Abstracts for the Cardiac Society of Australia and New Zealand Annual Scientific Meeting (New Zealand) 2018, 14 – 16 June 2018, Christchurch, New Zealand

Oral Presentations
Young Investigator Award Abstracts

O01
Long-Term Outcome of Patients from the Auckland Region with Spontaneous Coronary Artery Dissection
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2 North Shore Hospital, Auckland, New Zealand
3 Middlemore Hospital, Auckland, New Zealand
4 Grand Hospital de Charleroi, Charleroi, Belgium
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Background: Spontaneous coronary artery dissection (SCAD) is an uncommon but under-recognised cause of acute coronary syndromes, most often affecting younger women.

Methods: Over the last 24 years, all patients from Auckland and Northland undergoing angiography and diagnosed with SCAD were entered into a prospective registry. Patient demographic, clinical and angiographic data were collated. Follow-up coronary angiography was undertaken in a subset.

Results: Between 1994 and 2018, 155 patients experienced 166 events of SCAD. The mean age at index presentation was 49.4 ± 11.1 years and 119 (76%) were female. Atherosclerotic risk factors included overweight or obesity (44%), hypertension (28%), dyslipidaemia (24%), family history of premature ischaemic heart disease (20%), and current smoking (16%). Forty-one (27%) presented with ST-elevation myocardial infarction (STEMI) while 96 (62%) had non-STEMI. The left anterior descending artery was the most frequently affected artery (47%). Treatment was conservative in the majority, but 19 patients underwent coronary artery stenting and four patients had coronary artery bypass grafting. All but two patients survived the index hospital admission. Thirty-nine patients (25%) had subsequent coronary imaging, 3.28 ± 3.18 years later; the majority of coronary dissections had healed. At latest follow-up, 10 patients had suffered from recurrent dissection and 11 had died. At 5 and 10 years, Kaplan-Meier survival was 98.1% and 94.2%, respectively, and survival free of dissection 92.3% and 89.0%, respectively.

Conclusion: SCAD should be considered in all patients, particularly younger females, presenting with an acute coronary syndrome. The long-term clinical and angiographic prognosis is generally favourable.

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O02
Assessment of the Right Ventricle Using 3D Reconstruction
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Background: Transthoracic echocardiography is commonly used for assessment of the Right Ventricle (RV) however accuracy is limited. Magnetic Resonace Imaging (MRI) is currently the accepted modality although not always accessible. Our aim was to re-evaluate a 3D reconstruction tool with transthoracic echocardiography to assess the RV compared to MRI across a variable study population.

Method: In 25 consecutive patients undergoing cardiac MRI with volumetric RV assessment we also performed RV focused transthoracic echocardiogram within 24 hours obtaining 3D images. TomTec 4D 2.0 RV volume tool was applied to reconstruct the RV by four observers. Measurements including ejection fraction (EF), end systolic volume (ESV) and end systolic volume (ESV) were obtained and compared to MRI based measures. Degree of correlation between the four observers was assessed using Chronbach alpha.
Abstract

**Results:** The 25 patients were 53 ± 15 years old, 68% were male and average BMI was 29.23 ± 5.9 kg/m². In 23 of the 25 patients image quality was sufficient for RV reconstruction. Compared to MRI, RV reconstruction underestimated RVEDV by 14.6 ml (±41.2 ml), RVESV by 9.7 ml (±24.7 ml) and RVEF by 0.7% (±10.3%). Chronbach alpha ranged values were 0.82 for RVEDV, 0.87 for RVESV and 0.79 for RVEF.

**Conclusion:** We found the RV can generally be reconstructed from echocardiography to assess size and function using this software. Volumetric parameters were underestimated, with levels of variance that are higher than desirable. Chronbach alpha showed acceptable levels of agreement between four independent observers, suggesting measurements are reproducible.

http://dx.doi.org/10.1016/j.hlc.2018.05.104

**O03**

Rescue Percutaneous Intervention in ST Elevation Myocardial Infarction - Impact of Regional Transfer Delays in the Midland Region - Time Does Matter

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**Background:** In New Zealand (NZ) fibrinolysis remains an important treatment for ST elevation myocardial infarction (STEMI). Rescue percutaneous coronary intervention (rPCI), if performed promptly post failed fibrinolytic therapy impacts favorably on clinical outcomes. We report our experience with rPCI over a 2-year period and compare outcomes with a STEMI population managed with primary PCI (pPCI).

**Methods:** A retrospective study was performed between January 2014 and December 2015 in the Midland region of NZ of STEMI managed by pPCI and transferred from regional to tertiary center for rPCI. Successful reperfusion was defined as TIMI 3 flow post intervention. Clinical outcomes compared at 30 days and 12 months included death, recurrent acute coronary syndrome (ACS), repeat PCI and left ventricular ejection fraction (LVEF).

