



Tait Paramedicine Scholarships Postgraduate Scholarship Winners

Research Reports 2021

Postgraduate Scholarship Winners – Paramedics

Paramedics (PARAs) are capable of delivering some medicines specific to patients requiring pain relief, in shock, or who are continuously fitting. Officers at this level have either completed an internal education package, or have completed a Bachelor of Health Science in Paramedicine.



Andrew Odgers

Paramedic

Works for St John in Christchurch. With a desire for personal development he also works as a Volunteer Team Manager, facilitating peer development, works with the Australasian College of Paramedicine and also NZ Society for Mountain Medicine. He is a Right Care SME. Andrew's scholarship is awarded for Integrative Research & Practice Reality.



Megan Parr (Completion 2022)

Paramedic

Works for St John in the Marlborough region. She has a strong interest in rural healthcare and health equity. She is the Right Care SME for Marlborough and also has an interest in low acuity plans and managing patients in the community. Megan's scholarship is awarded for Advanced Assessment & Diagnostic Reasoning.



Tracey Parks

Paramedic

Works full time for St John in Nelson Bays. Tracey was a St John Cadet and prior to her ambulance career she was a Public Health and Registered Nurse. She gained her paramedic qualification in 2013 and qualified BHSc in 2016. Tracey's scholarship is awarded for study of Pharmacology Science and Therapeutics.



Jordan Retemeyer (Completion 2022)

Paramedic

Works for St John in Whakatane, Jordan started his ambulance career in Rotorua before moving to Auckland where he completed his training. He has a keen interest in mentoring and precepting the next generation of paramedics. Jordan's scholarship is awarded for study of Health Professional Practice and Clinical Enquiry for Evidence Based Practice.

Andrew Odgers

Integrative Research & Practice Reality

The scholarship study award granted in 2021 allowed me to complete two papers, working towards a PG Diploma in Health Science (Critical Care).

The Integrated Research paper facilitated an understanding on research synthesis, and how this relates to me as both an individual and a paramedic. I chose to focus my study on research on populations of focus, particularly homophobic attitudes, and LGBT positive culture changes. As a person who fits most mainstream societal demographics, this added immense value to me as it helped understand my perceptions, and how these perceptions subconsciously generate tenants of practice. Supplementing this, the paper teaches how to design research which challenges assumed perceptions in a way which adds to the literature bases. I found the paper enlightening and beneficial and see wider value because the development of paramedic centric research is vital in Australasia as the profession develops.

Practice Reality held a focus on understand the impact of practicing paramedicine. Separated into two focusses, the first generates heightened understanding of values and perceptions of health, and how these are generated. This developed comprehension on how I have developed personal values and how different demographics have developed theirs. The second focus of the paper seeks to enlighten participants of how their decisions are made using these values, and how these values interact with recipients of healthcare. Overall, the paper seeks to develop practice which delivers care as intended by the health consumer, a concept popular in NZ Health circles, but appears to be absent in paramedicine. It is a professional valuable and essential paper.

Completing these papers has allowed me to develop both my own decision making and professional identity, and the professional practice of those whose careers I am involved in developing. These papers have concomitant concepts and principles, so studying concurrently has developed paramedicine as a profession, my own practice and how I work within the sector.

These insights would not have been achieved without the support of the NZ Paramedic Trust Board and The Tait Foundation. It must be acknowledged that not all holders of the PG Diploma in Health Science will become specialist paramedics, and I conduct this study knowing that it is possible I may not. However, the study has been enriching and added value to me, and I can only hope to be fortunate enough to share this with others in the profession.

Andrew

Tracey Parks

Pharmacology Science & Therapeutics

Effectiveness of using a fascia block vs intravenous fentanyl pre-hospital, in adults over 65 years with a fractured femur requiring pain relief by paramedics.

