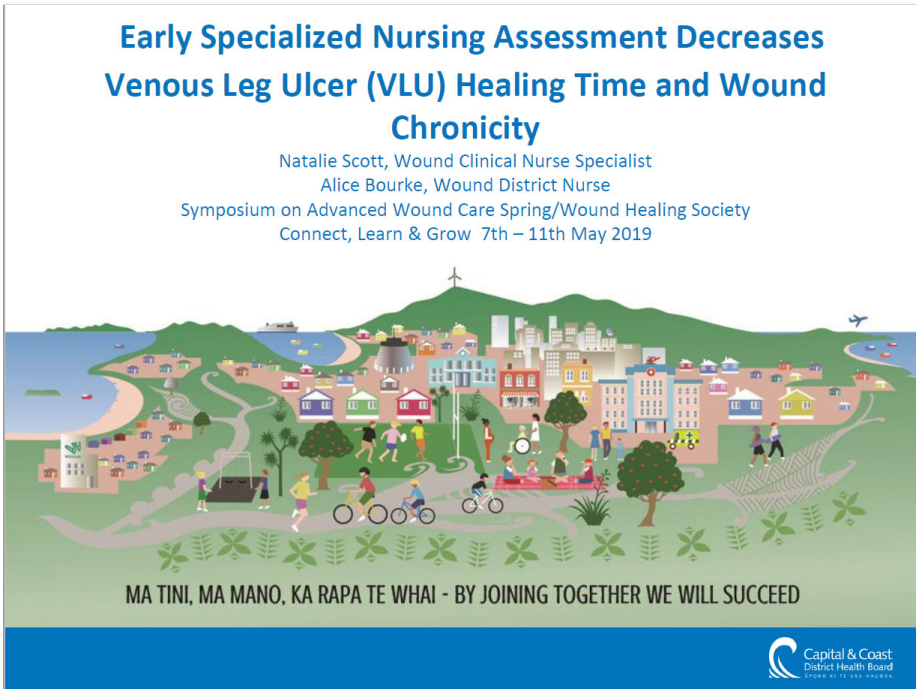
Community Wound and Care



Top-Scoring Nurse Research Abstracts Symposium on Advanced Wound Care (SAWC) Spring 2019

Our district nursing service faces a burgeoning aging population with increasing numbers of complex venous leg ulcer (VLU) referrals. Our response to this growing wound problem has been to implement a new specialized, early assessment and intervention model. Previous service audits identified recurrent VLUs take longer to heal than first presentations. Previous VLU healing times averaged 33 weeks.

A clinical audit research project was undertaken (2017-2018) that aimed to determine healing rates and establish whether early intervention and compression bandaging in the first 6 weeks of

ulceration could reduce chronicity. A secondary aim was to identify healing rates for new VLUs over recurring VLUs.

The clinical, eitiology, anatomy, pathophysiology (CEAP) venous classification tool was used to enable early identification of potential slow healing. Doppler ankle-brachial pressure indices (ABPIs) were measured and compression bandaging commenced accordingly. Healing expectations were set at 25%cm2 wound area reduction within the first 4 weeks. This was monitored using accurate reliable camera imaging devices with confidential patient records system capability

A retrospective observational study was implemented. Lower limb ulcerations were identified by statistical coding (excluding arterial and cancerous wounds). Time to heal and time until the patient received a Doppler assessment were analyzed using descriptive statistics and their relationship using nonparametric Spearman's rho test. Continuous variables analysis was measured by means of variance (ANOVA) and independent Students t test. A statistical software package provided statistical analysis.

Out of 247 VLUs, 219 (88%) healed within 28 weeks with an average healing time of 9.70 ± 7.12 weeks, 82% healed by 24 weeks, 49% received compression in first 6 weeks,

68.4% received compression during their 24+ weeks VLU duration. "Other" ethnicities showed significant statistical difference in age of VLU onset.

Investing in increased access to specialized wound nurses enabled improved VLU healing outcomes and reduced chronicity.

Natalie Scott
Wound Care CNS
Community Health Service
CCDHB

Strategy, Innovation and Performance

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Women's and Children's Health, and Surgery

Child Health

Professor Dawn Elder
Chair
Child Health Services Research Committee

I am pleased to provide this introduction to the Child Health Services Research report. The service encompasses a range of subspecialty services including General Paediatrics, Neonatal Medicine, Paeadiatric Surgery, Paediatric Neurology, Paediatric Endocrinology, Paediatric Sleep Medicine, Paediatric Oncology, Paediatric Infectious Disease, Child Protection, Developmental Paediatrics and Genetics. Research and audit is undertaken in all these areas by both Clinical Staff and Joint-Clinical academics employed by the University of Otago, Wellington. Both local studies and multi-centre studies are undertaken. Research is also undertaken by researchers outside of the service who take the opportunity to recruit from DHB children and youth and their whānau for studies related to child health issues. The service also supports Trainees in Paediatrics undertaking projects and postgraduate Masters or PhD research. The Child Health Service Research Committee meets monthly to review research and audit applications for locality approval. I would like to thank my colleagues Marina Dzhelali and Debbie Rickard for their ongoing work as members of this committee. I hope you enjoy reading about the research outputs from the Child Health Service.

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Ongoing Research

- RSV vaccine in pregnancy- multinational study completed 2019
- Does treatment of RSV bronchiolitis prevent later asthma (Approved by Ethics) on hold
- New Influenza vaccine in pre-schoolers- Ongoing 2019
- New oral anti RSVpreparation: proceeding through ethics- approved starting Winter 2019
- TW Presentations
- Annie Yau, Ryan Cha, Sridharan Jayaratnam, Toni Wilson, Askar Kukkady, Stephen M Evans, Jonathan Wells. The Declining Incidence of Pyloric Stenosis in New Zealand. Paper presented at PAPS 2019 Christchurch- also accepted for publication ANZJS.