**Results:** A total of 293 patients with STEMI were identified, 29% (86) requiring rPCI (mean age 62.42 ± 12 SD, 83% males) and 71% (207) undergoing pPCI (62.87 ± 13.24 SD, 70% M). Time delay to reperfusion was significantly longer in the rPCI group (46% ± 12 SD, p = 0.005). These outcomes were noted to correlate to time of reperfusion.

**Conclusion:** Poorer clinical outcomes in STEMI treated with rPCI in the Midland region are related to delays in patient transfers for timely intervention.

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**O04**

Utilisation and Prognostic Value of Cardiac Magnetic Resonance Imaging in Myocarditis

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**Aim:** To explore the cardiac magnetic resonance imaging (CMR) features of myocarditis and its prognostic implications in New Zealand.

**Method:** Retrospective study of all patients >15 years of age admitted with suspected myocarditis who had a CMR at Waitemata District Health Board (WDHB) between 2007-2016.

**Results:** Of the 178 patients admitted during this period with myocarditis, 94 (53%) had a CMR. The median number of days from admission to CMR was 9.5 (IQR 4-51). 22 patients had a reduced left ventricular ejection fraction (LVEF) <50%, which was associated with presence of dyspnoea on presentation (38% vs 17%, p = 0.03) and an absence of chest pain (46% vs 16%, p = 0.003). Late gadolinium enhancement (LGE) was found in 71 patients (76%), but its presence was not associated with major adverse cardiac events (MACE) (p = ns). Of those who had LGE, 55% was mid-myocardial and 34% was epicardial. When indexed for body surface area (BSA), 41% and 24% of patients had an increased left ventricular end systolic volume (LVESV) and end diastolic volume (LVEDV) respectively. LVEF<50% on CMR was associated with MACE (HR 3.7, 95% CI 1.2-11.4, p = 0.03), while increased BSA indexed LVESV tended towards significance for MACE (HR 3.2, 95% CI 0.96-10.5, p = 0.06).

**Conclusion:** Reduced LVEF<50% and dilated LV volumes appear to be more significant than tissue enhancement patterns in predicting MACE in patients with myocarditis. Larger studies are warranted to investigate whether CMR findings can be combined with clinical factors to risk stratify myocarditis patients.

http://dx.doi.org/10.1016/j.hlc.2018.05.106
Is it Necessary to Fast Before Cardiac Catheterisation?
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Background: Patients are often kept nil by mouth before a cardiac catheterisation. However, there is no published evidence to support this practice. We aimed to measure current practice with regards to fasting at our centre and to quantify the rate of fasting-related complications.

Methods: A single-centre prospective observational study was conducted at Auckland City Hospital, New Zealand. Consecutive patients undergoing elective cardiac catheterisation (coronary angiography and angioplasty) were included and complications associated with procedural fasting recorded.

Results: A total of 1030 patients were included over 6 months. The mean age was 66 (SD 12) years, 67% were male, 26% had diabetes, 72% had hypertension, and 23% had stage 3 or worse chronic kidney disease. 11% were pre-hydrated with intravenous fluids. All patients were kept nil by mouth prior to the procedure. The mean length of fasting was 11.6 (SD 4.9) hours (Fig. 1). Table 1 describes fasting-related complications.

Conclusion: Within a single institution, there was wide variation in fasting practices related to cardiac catheterisation. In this real-world study, the duration of fasting was much longer than anticipated. Despite this, pre-hydration was used only in a minority of patients. Patient discomfort due to hunger and headache were common. There was a low rate of vomiting and no episodes of aspiration. Hunger was the most frequent complication. These data support the need for further research into the use of routine fasting prior to cardiac catheterisation.

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Table 1. Fasting-related Complications.

<table>
<thead>
<tr>
<th>Complication</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunger</td>
<td>485</td>
<td>47.1</td>
</tr>
<tr>
<td>Headache</td>
<td>120</td>
<td>11.7</td>
</tr>
<tr>
<td>Hypertension</td>
<td>62</td>
<td>6.0</td>
</tr>
<tr>
<td>Hypotension</td>
<td>42</td>
<td>4.1</td>
</tr>
<tr>
<td>Nausea</td>
<td>40</td>
<td>3.9</td>
</tr>
<tr>
<td>Anhydrosis</td>
<td>13</td>
<td>1.3</td>
</tr>
<tr>
<td>Hyperglycaemia</td>
<td>11</td>
<td>1.1</td>
</tr>
<tr>
<td>Vomiting</td>
<td>8</td>
<td>0.8</td>
</tr>
<tr>
<td>Vagovagal</td>
<td>8</td>
<td>0.8</td>
</tr>
<tr>
<td>Hypoglycaemia</td>
<td>7</td>
<td>0.7</td>
</tr>
<tr>
<td>Aspiration</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Figure 1. Length of Fasting (n = 1030)
A Nurse-Led Approach to the Management of Patients with Atrial Fibrillation - One Decade On

Jennie Dean1,2, Katherine Ferrier2
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Aim: To review current practice and application of guidelines one decade on from our first audit of a nurse-led Atrial Fibrillation (AF) clinic.