Fractured femurs are a common injury in the older adult, with an average age of 82 years, 36 percent (%) having some form of cognitive impairment and those over the age of 90 accounting for 25% of cases. Pre-hospital, only 58% will have been given adequate pain relief (Australian and New Zealand Hip Fracture Registry [ANZHFR], 2020).

As our physiology changes with age so does our pharmacokinetic ability, primarily through the change in renal function. There can be a decrease in hepatic function as the liver ages. Less body muscle, a higher percentage of fat along with a decrease in total body water all prolong the excretion of drugs. Pharmacodynamics changes as well with a reduction in number and sensitivity of receptors in the central nervous system, leading to toxicity from drugs such as opioids (McKearney & Coleman, 2020., Robinson, 2021).

Hards et al. (2018) completed a literature review of seven studies, out of 254 FICB that were performed pre-hospital 90% achieved full sensory block. Most FICB were done using the landmark two-pop method, with a range of personnel involved including paramedics, physicians and nurses. This showed FICB is a simple and safe procedure pre-hospital (Hards et al, 2018). Davis et al. (2021) found that fractured femurs were typically under managed in the prehospital environment. Reasons for this include cognitive impairment, and hemodynamic stability concerns when using IV analgesia (Davis et al, 2021). FICB when used was both effective and safe, with few adverse events reported compared to the control groups (Davis et al, 2021., Hards et al, 2018). Across 36 Australian hospitals 29% of patients had no record of analgesia in the emergency department with 50% of those not receiving any prior to arrival (Scurrah et al, 2018).

Region nerve blocks such as FICB gives rapid long-term pain relief reducing the need for IV analgesia leading to reduced episodes of side effects and overdose from opioids (Scurrah et al, 2018). Research shows that FICB is not only safe but easy to learn with appropriate training in the field by paramedics.

I would like to acknowledge and thank the Trust Board and the Tait Foundation for the scholarship, this has enabled me to further my learning and enable me to progress to Emergency Care Paramedic.

Tracey

Postgraduate Scholarship Winners – Intensive Care Paramedics

Intensive Care Paramedics (ICPs) are specialists in critical care and clinical judgement, with a proven ability to manage complex patients. Often thrust into situations that require complex life-saving procedures. They are capable of administering a wide range of medicines, advanced airway management, and a number of invasive skills.



Shane Bergman

Intensive Care Paramedic

Works for St John in Hawkes Bay. He has achieved his BHSc and PG Certificate in Speciality Care, practicing ICP since 2019, and now studying towards PGDipHSc. Shane is a member of the USAR Team and previously a paramedic crewman with the HB Rescue Helicopter. Shane's scholarship is awarded for study of Advanced Resuscitation.



Kevin Stickney (Completion 2022)

Intensive Care Paramedic

Works for St John in Palmerston North, previously in Auckland. He has achieved a BHSc and Post Graduate Diploma in Health Science. He is part of the Clinical Development Team running simulation clinics to prepare interns for their next step. Kevin's scholarship is awarded for Research in Practice to complete his Master of Health Practice.



Elizabeth Wakelin

Intensive Care Paramedic

Works for St John in Whangarei. She holds a Graduate Certificate in Emergency Management and a BHSc in Paramedicine. Her main interest is to move into Primary Health Care and is currently working towards her Post Graduate Diploma in Health Science (ECP). Elizabeth's scholarship is awarded for study of Advanced Assessment & Diagnostic Reasoning.

Shane Bergman

Advanced Resuscitation

Every day in New Zealand, five people will suffer a cardiac arrest which requires immediate high quality chest compressions and defibrillation. This process of chest compressions is to mimic the physical contraction of the heart, thereby circulating blood through the body to the vital organs in an attempt to re-establish blood flow to the heart and the brain. High-quality chest compressions ensure the correct depth (5-6cm), the rate (100-120), and full release of the chest between compressions, and minimisation of time with no chest compressions which are the underlying importance of resuscitation (Tranberg et al., 2015).