Featured Researchers – Ngaire Keenan

Dr. Ngaire Keenan
Paediatric Neurology Advanced Trainee

Dr Ngaire Keenan is a Paediatric Neurology Advanced Trainee with a specialist interest in Epilepsy research. Ngaire first began working for the Clinical Trials Unit in 2018 as a co-investigator for the Believe Trial. This open-label trial investigated the safety and efficacy of pharmaceutical grade cannabidiol gel in children with a developmental and epileptic encephalopathy. Following on from this Study, Ngaire has continued to pursue her research interests. She is currently working on her PhD looking at *"Epilepsy in Māori Children"* and was awarded the HRC Clinical Research Training Fellowship for this work. This PhD will be the first study addressing the proposed health inequalities in Māori children with epilepsy and will be a strong base for her career as an academic physician.

-End of Statement-

Meghan Sandle

Can you please tell us about your research and your research experience?

My current research is in the neurodevelopmental follow up of high risk infants which is through University of Otago as a Master's degree with postgraduate research university scholarship. This study is looking at early cerebral oxygenation, particularly cerebral hypoxia, in extremely low birth weight infants born in Wellington neonatal unit. We are following them up to two-years looking at their neurodevelopmental outcomes so we can see the effect of low oxygen levels to the brain in the first few days of life on later neurodevelopment.

I have also been involved in some other research studies from the neonatal unit by helping to coordinate and performing

Dr. Meghan Sandle
Paediatric Advanced Trainee
Community Child Health Fellow

"The most important thing is collaborative work, you're never going to have the skill set to be able to do everything, but being humble, talking to people and asking for advice is part of the research process" - Dr Meghan Sandle

neurodevelopmental follow up. Wellington NICU actively participates in neonatal research but part of this is having long term developmental follow up. For any intervention that you do in the neonatal period or new treatment or observations, we need to understand what that means in terms of long term outcomes so the neurodevelopmental follow up process is really important.

The other research that I am involved in here at the Clinical Trials Unit, a study looking at the use of topical cannabidiol gel to help children and young people with Fragile X syndrome.

When did you start your research?

I started my master's research in 2019 and I am doing this part-time alongside clinical work and also being a mum.

We will be finished doing our 2 year follow up in August this year.

Which do you think is the most significant research accomplishments so far?

I think, the work I am doing at the moment for my masters. In this study, we are also using an assessment called the General Movements assessment for infants at 3-5 months of age, which was not previously used routinely in Wellington. It is a really useful assessment because it is an early indicator of which infants are at higher risk of developing neurodisability. So you can identify those infants early and provide extra support and intervention for them. By using the general movement assessment for our cerebral oxygenation research, we have at the same time, set the service up in Wellington for routine use in high risk infants. We published a paper in the New Zealand Journal of Medicine last year outlining how we implemented this, using it for both routine care and research.

This work is also quite novel. We have looked at a high risk cohort of infants and have this detailed information about cerebral oxygenation and are able to follow them up for 2 years. This work is one of the first exploratory studies looking at early cerebral oxygenation in extremely preterm infants and the effects on early marker of neurodevelopment using general movement assessment. We are presenting our findings as a poster[2] next week at PSANZ (Perinatal Society of Australia and New Zealand) and an oral presentation at RACP (Royal Australasian College of Physician) Congress in May.

How do you manage your time between being a doctor, a researcher and a mother?

Yeah, so managing time, I think that is really hard. I think just having boundaries about when you are doing things, because research never ends, and clinical work never ends. And I have been very lucky to have lots of support from my colleagues, who have been involved in this research and my supervisors.

How do you balance your time?

That I think choosing things that are important to you as well. I think I am at that early stage of my career where you want to be able to establish a bit of a name for yourself and have an interest in everything. I think choosing things that actually, that you are interested in, and that you think will make

[2] Early cerebral hypoxia and the general movement patterns of extremely low birth weight infants (poster at the end of interview)

difference and good quality research is a good tip, rather than saying yes to everything.

Have you face any challenges?

As you can see, this little baby often comes with me. So the Fragile X study, which is looking at the effects of cannabidiol gel on the social communication for children and young people with fragile X syndrome, and is really exciting because it is a multicentre international clinical trial and we are the New Zealand site for that. I have been working as sub-investigator for that study.

And I really enjoy it because I love getting to know the families involved in that study who we see regularly and often have to travel from outside Wellington, but balancing these visit, with childcare and clinical work has been a bit of a challenge. But it is been totally worth it! It is an amazing experience to be involved in clinical trial, you really get a feel of how much work goes into a drug trial.

And it is an area where there is not that much clinical research. Families with children with developmental disability can face lots of challenges, so if there is anything that can be done to make things easier, and drugs that are effective, it is very worthwhile work.

What influenced you the most to choose your current field in research?

Good question. I think working in a child development service, it is really useful to develop a good understanding of early infant development, and the factors that influence development, especially for infants at higher risk such as infants born preterm or low birth weight.

What has been the impact of your research to you as a person, as a clinician/paediatrician?

Yeah. The biggest impact has been from meeting amazing children, young people and their families. For the Fragile X study, I am meeting the families regularly and use the different questionnaires that are being using as endpoints and it is a privilege being invited into the family's life which has definitely had a big impact on me. It is very humbling! And also just to see how much families do to help us with research.

And I have tried to give back a little bit by enrolling my own children into some studies. So Carlos, was in a study done here in the Wellington neonatal unit as a control term baby. He had to have some blood tests and an MRI and it was actually really good experience, being on the other side of it. And he's also in the Well Kiwi study, which is really important study looking providing information to help develop more effective flu vaccine.