Method: A dedicated nurse-led clinic was set up in 2006 to address gaps between AF practice and guidelines. A 2007 audit demonstrated closing this gap. One decade on, updated guidelines were implemented. The clinic provides both medication and lifestyle management particularly around hypertension, obesity and stroke prevention.

Results: 100 new AF patient referrals were randomly selected from retrospective review. The findings were compared with our 2007 audit. Just under half (48%) of patients were under 65 years. 50% were referred with paroxysmal AF, up from 25% in 2007. More patients had undergone echo prior to their clinic review (86% vs 32% in 2007). Of 47% patients with a rate control strategy 37% required medication changes, similar to 2007. Hypertension was identified in 53% patients, compared to 62% in 2007. With greater evidence of the impact of obesity in AF patients we noticed 74% patients were overweight. 100% of patients had their stroke risk assessed and documented (CHA2DS2vasc score). 79% patients had appropriate oral anticoagulation management, with intervention required in 12% patients in 2017 in clinic, down from 30% of patients in 2007.

Conclusion: A nurse-led approach to managing AF continues to close the gap between practice and guidelines. We have found that obesity is a significant comorbid condition and we have demonstrated that there has been a large increase in the appropriate use of anticoagulants likely due to the introduction of dabigatran.

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Do Cardiac Rehabilitation Exercise Programmes in New Zealand Follow International Recommendations?

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Aim: Guidelines recommend that patients have access to individualized prescribed exercise program as part of cardiac rehabilitation (CR). An exercise prescription requires risk stratification, a baseline assessment of exercise capacity and a minimum of 16 hours of individualized program based on the patient clinical status. This snapshot describes exercise options at DHBs across New Zealand.

Method: A questionnaire was developed and sent to all CR Nurses at DHBs within New Zealand. The questionnaire assessed exercise options available to patients in phase 2 CR.

Results: 18 (95%) of DHBs responded to the survey. 2 non responders is a small DHB where nurse providers could not be found. 1 DHB offered no exercise options, 50% offered an individual and 52% group exercise programmes. 28% offered an ‘exercise prescription’ however only 1 DHB offered individualized exercise prescriptions with risk stratification as recommended by current guidelines. The number of hours of any exercise option offered was a median of 6 (5.75-16) hours.

Conclusion: This snapshot highlights the disparity of available CR exercise programmes across New Zealand. There is a lack of access to individualized exercise prescriptions as recommended by guidelines and understanding of exercise prescriptions is limited.

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Measured Implementation of an Accelerated Chest Pain Diagnostic Pathway in Primary Care

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2 Waikato Health District Board, Hamilton, New Zealand
3 Heart Foundation New Zealand, Auckland, New Zealand
4 Canterbury District Health Board, Christchurch, New Zealand
5 Otago University, Dunedin, New Zealand
6 Morrinsville Medical Centre, Morrinsville, New Zealand
7 Ministry of Health, Wellington, New Zealand
8 Auckland University, Auckland, New Zealand
9 Emergency Care Foundation, Christchurch, New Zealand

Aim: To assess the efficacy, safety and feasibility of implementing an Emergency Department Assessment of Chest Pain Accelerated Diagnostic Pathway (EDACS-ADP) using a current generation point-of-care cardiac troponin (POC cTn) assay for rule-out of acute myocardial infarction in patients presenting to rural General Practices in the Midland region of New Zealand with suspected cardiac chest pain.

Method: The EDACS-ADP was implemented and evaluated in twelve rural Midland general practices. The primary outcomes assessed were the number of patients identified as low risk managed without transfer to hospital following presentation and major adverse cardiac events (MACE).
Abstract

S5

Technician Affiliates Investigator Award Abstracts

O09
Remote Cardiac Rhythm Monitoring – Establishing Remote Cardiac Monitoring Criteria for Embolic Stroke Unknown
Source (ESUS) Patients at Auckland City Hospital
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Background: Remote Cardiac Rhythm Monitoring (CRM) is a service that has been provided to the wards at Auckland City Hospital by the Coronary Care Unit (CCU) since 2001. Since 2010 demand for this service has increased by an average of 12% each year. The Stroke Unit was established in ward 63 in December 2009 and referred all patients presenting with stroke for CRM monitoring. The criteria for requesting CRM monitoring were not clearly established. From 2010 to 2016 Ward 63 has been the highest single user of remote cardiac monitoring, averaging 17% of the total patient numbers. In 2016 a review of the patient data was undertaken in an attempt to rationalize the use of the CRM service.

Method: CCU has maintained a database of the CRM service since 2002. The 2015 data from ward 63 was analysed and patient’s identified to have had a stroke and Atrial Fibrillation (AF) were broken down into groups; known AF, AF on commencement of monitoring and patients who developed AF while on monitoring.

Results: Of 338 patients monitored from ward 63 with a stroke, 38 patients were noted to have AF. Of this group 22 were known to have AF, 31 were in AF on commencement of monitoring and 16 had a new detection of AF whilst on CRM. This data was presented to the Stroke service and it was established that patients who had AF on presentation did not require CRM monitoring. In collaboration with the Stroke service specific cardiac monitoring criteria was developed for ESUS patients. Patients requiring greater than 24hrs monitoring are referred for inpatient holter monitoring rather than CRM.