Several initiatives have been developed over time to improve Out of Hospital Cardiac Arrest (OHCA) survival rates and one of those is the introduction of mechanical chest compression devices. With the ever-challenging, chaotic, and uncontrolled environment of OHCA, a mechanical chest compression device could assist the first responders to deliver high-quality continuous Cardiopulmonary Resuscitation (CPR).

Through the **Advanced Resuscitation** paper, my research has shown that manual chest compressions from bystanders is not meeting the current resuscitation recommendations due to insufficient compression rates, depth, and continuity. These shortcomings identified by Lund University Cardiopulmonary Assist System (LUCAS) resulted in the development of the LUCAS Mechanical device to provide high-quality continuous chest compressions eliminating some of the manual chest compression concerns. This LUCAS device is placed over the sternum of the patient and initiate chest compressions

The LUCAS device provides automatic chest compression at the sternum by a piston ensuring a constant rate, fixed depth with the recoil from a suction cup, returning the chest cavity to its normal anatomical position (Smyth, 2011). Manual chest compressions are limited to the first responder's ability to undertake this life-saving measure (Liu et al., 2019), including the physical and mental strength of the rescuer (Szarpak et al., 2016).

In October 2021 I was despatched to a cardiac arrest in a Rapid Response Vehicle (RRV) and on arrival there was bystander CPR in progress. Additional resources to assist me were still minutes away so applied the LUCAS device to this patient which delivered the appropriate CPR. These devices are only in our RRV's and in this particular case, I was successful in managing the cardiac arrest.

I would like to sincerely thank nzparamedic.org and The Tait Foundation for providing scholarships to the ambulance sector, allowing for critical development of our workforce. Your financial support with my study is greatly appreciated as medicine is always a developing and changing environment, and this tertiary education support allows me to be contemporary in my practice.

Shane

Elizabeth Wakelin

Advanced Assessment & Diagnostic Reasoning

Healthcare, and indeed paramedicine, in New Zealand focuses on the holistic needs of the patient. Pathways and referral options to keep patients at home and be treated in the community are being developed and implemented regularly. I decided to undertake my Post Graduate Diploma in Health Sciences focusing on the Extended Care Paramedic pathway last year as I see a great need for this within the Whangarei and wider Northland communities where I currently work. I completed four papers in 2021, and the education cost for this was very high. Having the opportunity to apply for, and subsequently be granted, the Tait Scholarship was extremely appreciated.

The New Zealand Paramedic Education and Research Charitable Trust enables clinicians and future clinicians to provide the best care for patients. With the charity's help, In 2021, I completed the Advanced Assessment & Diagnostic Reasoning paper at AUT university, for which I achieved a "Pass with Distinction" grade. This paper taught me to better understand my patients and to assess not only their presenting complaint, but also their whole wellbeing. This has enabled me to better understand my patients problems and treat and refer them to the most appropriate care. Many patients can be managed in the community and prefer to stay home. My newfound knowledge enables me to safely make that happen.

Without clinicians and researchers upskilling and advancing their own knowledge and experience, the advancement of paramedicine would become stilted. This is integral to meet changing health climates, advancements in health care, and public expectations. With the introduction of the Paramedic Council, and all Paramedics and above required to be registered health professionals, upskilling and keeping up with the ever-changing research-based evidence is paramount to ensure patient and clinician safety within the profession.

This year I am completing my Postgraduate Diploma with my final paper, Community and Remote Area Paramedicine. I would like to express my heartfelt gratitude to the Tait Foundation and all Trust Board members for the scholarship award. I would also like to thank you for the hard work you do to help paramedicine students and researchers realise their passion.

Liz

Postgraduate Scholarship Winners – Extended Care Paramedics

Extended Care Paramedics (ECPs) support patients with urgent, unscheduled primary healthcare needs in a community setting. Specialists in assessing and treating a range of patients requiring care with ear, nose and throat issues, suturing basic wounds, administering oral antibiotics, administering enemas for constipation and managing a blocked urinary catheter.