What are your future goals in terms of research?

At the moment, finishing my masters. But I would love to be involved in helping develop a really robust system of how we organise and implement neurodevelopmental follow up for research and to bridge some of those gaps between neonatal care, child development services and education.

I'd also like to continue to use the general movement assessment in research for high risk infants. It is really interesting to look at babies who maybe have had other difficulties or exposures and see how these affects their early movements and the risk of later neuro-disability.

If you can impart something you have learnt in the academia journey, what would you want to share?

I think the most important thing is collaborative work, you are never going to have the skill set to be able to do everything, but being humble, talking to people and asking for advice is part of the research process especially as an early career researcher when you still developing your skills.

-End of Interview-

Early cerebral hypoxia and the general movement patterns of extremely low birth weight infants

Sandle M[1 2], Saito-Benz M[1 2], Bennington K[1], DeVries NKS[2 3], Berry M[1 2]

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Background

Infants born at extremely low birth weight (ELBW) have a high burden of neuro-disability.[1] Early prolonged cerebral hypoxia has been implicated in the development of preterm neurological injury and later poor neurodevelopmental outcomes.[2] Near infra-red spectroscopy (NIRS) offers non-invasive monitoring to identify infants most at risk and provide potential target for intervention, however, is not yet part of routine clinical monitoring. Furthermore, the duration of cerebral hypoxia that leads to neurological injury is not well defined, and the cumulative effect of brief cerebral hypoxia on adverse neurodevelopmental outcomes is unclear.

Aim

This study aimed to explore associations between early cerebral oxygen kinetic and neurological outcome. We hypothesized that early cerebral hypoxia would be associated with increased risk of later neuro-disability in ELBW infants.

Methods

Infants born < 30 weeks gestation and < 1000 grams birth weight at Wellington Neonatal Unit were prospectively recruited. Cerebral regional oxygenation ($crSO_2$) was measured using Near Infrared Spectroscopy (INVOS 5100c, Medtronic) continuously for 72 hours after birth. In the current study $crSO_2$ < 63% (2 standard deviations below the mean for gestational age using INVOS neonatal sensors[3]) was considered significant cerebral regional hypoxia.

Neurodevelopmental outcome was measured using the General Movements Assessment (GMA) and motor optimality score between 3-5 months corrected postnatal age.

NIRS set up at the cot-side

General Movements Assessment

The general movements assessment (GMA) is a standardised tool which analyses infant motor patterns. GMA is an early marker for neurodevelopmental impairment and the absence of normal fidgety movements (FM) is highly sensitive for development of cerebral palsy. The Motor Optimality Score (MOS) provides additional information, and suboptimal scores (<25) have been associated with a range of poor neurodevelopmental outcomes.[4]

Results

GMA outcome data was available for 34 infants with mean gestational age of 25^{+6} weeks (range: 23^{+0} – 29^{+5}) and birth weight of 735 grams (range: 505 – 998). 32 infants had additional motor optimality assessment done.

Overall, mean $crSO_2$ (±SD) was 76 (±6)%. In 29 infants with normal GMA (FM present) the mean $crSO_2$ was 76 (±5)%, whereas mean $crSO_2$ was 70 (±10)% in 5 infants with abnormal GMA (absent FM) (p=0.06).

Cerebral hypoxia for > 1 cumulative hour was associated with suboptimal motor scores (MOS <25) (p=0.04) (Figure 1).

There was a negative linear correlation between motor optimality score and total duration of cerebral hypoxia (r^2=0.136, p=0.04) (Figure 2).

Figure 1: Number of infants with time spent with cerebral hypoxia as per optimal and suboptimal motor score

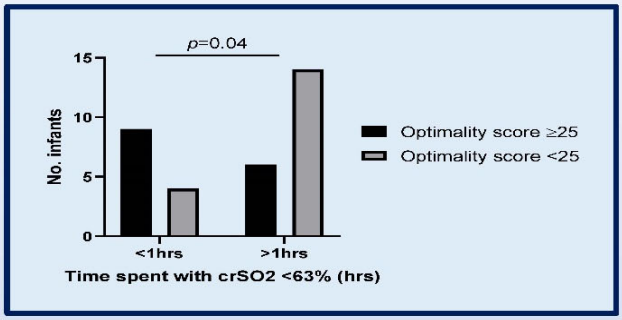
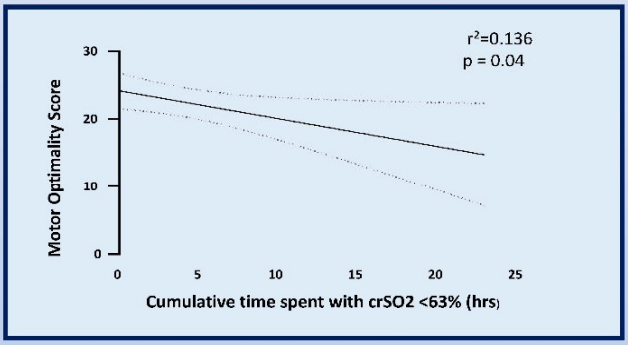


Figure 2: Relationship between motor optimality score and total time with cerebral hypoxia



Conclusion

This is the first exploratory study comparing cerebral oxygenation in first 72hrs of life with GMA in ELBW infants. We observed trend towards lower cerebral oxygenation in infants with absent FM. Furthermore, there was a significant association between suboptimal general movement scores and cerebral hypoxia for more than 1 hour suggesting that even brief episodes of cerebral hypoxia are associated with an increased risk of neurological dysfunction. The role of cerebral oxygenation monitoring as an early predictor of neuro-disability therefore warrants further investigation.

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MARIA SAITO AND MEGHAN SANDLE'S STUDY

Thorsten Stanley

Dr Thorsten Stanley
Consultant Neonatal and Paediatrics

What research skills have you acquired during your academic career?