Conclusion: Review of the CRM data and establishment of stroke specific cardiac monitoring criteria has enabled us to potentially reduce the number of stroke patients using the CRM service by 10%.

http://dx.doi.org/10.1016/j.hlc.2018.05.111

O10
Waikato Hospital Experience of Magnetic Resonance Imaging for Patients with Non-MRI Conditional Pacemakers and Implantable Cardioverter Defibrillators
Christine Whiteley
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Aim: To share recent experiences of MRI at 1.5 Tesla without exclusion zones for patients with non-MRI conditional CIEDs using 2017 HRS guidelines.

Method: Non-MRI conditional devices were considered for MRI scanning using HRS guidelines and signed off by an Electrophysiologist and Radiologist. Fractured, redundant or epicardial leads were declined. A Radiologist and Cardiologist were on site. An external defibrillator with pacing function and a CIED programmer were available. Clinical Physiologists with ACLS training assessed devices and underlying rhythms prior to scans and programmed appropriate settings including deactivation of tachycardia therapies and inhibited modes (VVI/DDD) with advanced and adaptive features turned off. Physiologists monitored patients during scans with ECG and pulse oximeter. After scanning, devices were interrogated and programmed to original settings.

Results: Ten scans have been performed since 16/8/2017 in 8 patients: two of these have been repeat scans. Devices from all 4 NZ companies included: 1 S-ICD, 1 dual-chamber ICD, 1 CRT-D, 1 CRT-P and 3 DDD pacemakers. Scans included brain, spine and hips. No problems were seen during scans and interrogation of devices after scans showed all pacing values remained stable and no arrhythmias were detected.

Conclusion: Ten MRI 1.5 Tesla scans on patients with non-MRI conditional CIEDs have been performed. New HRS guidelines were followed and there have been no adverse effects observed.

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O11

Body Mass Index and Clinical Outcomes in Patients with Acute Coronary Syndrome

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3 Department of Medicine, University of Auckland, Auckland, New Zealand
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Background: The effect of body mass index (BMI) categories on clinical outcomes in patients with acute coronary syndrome (ACS) is unclear. Studies have suggested lower mortality in obese ACS subjects, the ‘obesity paradox’. The aim of this study was to investigate whether BMI category was associated with clinical outcome in ACS patients.

Methods: We performed an analysis of patients with ACS using data from the All New Zealand Acute Coronary Syndrome – Quality Improvement programme (ANZACS-QI). Cox proportional hazards regression was used to evaluate the influence of BMI category on all-cause mortality and cardiovascular disease (CVD) rehospitalisation post-discharge.

Results: There were 13,376 New Zealand residents who had their first completed confirmed ACS with angiography performed in ANZACS-QI during 1 July 2012 and 31 October 2015. Of these 9,949 (74.4%) patients had BMI data recorded. There was a U shaped relationship between BMI category and all-cause mortality (Table 1). Unadjusted data suggested mildly obese subjects (BMI, 30 to 34.9) had a lower mortality than normal (BMI, 18.5 to 24.9) and overweight subjects (BMI, 25 to 29.9). After adjustment for risk factors there was no difference in mortality between these three groups. Underweight (BMI, <18.5), moderately obese (BMI, 35 to 39.9) and morbidly obese subjects (BMI 40+) had higher mortality. There was no relationship between BMI and CVD rehospitalisation post-discharge.

Conclusion: Among patients presenting with ACS and undergoing coronary angiography, patients with very low or very high BMI had an increased risk of all-cause death. Mildly obese subjects did not have lower mortality.

http://dx.doi.org/10.1016/j.hlc.2018.05.113

O12

The Role of Stress as a Precipitating Factor in Spontaneous Coronary Artery Dissection

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Background: The diagnosis of spontaneous coronary artery dissection(SCAD) is increasingly being made, however, the pathophysiology is poorly understood. SCAD is frequently reported to occur at times of physical or emotional stress.

Methods: 68 patients diagnosed with SCAD, over a six-year period, were enrolled. We reviewed reported stress prior to SCAD. Emotional stress was assessed using Social-Readjustment Rating Scale(SRRS), a life events inventory with score >150units reflecting life disruption and >50% chance of stress induced event. A representative questionnaire from the INTERHEART study evaluated chronic stress.

Results: 49 patients, diagnosed with SCAD, participated(85.3%female). Mean age 53.3years(range 23-73years). 98.5% presented with acute coronary syndrome. 26.5% were smokers, 24.5% had hypertension and 4.1% had diabetes. 71.4% reported emotional stress, 20.4% reported physical stress and 6.1% following poly-pharmacy overdoses. Emotional stressors include relationship-breakdown(7.1%), witnessing major trauma(7.1%), bereavement(14.3%), personal/family

Table 1. Adjusted and unadjusted hazard ratio by BMI subcategory for all-cause mortality.