Katie Clark (Withdrawn)

Extended Care Paramedic

Works for Wellington Free Ambulance and is a preceptor for graduate paramedics. She holds a Bachelor of Biomedical Science from Otago University and a Bachelor of Health Science (Paramedicine) from Whitireia NZ. She is passionate about continuing her education in paramedicine. Katie's scholarship is awarded for Clinical Assessment and Diagnostic Reasoning.



Matthew Hitchiner

Extended Care Paramedic

Works with Wellington Free Ambulance in the Wairarapa. and as a volunteer medic for LandSAR. Previously worked for the London Ambulance Service in Central London. He is particularly interested in helping to promote community health resilience through practice and education. Matthew's scholarship is awarded for the study of Pharmacology Science & Therapeutics.



James Currie

Extended Care Paramedic

Works for Wellington Free Ambulance in the greater Wellington region. He holds roles as an assessor and preceptor and is building relationships with local medical centres and other health providers in the community. He is currently studying towards a postgraduate Diploma in Health Science. James's scholarship is awarded for Pharmacology Science and Therapeutics.



Sandra Holliday

Extended Care Paramedic

Works for St John in South Taranaki. She gained her Masters in Health Practice in 2020 and enjoys applying community health approach to medicine. She is part of the POC Ultrasound trial and will cement her learnings into the Ultrasound imaging paper being completed at AUT. Sandra's scholarship is awarded for study of Ultrasound Imaging.



Stephen Flett

Extended Care Paramedic

Works for St John in the South Auckland Region and has spent 15 years working amongst Maori and Pacific Islander communities dealing with medical issues that can arise due to cultural needs. He holds a BHSc in Nursing and Paramedicine from AUT. Stephen's scholarship is awarded for study of Advanced Assessment & Diagnostic Reasoning.



Laura Roberstson

Extended Care Paramedic

Works for Wellington Free Ambulance and is a Relief Shift Manager. She holds a BHSc in Exercise Physiology and Paramedicine and is completing the Postgraduate Diploma to further her clinical knowledge to serve the community of Porirua with its diverse cultural, social and economic opportunities. Laura's scholarship is awarded for Pharmacology Science and Therapeutics.

James Currie

Pharmacology Science & Therapeutics

In adults with community acquired pneumonia (CAP), does the adjunct use of corticosteroids compared to placebo or control decrease the risk of mortality and/or improve time to clinical stability?

The adjunct use of corticosteroids for severe CAP has been shown to decrease the risk for mortality. An analysis of 11 randomised control trials (RCT) reports a risk ratio of 0.66 95% CI 0.47 – 0.92. In a retrospective cohort study of 177 patients in ICU with COVID-19, 93 participants received 10-60mg of prednisone twice a day, for an average of five days. Mortality rates were reported as 53% in the steroid group and 57% in the control group $p > 0.05$.

Corticosteroids can reduce the time to clinical; a small RCT of patients with severe CAP comparing 50 people after 7 days of treatment, days to clinical stability was reduced in the steroid group by 4.35 ± 1.24 , compared to 6.54 ± 1.99 in the control group $p = 0.02$.

Consideration should also be made for the adverse effects of systemic steroids. The risk of developing hyperglycaemia was increased with the use of steroids, with an analysis of 7 RCTs, the risk ratio was 1.72 95% CI 3.8-2.41 $p < 0.001$. Another adverse effect is the immunosuppressant effect: a population study of 327,452 participants showed an increase in the risk of sepsis developing within a 30-day period, with an incidence rate ratio of 5.3 95% CI 3.8 – 7.41 $p < 0.001$

For the severe subgroup, the adverse effects of hyperglycaemia and risk of developing secondary infection do not outweigh the effects and can benefit the patient. In the non-severe cases of CAP there is a smaller amount of evidence to support the use of steroids, as there is no significant change in risk of mortality and no overt reporting on the time to clinical stability or cure. There is not enough supporting evidence in non-severe CAP to currently outweigh the risk of adverse effects, and administration should be withheld until further studies can be conducted. This highlights an area for further investigation.