That would be cooperative research, first of all, the importance of teamwork, the importance of selecting correct experiences, the importance of continuity, in other words; also including the team people who are in the process of learning, because the learners we will have today will be the leaders of tomorrow. If you do not expose them early on, they will never actually achieve that. The importance of failure and being able to bounce back from failure. The importance of rejection and being able to bounce back from rejection. The importance of time keeping, the importance of accuracy, the importance of fastidiousness in every small little thing.

The importance of lateral thinking, the importance of imagination. The importance of guidance from where we were before, at the early stages of research projects – it is a little bit like when the Te Papa was built, the new museum over there. I could see and hear them building from my old room where I sat in my own paediatric department. The preparations went on for months and months, in fact, years of *banging, banging, banging, banging*. You could see nothing, there was nothing visible at all, they were down some hole in the ground, and preparing the actual foundations. For *years*! When the actual building came up, it came up quite quickly in about a year, but it had been three years preparing the foundations.

Good research is the same. It is all about preparing the foundations, they take an enormous length of time, by the time the actual research project starts, if the foundations have been done properly, it is easy-peasy. It will all be done in a short period of time, because you prepared everything beforehand. But there is a real temptation to want to get in there and collect data or in putting in the pregnancy intervention and so on, hoping that you'll get a quick recovery, but the extra thing is the importance of long term planning. For me research that has only got a short-term outcome is very great waste of effort. Because even if we show results in the short term, the long-term outcomes may be completely different. If we fail to follow our patients' long term, or our studies long term, when our patients are going to survive into late adulthood or later childhood, we miss an enormous amount of wisdom, we get a little bit of knowledge, but we do not get wisdom. And very often, its long-term results that people really want to know. When you ask me about a research project, you really want to ask yourself, what are the actual outcomes that are most interesting? And I have very commonly seen research done where statisticians nod their heads enthusiastically and say, we have a highly significant result here. This is very different from the control group. Then I say, what's the *clinical*

significance of that difference? What do you mean? Does it make any difference to the outcome or care or treatment? Or is it just a measurable difference? Surprisingly, very commonly, the answer is, there is no difference in outcome; the actual number of patients... you'll need to treat 1000 to get one patient getting benefit and all that research was for nothing, because the clinicians will say, 'so what???' and that is part of planning: making sure that the outcome you want is something with some value and an interest. Otherwise, it'll end up in a journal somewhere, and nobody has ever looked at it; and it is been my impression very often how research that at the time, I have thought. 'Well, this was moderately interesting'. But when you come back to it later, everyone's still looking at and quoting that research and other research that you thought was really exciting in the short term has been forgotten.

There may be a reason behind that they're researching something on the same topic.

I mean, there is lots of reasons why. But one of the reasons is you are actually asking the wrong questions and the important questions that would have been better ones have been forgotten. That is why you must have clinicians involved in clinical research, not just scientists!

What is innovative about your research?

Okay, well, as a person, as a researcher, I am really bad at the ticking boxes and doing the minutiae. I am also not very good at mathematics, stuff that doesn't really turn me on, crunching it all through a machine or a computer or a program or something to see what the mathematical outcomes were there, I like to leave those things to other people that get really excited by those sorts of things. In my early research career, I found it hard because I didn't want to do that. The other thing I do not really enjoy very much, is writing up the results. To me, that is not very interesting either. For me, the interesting part is the planning and the interpretation of the implications of the results. And what I bring to research is imagination and lateral thinking is something that I do pretty well. Today, I really will give you an example here for you from today: I had an idea or two ideas, actually, we have been very interested in the relationship between the natural Earth and allergies and asthma, and whether in fact, something about the way we live, is increasing the prevalence of these diseases.

There is been some work from my colleagues, especially out of Massey University, where they have demonstrated the people who live in environments where there is a richness of plant life have much lower rates of allergies and asthma than people who live in concrete jungles, or places where there is only one species like radiata pine. And today in *Nature*, there is a publication showing that in Africa, and in Europe, small farms, run by families, not only encouraged much more complexity of species types than large farms. In other words, large farms kill off all the other plants apart from the one they want to grow. Very small farms, they live in much more cooperation with the plants and animals, and they have a much wider breadth of species growing.

What the paper in today's *Nature* published showed was not only do they have a much healthier environment, but they actually are just as efficient. In fact, they're *more efficient* at producing food than the big farms. There is a huge area for New Zealand to think about. We are going more and more towards big farms, with killing off more and more species, farmers spraying the fields with things so that only one thing grows. That probably is going to make us sicker.

So that was the thinking I had this morning with my colleagues, have a look at this article. Because we are all doing research at the moment into species diversity and an expert analysis. This is an interesting article looking at how you could increase diversity of species

and saying, maybe politically incorrect. New Zealand should be looking at encouraging *small* farms rather than the big farms changing politics. Also carbon neutrality is better with small farms – I guarantee it is – than the big farms. Certainly pollution is much less with small farms than it is with big farms. The big farmers do not pay for the pollution they create as they can run away when the crops stop producing as they have depleted the soil of all the healthy life; the small farms have to live with it.

Then it made me think, along with the movement from small farms to big farms, and from hand farming to machinery farming has come a shift of population away from rural areas into cities with their associated lack of housing, because everyone's moving to cities and China has experienced that to a huge extent. But what that also leads to is a draining of populations in the rural communities. So there is far less *diversity* in the *human* population in the rural centres and maybe that is also bad for us, maybe we should also have a very diverse human population. We just hear about, for example, in rural places, there is no meeting place.