<table>
<thead>
<tr>
<th>BMI</th>
<th>Unadjusted</th>
<th>Adjusted for age and gender</th>
<th>Adjusted for multiple risk variables *</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18.5</td>
<td>5.27 (3.05–9.09)</td>
<td>3.48 (2.00–6.06)</td>
<td>1.85 (1.04–3.29)</td>
</tr>
<tr>
<td>18.5-24.9</td>
<td>1.68 (1.29–2.18)</td>
<td>1.29 (1.09–1.55)</td>
<td>1.17 (0.89–1.53)</td>
</tr>
<tr>
<td>25-29.9</td>
<td>1.30 (1.02–1.67)</td>
<td>1.12 (0.87–1.43)</td>
<td>1.15 (0.89–1.47)</td>
</tr>
<tr>
<td>30-34.9</td>
<td>Reference</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>35-39.9</td>
<td>1.34 (0.95–1.88)</td>
<td>1.58 (1.12–2.22)</td>
<td>1.42 (1.00–2.01)</td>
</tr>
<tr>
<td>40+</td>
<td>1.50 (1.00–2.24)</td>
<td>2.12 (1.42–3.19)</td>
<td>1.59 (1.04–2.43)</td>
</tr>
</tbody>
</table>

* Adjusted for age, gender, smoking, COPD, peptic ulcer disease, connective tissue disorder, liver disease, malignancy, dementia, cystolic blood pressure, serum creatinine, Killip score, cardiac arrest presentation, ST segment change, elevated cardiac enzymes, prior CVD, ACS type, history of CFI, PCI at index admission, in-patient CABG at index admission, medications prescribed at discharge (aspirin, second antiplatelet agent), statins, ACEI/ARB, Beta-blocker).
Abstract

illness (14.3%) and work stress (57.1%). 26.7% reported earthquake related stress. 28.6% with emotional stress scored >150 units on SRRS. Using INTERHEART questionnaire, 44% with emotional stress reported permanent stress and 40% reported major adverse life events.

60% of physical stressors occurred within 24 hours of SCAD, 30% after isometric activity and 70% after heightened aerobic activity. Recurrent SCAD occurred in 12% of which 66.6% described acute precipitating stress.

Conclusion: Our study identifies that acute emotional and physical stress is a common precipitating factor in patients presenting with SCAD. There may be a neuro-cardiology connection, similar to stress cardiomyopathy, which requires further investigation.

http://dx.doi.org/10.1016/j.hlc.2018.05.114

O13

Infective Endocarditis: A Retrospective Audit of Investigation and Management of at Risk Patients

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Aim: Determine adherence to local and international guidelines for the management of potential infective endocarditis in a secondary care setting.

Method: Database searches were performed for two sets of 100 consecutive patients; echocardiography requests for possible endocarditis and blood culture results positive for S. Aureus. Notes were reviewed to determine clinical details. Patients with inadequate data were excluded.

Results: 100 echocardiography requests for possible endocarditis were identified. No patients were excluded. Blood cultures were drawn prior to antibiotics in 77 patients. Echocardiography requests followed guidelines in 89 patients. All nine patients with no pre-echo Modified Duke criteria all had normal echocardiography. Endocarditis was diagnosed in 19 patients, two were culture negative. 95 patients were identified with blood cultures positive for S. Aureus. 23 patients were excluded. S. Aureus bacteremia was associated with a lower incidence of endocarditis than previously reported.

Conclusion: Echocardiography may be overutilized in low risk patients. S. Aureus bacteremia was associated with a lower incidence of endocarditis than previously reported. As echocardiography of high risk patients did not meet guideline recommendations this may indicate missed diagnoses. Cultures negative endocarditis had higher incidence than in previously published New Zealand data. This study is limited by its retrospective nature but increased adherence to guidelines may increase diagnosis of endocarditis and reduce culture negative results.

http://dx.doi.org/10.1016/j.hlc.2018.05.115

O14

A Propensity-Matched Nested Case-Control Study of Acute Coronary Syndrome Patients Genotyped for CYP2C19

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2 DNAture, Gisborne, New Zealand
3 Liggins Institute, University of Auckland, Auckland, New Zealand
4 Orion Healthcare, Auckland, New Zealand

Aim: Ticagrelor is widely considered superior to clopidogrel however a pharmacogenetic sub-study of PLATO indicated that the majority of this difference is due to genetic nonresponders to clopidogrel. We evaluated the outcomes following genotyping for CYP2C19 in a propensity matched ACS cohort treated with either clopidogrel or ticagrelor.

Method: 4,995 WDHB ACS patients were identified by ICD10 coding over a period of 5 years (2012-2016). Ticagrelor was subsidised by Pharmac in July 2013. Patients were genotyped for CYP2C19 *2, *3 and *17 alleles using either the Nanosphere Verigene analyser or Sequenom Massarray, and treatment tailored accordingly. Logistic regression and nearest neighbour propensity matching was employed in a 1:3:3 (genotyped:ticagrelor:clopidogrel) fashion to balance patient characteristics.