I wish to acknowledge and thank the Trust Board and the Tait Foundation for their generous scholarship towards my study in Pharmacology. With their support, I can further my studies and education within community paramedicine. I wish to use my education to work in partnership with my community, to help improve health outcomes and quality of life.

James

Stephen Flett

Advanced Assessment & Diagnostic Reasoning

For my scholarship subject Advanced Assessment & Diagnostic Reasoning paper I gained much learning for two main fields of study.

The first field was a written assignment on diagnostic testing, of which I chose the HbA1c test for diabetes and pre diabetes and existing health disparities in NZ, especially concerning type 2 diabetes in the Māori and Pasifik communities. We looked at patient care following a positive result for type 2 diabetes and its potential impact on the patient and their whānau. It appears the Hba1c test needs further research and development, and at present, is best used in conjunction with other tests, such as FPG and OGTT.

It is also evident that Māori and Pasifik peoples are significantly disadvantaged in terms of health equities. Moreover, these health inequities will necessitate a substantial cultural shift and fundamental institutional transformation in NZ's health and disability system. Diabetes affects all people and warrants an increase in research and support to help improve diabetes control and achieve better health outcomes for patients and their whānau. It is people who matter, as this Māori whakatauki/proverb says:

he aha te mea nui o te ao - he tangata, he tangata, he tangata.

What is the most important thing in this world – It is people, it is people, it is people.

The second field of study was learning and memorising a vast number of detailed clinical examinations which included: Abbreviated Cranial Nerve Examination, Abdominal Clinical Examination, Ankle and foot Examination, Cardiovascular Examination, Elbow Examination, Hand and Wrist Examination, Hip Examination, Knee Examination, Lower Limb Neuro Examination, Respiratory Examination, Shoulder Examination, Spine Examination, Upper Limb Neuro Examination.

This was very practical and absolutely utilised on a daily basis in my role as an Extended Care Paramedic.

Because of the generosity of the Trust Board and The Tait Foundation I have been able to understand and accommodate into my daily practice my learnings from this most helpful paper. I have been able to converse more concisely with the patient's own GP and other health professionals – gaining their support and utilising their services more appropriately for my patients.

Stephen.

Matthew Hitchiner

Pharmacology Science & Therapeutics

It wasn't until Raephael Mechoulam and his team identified and isolated the individual active substance responsible for psychoactivity, delta-9-tetrahydrocannabinol (THC), that the renaissance of the ancient medicine, cannabis, began.

Activation of cannabinoid receptors by endogenous or extraneously cannabinoids has multiple analgesic-associated effects mediated by receptors in the peripheral and central nervous system. Within the brain, the activation of the G-protein-coupled cannabinoid receptor CB-1, located in the limbic and cortical system, inhibits GABA release and alters the emotional component of pain. At the spinal level and peripheral tissues, activation of cannabinoid receptor CB-2 inhibits ascending nociceptive neurotransmission and neural sensitization, which leads to a reduction of both acute and chronic pain.

It is as recent as 2018 that New Zealand legislators de-listed CBD from the controlled-drug registry, but only for Multiple Sclerosis (MS) spasticity that is refractory to other analgesia. There is no funding currently available through PHARMAC for any CBD product, with an annual cost of approximately \$14,500 for PHARMAC-approved indications. The Medicines Act 1981 enables New Zealand doctors to prescribe CBD for unapproved uses at their own risk, as the prescription remains outside the Medsafe safety-net. With the underlying principles of all medical professionals to '*primum non nocere*', the discourse represents an ethical dilemma that is creating divides amongst clinicians, and pushing the public to seek products with poorly regulated THC levels.