There is no bank, there is no library, and everything's shut down. And the people living out there are living a very, very unpleasant lifestyle. So that was my thought today, this is a new thought, extending the idea of diversity, from plant diversity to human diversity. That is me thinking laterally. That is two new ideas I have had today. I can bring those ideas to research. Other people can bring the mathematics, other people bring the typing in, the spelling and etc., but I bring those things.

What has been your role so far in developing research ideas and carrying them forward?

I think it is really more of the same as what I have just told you, because when I am involved in teams, I have been invited to join research teams, because people say, *'Oh, he's coming, is he going to bring something new along?'* So that is what I bring. I bring innovation. And I bring lateral thinking.

What do you think is your most significant research accomplishments?

I think the area I work with Kristen Wickens and Julian Crane in the area of probiotics and prebiotics. There are some excellent probiotics and their relationship to allergy and human health has probably been my biggest contribution to research. But I have a broad research interest; not trying not to be too narrow, just like my paediatric clinical career has been extremely broad. I am the only paediatrician in Wellington that covered both neonates and the children's wards from the time I first arrived. So I have covered the whole spread of paediatric experience, the others all said, *'I only want to do babies'* or *'I only want to do not-babies'*.

What are your most important publications?

I think the reader should judge that and other people. I suppose the probiotic stuff is probably the most important. That is the ones I am quoted for most. But also, I am also quoted for a new way of looking at food allergies. And other stuff I should have published that I haven't published. It is very exciting. My problem is that I have the ideas, I know what should be done but then I need somebody else to do the crossing the eyes. Christine Wickens, for example, was fantastic in that, that I would bring the ideas and she would put them all down on paper, and then she would send it back to me and say, "*what do you think*?" I would say, '*well change this change that and change it.'* So probably the probiotic stuff, maybe the food allergy stuff, I have done radio interview on milk allergy, which I am told by many clinicians, they found very helpful. I have been a contributor to quite a lot of research in epilepsy, mainly by finding cases and sending in their details

What has been the impact of your research?

"Ask questions all the time, don't accept anything as being true just because someone says it is, without exploring it yourself"

Dr Thorsten Stanley

I am a bit disappointed that in the probiotic area, there is been very stupid review articles on probiotics, they have said, for example, "there are 20 articles on probiotics", maybe I am just making up the number, "giving probiotics to prevent allergy, we have done a meta-analysis of all 20. And when you add them all up, the outcome suggests there is no effect".

Therefore, we can not recommend probiotics for treatment value. There are three really good studies of which one is ours, showing a very strong effect in preventing allergies. There are other studies using completely different organisms, sometimes poorly done, which were included in the same analyses, and they put them all together and say, overall, there is no effect. If you have 20 really bad studies and three really good studies, the overall result is no effect. I find that really, really disappointing. I think people should be saying, this really was exciting, we need to try and replicate that and do it exactly the same way and see if they actually comes up.

Our study and the Finnish study before it using a slightly different organism, showed exactly the same outcome. That is very strong to me. Then other people subsequently did slightly different studies and then find some different outcome, but nobody really replicated it. We are the only people in the world to actually compare two probiotic species to show that one was effective, and the other one didn't do anything. They're all called probiotics. But it is a bit like saying antibiotics do not work for tuberculosis. Well, of course, if you give them amoxicillin or give them cephalosporin or erythromycin, they die of their tuberculosis, it doesn't work. If you give them gentamicin, or kanamycin or streptomycin or another anti-tuberculous medication, then they do survive. So you must select the RIGHT probiotic.

What are your professional goals in the next five years?

I am 70 now, so my professional goals now are probably to gradually, over time do less research, or do research which it doesn't have a 10 year outcome before it can be analysed. I think also now use my skills that I have in broad thinking to be part of research teams. We are not actually expected to be there right to the end, but be there at the beginning and help with the initial planning and getting the things right. I do need to publish my discovery of the role of faecal calprotectin as a diagnostic test for non-IgE food allergy.

What are the big issues in your research area?

Well, I have several different research areas so that the whole allergy, which includes asthma, hay fever, eczema, food allergy. So food allergy is an enormous thing that needs to be worked on. I mean, obviously, I am also very much involved with Marina's group here. With infection control, and prevention of infection is another big area. I would say probably allergy prevention and understanding the whole epidemic of these conditions like allergies; but there are several others, which are becoming very common, and which are replacing infectious diseases. So humankind is not getting any better. The

other one that I would have loved to get into, except that I would have probably shot myself in the foot because I would have had the same success as everyone else, is working on obesity and obesity prevention, because for humankind, that is probably going to be the biggest issue. Unfortunately, it has so much anathema attached, so much social stigma. And people can not explore it properly. When I have obese children and I try to talk to families about the fact that their child is obese, the parents eyes glaze over and the shutters come down.

I know then, that I am no longer communicating effectively, they're just looking at me. This is an *enormous epidemic*. But it is not just an epidemic, but it is actually an epidemic that is taking off at a remarkable speed. It is a bit like global warming, but whereas everyone getting very excited about the global warming thing, we really have to do something with obesity, people aren't saying the same thing. And New Zealand, the media is terrible about talking about it, and it is terrible.

The last article I read about on *Stuff* about obesity said it is a mistake, somebody said, what we need to do is change our norms. The people we are calling obese, we should just call normal, we should stop talking about it. We should just call those normal people. The people that are healthily shaped that we use called normal, will put them into zoos or into shows or into circuses. We can all look at them and see how human beings used to be and say, *'Oh, look at that, is not that interesting? That is what a human being used to look like.'* And the rest of us can wander around or sit around. That is what he suggested should be the new norm. CRAZY! We are looking at an epidemic of kidney transplants for obese people. Obesity is one area that theoretically I would have liked to get into but I can not.

Why not?