Results: 146 patients were genotyped and compared with 438 matched patients taking either clopidogrel, or ticagrelor. 93 (64%) genotyped patients were treated with clopidogrel. Post July 2013 71% responders versus 21% without genotype information were prescribed clopidogrel (X2 52, 95% CI 30 to 55, p < 0.0001). Personalised treatment was noninferior to ticagrelor HR 0.9, 95% CI: 0.4 to 2.1 and superior to clopidogrel HR 0.4, 95% CI: 0.18 to 0.98, p = 0.0002 with respect to all-cause mortality. Readmissions with ACS were higher in nonresponders treated with clopidogrel versus ticagrelor (HR 0.4, 95% CI: 0.13 to 0.98, p = 0.03) but equivalent between responders treated with clopidogrel versus ticagrelor HR 1.1, 95% CI: 0.5 to 2.9.

Conclusion: Personalised antiplatelet management was noninferior to ticagrelor with respect to all-cause mortality and ACS readmissions. It also led to an more appropriate utilisation of both clopidogrel and ticagrelor with resultant cost savings.

http://dx.doi.org/10.1016/j.hlc.2018.05.116
O15
Screening for Cardiac Disease with Genetic Risk Scoring, Advanced ECG, Echocardiography, Protein Biomarkers and Metabolomics
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3 University of Otago, Dunedin, New Zealand
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Aim: Screening patients for cardiovascular disease has not been widely advocated due to cost implications and is reserved for high risk or symptomatic patients. We undertook an exploratory study to evaluate the promising low-cost methods for screening, including genetic risk scoring (GRS), advanced ECG (A-ECG), echocardiography and metabolomics.

Method: 78 patients underwent advanced 5-min ECG and echocardiography, including global longitudinal strain (GLS), and echocardiographic calcium scoring (eCS). A GRS of 27 SNPs (GRS27) related to coronary disease and 3SNPs for atrial fibrillation was used, as well as hs-troponin (Abbott, Singulex, Roche), NT-BNP (Roche) testing and targeted plasma metabolomics using GC-MS. Results were correlated with the presence of coronary artery disease (CAD) (CT coronary angiography (CTCA)), measures of left ventricular hypertrophy (LVH) (echocardiography and CTCA), and LV systolic dysfunction (LVSD) (echocardiography).

Results: LV dysfunction was accurately identified by using either A-ECG (AUC 0.97, 95% CI 0.92 to 0.99) or NT-BNP (AUC 0.97, 95% CI 0.92 to 0.99) for LVSD, and eCS demonstrated accurate discrimination of CAD (AUC 0.84, 95% CI 0.72 to 0.92, p < 0.001). Troponin I (Abbott, Singulex) had the highest sensitivity and accuracy for the detection of LVSD measured by either CT or echocardiography (AUC 0.85, 95% CI 0.73 to 0.92), however specificity was reduced by the presence of LV systolic dysfunction. Metabolomics and A-ECG identified underlying abnormal mechanisms related to both LVH (glycine metabolism) and LV dysfunction, (Citric Acid cycle). Metabolomics provided incidental utility by identifying metformin adherence and nutritional biomarkers.

Conclusion: A multi-omic approach to screening can be achieved at relatively low cost, and high accuracy, but will need to be evaluated in larger populations to prove its utility.

http://dx.doi.org/10.1016/j.hlc.2018.05.117

O16
The Investigation and Treatment of Women who Present with Acute Chest Pain, Varies Little Compared with Men when Stratified by Risk
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2 University of Otago, New Zealand
3 Royal Brisbane and Women’s Hospital, Brisbane, Australia
4 Cardiovascular Research Institute, National University of Singapore, Singapore

Aim: Prior publications suggest that women with acute coronary syndromes are under investigated and treated compared with men.

Method: The investigation, treatment and outcomes in women and men recruited with acute chest pain were compared.

Results: Fewer women presented with acute chest pain (n = 931 v 1415). Women had less prior ischaemic heart disease (27% v 36%, p < 0.001), dyslipidaemia (49% v 56%, p < 0.001) or smoking (47.0% v 66.1%, p < 0.001) but more likely to have hypertension (58% v 51%, p = 0.001). Diabetes was no different (16% v 15%, p = 0.264). Women were more likely to be low risk (53% v 30%, p < 0.001). Women were just as likely to undergo stress testing (46% v 44%, p = 0.553) and for it to be positive (4.5% v 4.5%, p = 1.0). Women were less likely to undergo coronary angiography (23% v 30%, p < 0.001) or revascularisation (11% v 19%, p < 0.001). However, this was in part due to the disparity in risk. Those with low or intermediate risk had angiography (23% v 30%, p = 0.03) and for it to be positive (4.5% v 4.5%, p = 1.0). Women were less likely to undergo coronary angiography (23% v 30%, p < 0.001) or revascularisation (11% v 19%, p < 0.001). However, this was in part due to the disparity in risk. Those with low or intermediate risk had angiography (23% v 30%, p = 0.03) and for it to be positive (4.5% v 4.5%, p = 1.0). Women were more likely to be low risk (53% v 30%, p = 0.001). Women were just as likely to undergo stress testing (46% v 44%, p = 0.553) and for it to be positive (4.5% v 4.5%, p = 1.0). Women were less likely to undergo coronary angiography (23% v 30%, p < 0.001) or revascularisation (11% v 19%, p < 0.001) and those with severe disease were as likely to be revascularized (82.2% v 78.6). Adverse cardiac event rates at 1 year were similar.