Although there remains a lack of strong evidence supporting the efficacy of CBD, patients should be cautiously-optimistic of future legislative changes that will open the door for further approved uses of CBD within the New Zealand primary healthcare.

Study of this pharmacology module was made possible by the generous grant received through the Tait Foundation, for which I am very grateful. I thank the Trust Board for the continued support with assisting to further Extended Care Paramedics in New Zealand, which reflects a desire to support the modernisation of the paramedic profession to deliver a world-leading service to the New Zealand community.

Matthew

Sandra Holliday

Ultrasound Imaging

Point-of-care ultrasound (POCUS) in a New Zealand ambulance setting is a relatively new concept, and is poised to fit in well with Extended Care Paramedic (ECP) content for such conditions as urinary retention, lung pathology, and wound care, to name a few.

I began this paper with absolutely no ultrasound knowledge and, by the end of the course, I am now able to recognise many internal organs and several different medical conditions. We explored the use of 3 distinct types of transducers (linear, curvilinear and phased array), each with their own positives and negatives, to see different organ structures at different depths. I learnt which artefact was a useful artefact (A-lines, B-lines, mirror image), and which made it difficult to see any organ at all (scatter artefact e.g., bowel gas).

During the course I completed 2 written assignments (A average) and 2 days of hands-on experience in Wellington with Hannah Latta, an experienced flight medic, who is currently undertaking research in the use of POCUS ultrasound in PEA cardiac arrest. We also had weekly video conference meetings with an ultrasound specialist discussing the use of ultrasound in their area of expertise (cardiac, respiratory, abdominal etc), and these experts were also present on our 2 hands-on days.

These 2 days were instrumental in cementing my skills of ultrasound acquisition and dexterity, negotiating the different plains required to visualise the entire organ. I also learnt, and practiced, how to insert a needle catheter under ultrasound for intravenous access and fascia iliac blocks, for those more challenging patients with difficult vein access and pelvic concerns.

I would like to extend my heartfelt appreciation and thanks to the New Zealand Paramedic Education & Research Charitable Trust Board, and the Tait Foundation for awarding me this scholarship to continue my ECP upskilling. To be able to begin my study in the use of ultrasound in an extended care setting has encouraged me to continue studying this topic over the next couple of years and I look forward to the time we can use these skills being used on the road.

Sandra

Laura Robertson

Pharmacology Science & Therapeutics

The support received from The Tait Foundation scholarship has enabled me to study Pharmacology Science and Therapeutics (PHMY803) through AUT. This paper was selected as part of the Postgraduate Diploma in Health Science, which I am completing over a two year period to develop my skills and expertise as a practicing Extended Care Paramedic (ECP).

This paper allowed me to develop a better understanding of the fundamentals of medication use through learning the key principles of drug development, clinical drug trials and pharmacology science. It also explored the implications of pharmacotherapeutics for health professional practice specifically from a legal, economical and professional view. These learnings allowed me to better understand the implications of medication use and the wider picture of how a medication becomes funded within New Zealand.

I completed a research case study as part of the formal assessment process. This related to a patient in the community being treated for a long term rare health condition with three different medications. The research required delving into the concepts of medication administration, how the medication works pharmacologically, how medications are approved and administered in line with NZ legislation but also the social impacts of the disease and medication on the patient and whanau.

This research allowed me the opportunity to reflect on my own personal practice as an Extended Care Paramedic and how utilizing packages of medication and wrap around care to keep people in the community and link in with general practitioners could potentially be affected by their current medicine regime, their social circumstance and their family.

By having a greater understanding of these principles, I have developed my personal professional practice to an advanced level, allowing for greater patient care in the community and greater understanding of the underpinning principles of pharmacology.

I would like to take this opportunity to thank the New Zealand Paramedic Education & Research Charitable Trust and The Tait Foundation for their generous support. Their contribution allowed me to pursue my passion for pre hospital medicine and further my skills as an ECP without the stress of financial hardship.

Laura



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