I am too old, and it is also too difficult. And it is also very endocrine. I do not have those skills. It is a lot of guts and endocrine and behaviours and social pressures and I am more interested in how to solve allergy.

How do you balance your time? If you are facing several challenges came up to the same time like grant deadline, teaching commitments, family, how would you prioritize?

I am probably not as good as I should be. I have got a relatively short attention span, so that I do not actually really enjoy spending many hours on the same task. I tend to be a person that does a bit and then I go off and do something, maybe go for a cycle ride or swim. Then I come back to it feeling refreshed rather than the sort of person that sticks to one thing. But I, (like many males?), also have the problem of putting things off. Of course, if you have a very large number of things that are coming at you at the same time, you tend to put things in order of urgency. And if you are a clinician, the patient has trump card every time. So whatever you are doing, if somebody phones to say their child is just having a long seizure, what should I do? You can not say, hang on a second, I am in the middle of research paper, you say, okay, hang on. Yes, I'll come straight away. So with clinicians there is always the problem that the clinical problems take first place. The extra challenge that we have had now is that when I first arrived in Wellington, there were no computers; they hadn't been invented, there was no email, there was no internet. What you got when you first came in the morning was your dictations, from yesterday to read through, which came in paper form, and then you put pencil marks on them. Then you would take them back through to the typist, and she would twink out the bits that she would made a mistake of, and put in the right letter again, and bring the letter back to you. Then you'd read through it and then you'd sign them. That was one part of your day, the

next part of the day was waiting for the mail to arrive, and it came twice a day. You read your mail, after that, that was your day, unless you were on call for clinical stuff, then you could decide whether you wanted to do some research, but the research involved going down to the library. Because there was no internet. You had to go and get all these journals out, sometimes down to the basement and had to roll out all these shelves that live in the basement. If you want to find any recent research, you had to go to a tome of what was about 50 different volumes called the index medicus. Go through them and try to find the particular subject that you wanted – hoping you found the right subject within these alphabetical things and then try to find that journal on the shelves. And if not, go to the librarian and ask for an interloan and get someone to send that journal, and photocopy it – and that is very time-consuming slow stuff. There was not the same email interventions, there were no texts, there was nothing to interrupt you, an occasional phone call and your beeper.

So now life is very different. We have many more things to balance. So to come back to your question, rather than long-term study on one thing, I tend to get bored after a bit, and then I'll go do something else. And then I'll come home. And I'll say, *'oh'*, and visit these emails that I haven't responded to, and I'll start doing them. I actually do a lot of work from home. I am known to be answering emails at one or two in the morning. I am not asleep yet. So I tend to spread out my work. Of course, if there is something that needs finishing, like there is a timeline, a deadline then I tend to work day and night to finish it off. But that is typical male behaviour, I think that you leave everything to the last minute. My male children have done exactly the same thing when they're going through school and university. They've also left everything to the very last minute. I do not think necessarily, it is a bad thing. Because I think, and I have noticed with many things that I have been asked been asked to do, when you are given something to do, the moment you are given it, your brain is actually already beginning to work its way through that subconsciously and even when you are doing other stuff, your brain still working through it. So I find that with talks, or lectures, I have been given a lecture months in advance to prepare, and I still do it the day before or the night before. But actually, it is all in there when I do it because my brain has been sorting it out all that time. I have just left it to the last minute but it comes out then. It flows out really well. I do not think that leaving things last minute is necessarily a bad thing.

What has been the most productive period in your research career and why?

Well, there was a period and one day I was I used to do some research largely by myself and I had a few other people that I worked with. Then one day I arrived at Heathrow Airport, and on the plane was Julian and Kristen. What I remember while we are standing waiting for our luggage to come off the rack because we are both going to the same allergy meeting, Julian said something along the lines, *"Hey, Tosh! You got a different way of thinking and I really think that you should consider whether you do not want to be part of our research team. We had paediatricians in the past, but none of them seem to have your sort of characteristic – lateral thinking ideas, do give some thought to joining us!"*

And that sparked off a period of 15 years of collaboration, and I still maintain contact with Kristen who has recently retired, and Julian's slowing down a bit perhaps. But we last met about a month ago and talked about research. I think that 15 years or so of cooperation, has been the most productive. It has been the most, it is actually, for me, demonstrated for me just how much fun research can be. When you are in a group of people. They all have lots of fascinating things to say. Julian's also a

very entertaining lateral thinker. He's got a huge, wide range of interests.

What advice would you give young adults aspiring to pursue research while being in the medical field, even having a family?

Joining a team. I think also, ring fencing time that you say this is my research; clinical work is not going to go into this area, this is finally only perhaps turning off your phone, perhaps not looking at your emails. I look at my emails all the time but maybe one should not do that and know other people who do that. But on the other hand, even those who are very productive researchers, you know if you send them an email there, you still get a reply in five minutes, they're all doing the same thing. They're all looking at their emails, because they are so enthusiastic about what they're doing: it is such fun, they're constantly wanting to find the very most recent results and things so they're always on their emails looking. So I would say when I first arrived in Wellington the expectation was that I would do some research. The expectation was never given to me that I should have a higher degree, which I didn't do.

Maybe I should have done. Without a higher degree you can not advance up the academic scale. I think I was poorly supported when I first arrived from point of view research, they expected me to arrive and immediately just start producing papers. I came straight into a huge clinic filled with enormous hours, and I was on call every second night. I was on-call every second weekend. When I was on-call, I worked very hard with a lot of sleepless nights. So you didn't really have time left behind start building a research career. I have seen young colleagues, because I am older than all of them, work their way through research career. They all had that support that I never had. There were no senior paediatric researchers that actually took me aside and said, Tosh we need to do this and this. So it is only when I met Julian and joined the team that things started becoming really productive. And that will be my recommendation for a new member of staff, make sure that you have good peer support, senior people that actually look after you. Be sure that you actually form part of a team. Even if in the fullness of time, you are going to want to do stuff on your own or be the head of a team, make sure you are part of a team from the start. You can actually experience how a good research team works. And I think also, even though some brilliant people do original research sitting isolated in funny places, that the majority of research takes place in places where there are already functional research teams operating. So make sure you are going into a place where there is clear research funding.