Conclusion: There is little disparity between the investigation, treatment and outcomes in women and men presenting with acute chest pain when stratified by risk.

http://dx.doi.org/10.1016/j.hlc.2018.05.118
Abstract

confirming LV function assessment during acute coronary syndrome (ACS)

Admission at BOPDHB Hospitals

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Aim: The LV Assessment Report by ANZACS-QI in 2017 indicated only 74.8% of Bay of Plenty (BOP) acute coronary syndrome (ACS) presentations had left ventricular ejection fraction (LVEF) measured during admission. This audit was performed to check the validity of the ANZACS-QI report and also ascertain the reasons for no LVEF assessment.

Method: ANZACS-QI identified 295 BOP admissions between January 2016 and June 2017 as ACS presentations and in 50 admissions it was deemed LVEF would not alter management. LVEF was not assessed in 181 (61.4%). In 33 admissions the reason was either recent inpatient or outpatient LVEF measurement and in 50 admissions it was deemed LVEF would not alter management.

Conclusion: In the BOP ACS population, ANZACS-QI did not capture over one third of the LVEF assessments performed which appeared to be largely related to patients being transferred to another DHB and electronic record uploading delay. There is also a significant subgroup of patients where the treating clinicians, as stewards of the healthcare resource, omitted LVEF assessment as it would not alter clinical management. We recommend this audit should be extended to other DHBs in the country to determine the true rate of assessment and factored into future ANZACS-QI reports.

http://dx.doi.org/10.1016/j.hlc.2018.05.119

O18

Outcomes in Working Age First-Acute Coronary Syndrome Patients: The ANZACS-QI New Zealand National Cohort

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Aim: To describe the outcomes following admission for first-acute coronary syndrome (ACS) for a contemporary New Zealand (NZ) patient group, with a focus on working-age people and the subsequent burden of disease.

Method: The All NZ acute Coronary Syndrome Quality Improvement programme (ANZACS-QI) registry collects data for patients admitted with ACS at NZ public hospitals. This analysis includes patients with confirmed first-time ACS from 01/01/2012–31/12/2016. Outcomes include (a) all-cause mortality, (b) cardiovascular (CV) readmissions, and a combined endpoint (a) + (b), with a median follow-up time of 1.2 years.

Results: 1422 patients had first-ACS, 68% male, mean age 63 years. Compared to older patients, those of working age (aged <65 years, 54% of cohort) had a higher burden of CV risk factors. Overall, 19% of the patients died or had a CV readmission within 12 months; the proportion increased with increasing age. In patients aged <65 years, 15% died or had a CV readmission within 12 months of their first-ACS. In these younger patients, those who experienced death or readmission had a higher risk factor burden, with 22% having ≥3 of current smoking, diabetes, BMI≥30, or total cholesterol:HDL ratios ≥4.0 compared with 18% of those without subsequent event(p=0.003).

Conclusion: Over half of the patients with first-ACS were aged <65 years, and one in six died or had a CV readmission within 12 months. While at relatively lower risk than older patients, the high proportion of patients aged <65 years experiencing subsequent events after first-ACS confers a heavy burden of disease during what are potentially productive working years.

http://dx.doi.org/10.1016/j.hlc.2018.05.120

O19

Management of Acute Coronary Syndrome (ACS) in the Elderly

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Background: Patients over 80 are at high risk for complications of ACS and its treatment. We investigated differences in management of elderly patients (≥80) with ACS depending on treatment strategy and when compared to younger patients (<80).

Methods: Data from 1873 patients with confirmed ACS presenting to Tauranga or Whakatane Hospitals between Jan 2012 – Dec 2016 were collected using ANZACS-QI (All New Zealand Acute Coronary Syndrome – Quality Improvement) database. Outcomes were compared between elderly and younger patients. Outcomes depending on invasive or non-invasive management were compared in the elderly.

