

Summer Studentships 2026/2027

PROJECT TITLE:

Evaluating the Impact of the Wellington Hospital Emergency Department Atrial Fibrillation Clinical Pathway: A Retrospective Pre–Post Comparative Cohort Study

AIM:

To evaluate the impact of a newly implemented atrial fibrillation (AF) clinical pathway at Wellington Hospital Emergency Department by comparing pre- and post-pathway cohorts across clinically important outcomes. The primary outcome is time from first clinician assessment to ED discharge or admission. Secondary outcomes include rates of successful rate and rhythm control, anticoagulation prescribing appropriateness against the CHA2DS2-VA framework, 30-day, and 90-day re-presentation rates, major adverse cardiovascular events, and all-cause mortality.

METHODS:

Single-centre retrospective pre–post comparative cohort study at Wellington Hospital Emergency Department. Cohort A comprises all eligible presentations in the six months immediately prior to AF pathway implementation (historical control); Cohort B comprises all eligible presentations in the six months immediately following implementation. Eligible patients are adults aged 16 years or older presenting with AF confirmed on 12-lead ECG as the primary reason for attendance. Presentations attributable to AF secondary to an acute intercurrent illness requiring admission (sepsis, pulmonary embolism, acute renal failure, pulmonary oedema, or acute coronary syndrome) are excluded, consistent with the pathway's own exclusion criteria. Based on comparable New Zealand ED data, approximately 200 eligible presentations per cohort period are anticipated, providing adequate precision for primary and secondary outcome estimates and sufficient power to detect a 15 percentage-point difference in anticoagulation prescribing rates at 80% power (two-sided alpha 0.05).

Data will be extracted from electronic health records (Single Clinical Portal), the hospital data storage unit, cardiology outpatient records, and hospital discharge summaries. A standardised data extraction protocol and pre-specified data dictionary will be used across both cohort periods. Variables extracted will include: demographic variables (age, biological sex, prioritised ethnicity and Charlson comorbidity index); clinical history variables (AF classification, CHA2DS2-VA score components, presence of structural heart disease, prior anticoagulation and rate or rhythm control therapy); presentation variables (Triage category, estimated AF duration, heart rate, blood pressure, symptoms, precipitating trigger, Cardiology Registrar involvement); management variables (rate-control strategy, pharmacological and electrical cardioversion, anticoagulation prescribed); and discharge and follow-up variables (discharge prescriptions, GP follow-up, cardiology referral type). Structural heart disease will be classified as present if confirmed on formal echocardiography, or assumed absent if QRS morphology, auscultation, and chest radiograph cardiothoracic ratio are all within normal limits, with this assumption documented. Ethical approval and REDCap database configuration will be completed by the supervisory team before data collection commences. All data will be

de-identified and stored on the University of Otago REDCap secure server in compliance with data confidentiality policies.

RESEARCH SIGNIFICANCE:

Atrial fibrillation is the most common sustained cardiac arrhythmia and one of the most preventable causes of ischaemic stroke in Aotearoa New Zealand. It affects around 2–3% of New Zealand adults, rising to at least 5% in those over 65, and prevalence will grow with an ageing population. Up to 40% of patients presenting with AF to New Zealand and Australian EDs have historically been admitted to hospital; a figure that carries substantial implications for bed occupancy, ED flow, and downstream acute care costs. Anticoagulation prescribing at ED discharge has been similarly inconsistent: national primary care data show only 60.5% of high-risk New Zealand patients with AF were taking anticoagulants. The Christchurch Hospital ED AF programme provides the most instructive New Zealand comparator: successive pathway iterations raised anticoagulation prescribing from 45% to 83% without any increase in 60-day thromboembolic or bleeding events, and demonstrated that a structured, evidence-based approach to AF management can reduce admissions and re-presentations whilst maintaining patient safety. Formalised AF pathways incorporating oral-first rate control, structured discharge criteria, and early outpatient follow-up offer a clinically and systemically important opportunity to shorten ED length of stay, reduce avoidable admissions, and improve the continuity of anticoagulation care, priorities explicitly aligned with Te Whatu Ora's acute care sustainability agenda and the ACEM high-value emergency care framework. The ACEM Choosing Wisely recommendations identify avoidable acute hospital admission as a target for emergency medicine quality improvement, and structured AF pathways are among the most evidence-supported mechanisms for achieving this in an arrhythmia that accounts for a disproportionate volume of acute cardiac attendances.

STUDENT'S ROLE AND EXPOSURE TO SCIENTIFIC METHOD:

The student will undertake systematic retrospective data extraction from electronic health records, cardiology outpatient records, and hospital discharge summaries across both cohort periods, working within the standardised extraction protocol and pre-specified data dictionary developed by the supervisory team. The role encompasses identification of all eligible presentations in Cohorts A and B, application of inclusion and exclusion criteria, and extraction of the full variable set – demographic, clinical history, presentation, management, anticoagulation, and discharge variables – into the pre-configured REDCap database. Particular attention will be required for CHA2DS2-VA score calculation, structural heart disease classification, and anticoagulation appropriateness adjudication, with the relevant frameworks fully explained and training provided by the supervisory team. Ethics approval and REDCap configuration will be in place before the student commences; no patient contact is involved.

With supervision from Dr Rogan, Dr Collings, and Dr Roberts, and with access to biostatistical support, the student will participate in all stages of analysis: data cleaning, descriptive reporting, pre–post outcome comparisons, and anticoagulation appropriateness adjudication against the CHA2DS2-VA framework. They will be introduced to pre–post comparative study design, the application of validated clinical risk scores in real-world datasets, and health equity research methods.

The studentship concludes with preparation and presentation of a poster summarising findings. Results will also contribute to a formal report to Wellington Hospital governance and, subject to findings, to a peer-reviewed manuscript. The student will attend regular meetings with the full supervisory team and is likely to be involved in discussions with cardiology and ED colleagues about the implications of the findings, an opportunity to see how research evidence is translated into institutional decision-making.

RELEVANT PREVIOUS EXPERIENCE FOR STUDENTS (Education or Research):

Best suited to medical students, given the clinical record interpretation and risk score adjudication involved. No prior research experience is required. The work is desk-based – the student will be office-based alongside other summer students – and suits someone methodical and precise. An interest in cardiology, emergency medicine, or health equity would be an advantage. Some prior familiarity with AF, rate and rhythm control, and anticoagulation principles is helpful but not a prerequisite; the pathway, CHA2DS2-VA framework, and structural heart disease classification criteria will all be fully explained by the supervisory team. REDCap and data management training will be provided. The student will need to be based in Wellington or have reliable access to Wellington Hospital clinical systems.

Main supervisor:	Dr Alice Rogan (Emergency Medicine Specialist)	
Email address:	alice.rogan@otago.ac.nz	
Other Supervisor/s:	Dr Shaun Collings (Senior Cardiology Registrar) and Dr Jennifer Roberts (Cardiology Specialist Nurse), Wellington Hospital Cardiology Department	
Host Department:	Department of Surgery and Critical Care, University of Otago, Wellington	
Location:	Wellington Hospital Emergency Department, Te Whatu Ora Capital, Coast	
	Can students work remotely?	Negotiable but need to be able to access clinical systems so Wellington would be preferred