I would like to ask if there is something you can impart to us in any aspects, what would that be?

It would be ask questions all the time, do not accept anything as being true just because someone says it is, without exploring it yourself, whatever happens. I said the same thing to students and junior doctors, if they can. A student today presented a case and he put the title up and it said what the diagnosis was. I said, we shouldn't title up of what the diagnosis is, we should be able to work that out for ourselves. You should just tell us what the presenting symptoms are. So we can actually explore it freshly for ourselves. And then we can decide whether we agree with you that 'that is actually the diagnosis'. We do not want you to tell us the diagnosis, we want to formulate for ourselves and the students.

The students also seem to accept what somebody else has done. I think in research you should be open minded, and you should question everything and everybody and ask them – How do you reach that conclusion? Where is your evidence for that? Right when I first arrived in New Zealand, actually having come from another country, from Scotland, which is in this regard better than England, that when I first arrived, I was teaching some

students or junior doctors and I said, "such and such, such and such". And if I'd said that in Scotland, (or England, even worse), the students would say, okay, doctor, you are the boss, and they would write it down. Instead, there were very clever students that I was teaching, and they said *'Dr Stanley where's your evidence for that?' Pardon me*, I thought to myself – *I am the senior person and you are a student, how dare you ask me where's my evidence?* And then I thought, - *'Hey, I like this! I really like this!'* I actually had to justify what I said. However junior you are, I think that is forming a good research brain is to question everything. Even the stuff that is widely accepted as true, half of it is not.

I have had the Julian Crane cooperation on one side. The same thing has happened, of course, on the CCDHB side with Marina Dzhelali who's another amazing person, and also generates a team that works really, really well. She has completely revolutionized research on the hospital side. For the first 30 years I was in Wellington, the hospital did virtually no research at all in child health. There was only the university that started new research. The hospital was completely useless. When it came to attracting research, since Marina's arrival, that is when things have really taken off. And suddenly, we are now regarded as a go-to-place the drug companies come to us saying, we want to work with you. We are getting lots and lots of people writing saying, we know that you guys can do the work. So it is another teamwork thing.

-End of Interview-

Paediatric surgery

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Presentations

Invited National/International Lectures

- Talks on Paediatric HPB trauma & Intestinal malrotation in adults. RACS 88th Annual Scientific Congress, Bangkok, Thailand, May 2019
- **Stringer** MD. Therapeutic strategies for neonatal hepatic haemangioendothelioma with heart failure. 52nd Pacific Association of Paediatric Surgeons Annual Scientific Meeting, Christchurch March 2019
- **Stringer** MD, Raghu K. Variable presentation of intestinal malrotation in extremely premature infants. Poster. 52nd Pacific Association of Paediatric Surgeons Annual Scientific Meeting, Christchurch March 2019

Conference presentations by students & co-researchers (2008+)

- Hale S, **Stringer** MD. "It is only a torpedo": Raymond Jack Last and the sinking of the Napier Star. RACS 88th Annual Scientific Congress, Bangkok, Thailand, May 2019 (poster).
- **Meiyappan V**, Berry M, Robertson O, Pierse N, **Stringer** MD. Long-term outcomes of gastroschisis in New Zealand. 52nd Pacific Association of Paediatric Surgeons Annual Scientific Meeting, Christchurch March 2019. **ANZAPS Prize for best presentation**
- Parker OM, Kenwright D, **Stringer** MD. Heterotopic gastric mucosa associated with jejunal atresia: a management dilemma. Poster. 52nd Pacific Association of Paediatric Surgeons Annual Scientific Meeting, Christchurch March 2019
- Taghavi K, Goddard L, Evans SM, Hobson A, Beasley SW, Sankaran S, Kukkady A,

Stevenson J, **Stringer** MD. Contemporary management of Hirschsprung disease in New Zealand. 52nd Pacific Association of Paediatric Surgeons Annual Scientific Meeting, Christchurch March 2019

Summer Scholarship Students

- 2018-2019 **Olivia Parker** (2nd year Med student) Cure Kids "Heterotopic gastric mucosa associated with jejunal atresia" J Pediatr Surg Case Reports 2019.
- Publications, Posters and presentations in the preceding 2 years.
- Evaluation of website information provided by paediatric surgery centres in Australia and New Zealand. **V Meiyappan, T Little & P Jackson.** ANZ J Surgery 2019 PMID: 30685891
- Blood transfusion for anaemia of prematurity: Current practice in Australia and New Zealand. **Maria Saito-Benz, Meghan E Sandle, P Jackson & Max J Berry.** J Paediatr Child Health 2019 Apr55($):433-440 PMID: 30246273
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- Beyond Google: are we providing accessible information to NICU patients? **Katherine Lynch, Maria Saito-Benz & Paul Jackson.** Combined meeting of Pacific Association of Paediatric Surgeons (PAPS), Australia and New Zealand Association of Paediatric Surgeons (ANZAPS) and New Zealand Society of Paediatric Surgeons (NZSPS) Christchurch 2019
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Featured Researcher – Maria Saito-Benz

Dr. Maria Saito-Benz
Neonatologist, Child Health

Tell me about your research and your research experience? What is it about? When did you start?

My background is that I am a neonatologist. I look after babies who need intensive care in echo unit. When I was an advanced trainee, I developed an interest in research, because I felt that there was a gap in our knowledge. Outcomes in survivals of babies who are born, very premature have really improved in the last decade or two. When we look at neurological outcome of some of our survivors, there is definitely a room for improvement. I became really interested in how we can better protect the brain of premature babies.

And that is how my research journey started. I was lucky enough to be working with my colleagues who were clinical academics – that is Max Berry, who's my PhD supervisor, and who supported me in doing research in looking at how we can stabilize oxygen level in the brain of premature babies, how we can introduce new technologies into clinical practice to improve outcome, so our babies can live a good life.

So what is innovative about your research?

So it is a clinical and pragmatic research of introducing new technologies into clinical practice and how that can improve outcome of babies. It is innovative in a way that we are looking at protecting the brain of babies in a

way that we haven't done so in the past, improving the way we monitor and look after these babies, and non-invasively that from early on in life.

Have you had research prior to this?

Like a lot of my clinical colleagues I dipped in and out of different research projects, throughout training. I actually started off my career being interested in infectious diseases, and did a Master's degree in infectious diseases first, and spent a couple of years working in South Africa when I was a surgeon. My PhD was the very first time when I dedicated a solid amount of time to design my own study, and that is been a really exciting journey.

Do you have more than one research or just want to move on?

We have got couple of different research projects going on. One area of my interest is looking at how blood transfusion affects brain functioning in premature babies, and looking at timing of blood transfusion, as well as the way we prepare and store our red blood cells in.

Does it affect how it improve brain function in babies?

That is one area of my research and the other is looking at how we can support these premature babies in the first few days of life and their most vulnerable. And so I have got a couple of different areas of interests.

So which do you think is the most significant research accomplishments so far?

I think it is too early to say, a significant research accomplishment. I think for me what's really exciting is that steers different research projects, and conference presentations, we are beginning to expand our team. It is not just me doing this research, we have got a team of, nurses and doctors who are excited about doing this and I think I'd say probably the biggest accomplishment is actually, developing a research team.

Which of your research projects are you enjoying the most?

I think I really like all of the projects, for different reasons. I am really proud of a recent study that I looked at – irradiation policy with regards to red blood cell transfusion, because I think it is got a real translatable value into clinical practice. It is drawing a lot of interest, within the haematology circle. I have already enjoyed the trials that I am immediately translatable into clinical practice, because I think I am quite a pragmatic person.

How do you manage your time between a neonatal consultant or researcher and family time? How do you balance your time with challenge, like everyone else?

I feel that 24 hours in a day is not enough, seven days is not enough in a week. But I do the best I can to get the job done. I try not to be too harsh on myself. There is always a next week. I think having my family support in doing what I do is a big, big part of, what I do. I think my family are proud of my job, as well as my research interest. I am very lucky to have support from my colleagues as well as my family. It is a great thing that family supports you to do whatever you want to do, and until when you want to do.

What influenced you the most to choose your current field in research?

I would say I think when I moved from the UK, with my family to New Zealand in 2013. I was really inspired by my current clinical director, Dr. Richardson, who's now close to retirement, and that, he's always pushed boundaries in your current clinical practice in how we can do things better for our patients. I think that is the momentum of just wanting to do better for every patient in front of us is what's really driven me to want to do research to how we can protect baby's brain and healthy development.

What has been the impact of your research to you as a person, as a consultant?

I think the biggest impact is that doing research has reminded me that, even as a consultant, there is still a lot of unknown out there. We do the best we can to look after patients in front of us – that there is more that we should be able to do and I think being

involved in research has really inspired me to ask more questions, and not just asking in terms of, has anyone else found out answer for this? Can we be the leading centre in answering those important questions? I think that is the biggest impact that being a clinical academic has had on me.

How do you think this will contribute to our community?

In New Zealand especially, we know that the less privileged groups in society are over-represented in our pre-term group of patients, like babies who unfortunately goes through this.

I think that trying to improve the outcome of the risk these group of babies in neonatal unit, I think and hope it is going to help towards towards, equality and equity in our community.

What will you focus on, and what gives you a competitive edge in this area?

My research until now, has really been quite labor intensive, in collecting, physiological data by the bedside using a lot of manual technologies. I think the last four years of research have really taught me that if we want to do research of this nature, on a big scale, then we need to embrace the new technology. As a unit, we have recently invested in, automated neurocritical care data collection platform. I think what's really exciting here in Wellington is that now we are at a point where we can start collecting data that we have done manually – very labor intensively in a lot more automated fashion. I think that is really exciting for us, and that is good.

What are your future goals? In terms of research? What are your professional goals in the next five and 10 years in terms of DHB wise, or your research plans?

> *"Research is about discovering the truth"*
>
> Dr Maria Saito-Benz
>
> Neonatal Consultant, Child Health

We have lots of exciting, in-house physiological studies going on at the moment. I would like to see myself in 5-10 years' time leading some of the more regional multicentre trials, starting from here in Wellington where I am a consultant neonatologist. I think supporting the new generation of paediatricians and neonatal trainees, our nursing colleagues who are excited in being part of the research. I am looking forward to support them, and nurture their interest in a way that my mentors and advisors have done for me.

If you can impart something you have learned in the academy and journey, what would you want to share with us?

So, there is someone that I really respect that have said to me right at the start of my research journey - which is that negative finding is just as important as positive finding. Research is about discovering the truth and I think that has really stayed with me all these years. Because so often, we get caught up on wanting to get a positive outcome, but that is the science is about finding the truth. And that is something that I always remember to remind my junior colleagues, whether it is a simple audit or a small project or, laboratory based project, I think it is really important to remind yourself.

-End of Interview-

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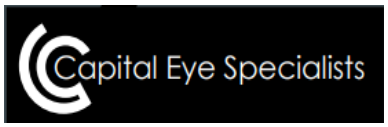

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