Results: There were 599 patients in the elderly group compared to 1274 in the younger group. 44.0% of patients received invasive management in the elderly group vs 88.77% in the younger group. Adverse outcome rates were higher in the elderly: 30 day mortality 7.0% vs 1.88%, 1 year mortality 16.36% vs 4.47%, recurrent ACS with a year 18.39% vs 5.25% and bleed within a year 4.84% vs 2.82% respectively. The sub-group analysis (in the elderly) showed significantly lower complication rates in the invasive group in comparison to non-invasive group: 30 day mortality 1.13% vs 11.64%, 1 year mortality 4.16% vs 25.97%, recurrent ACS within a year 9.09% vs 25.37% and bleed within a year 2.68% vs 6.56% respectively. All results achieved statistical significance.
Conclusion: Overall, elderly patients were significantly less likely to receive invasive management and were more likely to experience adverse outcomes compared to younger patients. Elderly patients who received invasive management were less likely to develop these complications.

http://dx.doi.org/10.1016/j.hlc.2018.05.121

O20

Instantaneous Wave-Free Ratio Guided Management of Coronary Lesions - A Single Centre Experience

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Background: Instantaneous wave-free ratio (iFR) has been established as non-inferior to FFR in physiological assessment of intermediate severity coronary artery stenosis. We observed clinical outcomes for patients who had iFR guided management of such lesions.

Method: We enrolled consecutive patients who had coronary lesions of uncertain severity assessed by iFR over an 8 month period. Indications for angiography and iFR were recorded. Clinical outcomes measured were: recurrent angina, acute coronary syndrome (ACS), revascularisation.

Results: 115 patients (169 lesions) were assessed. Mean age 63 (range 40-83,75% male). Median follow up was 158 days. Indications for angiography included stable angina 34%, ACS 60%, diagnostic/surgical workup 6%. Lesions assessed were in LAD in 60%, circumflex 17%, RCA 20% and left main 3%. 46 patients (55 lesions) required revascularisation based on iFR physiology. Median iFR (IQR) 0.78(0.75-0.88). 36 underwent percutaneous intervention (PCI). 10 had coronary artery bypass grafting. Revascularised lesions were in the LAD in 75%, circumflex 13%, RCA 9% and left main 4%. At follow up, 11% reported angina. 7% had ACS, 4% required further revascularisation.

Conclusion: In this single centre experience, iFR appears to be reliable method of assessing the need for revascularisation in angiographically intermediate severity coronary lesions over a medium term follow up period.

http://dx.doi.org/10.1016/j.hlc.2018.05.122

O21

Impact of Outcome Measure and Duration of Follow-up on the Reliability of Clinical Trials Assessing the Efficacy and Safety of Coronary Artery Stents

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Aim: Advances in coronary stent design have reduced rates of coronary restenosis and the need for further revascularisation. However, compared with second-generation (2ndGen) drug-eluting stents (DES), first-generation (1stGen) DES and biodegradable coronary scaffolds (BVS) have an increased risk of stent thrombosis which may not be adequately assessed in individual studies. A meta-analysis was undertaken to evaluate the best choice of endpoint and follow-up duration to detect any increased risk of stent or scaffold thrombosis (ST).

Methods: Medline, Embase and Central were searched for randomised coronary stent trials involving ≥100 patients and reporting clinical outcomes for ≥12 months. Meta-analyses compared 1stGenDES with bare metal stents (BMS), 2ndGenDES with BMS, 2ndGenDES with 1stGenDES, 2ndGenDES with BVS. Landmark analysis evaluated clinical outcomes ≤1 year and >1 year.

Results: 75 trials were analysed involving 78,491 patients. Compared with BMS, 1stGenDES decreased restenosis [OR0.36 (95% CI 0.25, 0.53)], myocardial infarction [MI] [OR0.65 (95% CI 0.52, 0.82)] ≤1 year, but increased ST [OR1.66 (95% CI 1.21, 2.99)] and MI [OR1.41 (95% CI 1.07, 1.87)] >1 year. 2ndGenDES vs BMS decreased restenosis [OR0.51 (95% CI 0.44, 0.58)], MI [OR0.70 (95% CI 0.58, 0.85)], and ST [OR0.48 (95% CI 0.31, 0.72)], ≤1 year with little impact on other and later end-points. Compared with 1stGenDES and BVS, 2ndGenDES reduced ST and MI ≤1 year. Coronary revascularisation, and composite endpoints including death and revascularisation, did not reliably identify ST-related risk.

Conclusion: Revascularisation rates ≤12 months can evaluate the efficacy of stents on reducing restenosis. Long-term safety can only be assessed in large study populations followed for several years, with the best endpoint a combination of MI and ST. A two-phased approach is required to evaluate the next generation of coronary stents and scaffolds.

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Abstract

**O22**

Angiographic Characteristics of Spontaneous Coronary Artery Dissection

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**Background:** Spontaneous Coronary Artery Dissection (SCAD) is an uncommon presentation of ACS, more often seen in younger females. Awareness of the angiographic appearance will enable wider recognition.

**Methods:** We reviewed all patients discharged since August 2011 with diagnosis of SCAD. 82 cases were identified. Independent review by two interventional cardiologists (SCAD) is an uncommon presentation of ACS, more often seen in younger females. Awareness of the angiographic appearance will enable wider recognition.

**Results:** Patients were predominantly female (87%), mean age 54yrs. SCAD was most common in the LAD (42%), of which 71% were in the distal LAD. The majority (72%) appeared either in the distal third of a major artery or in a branch vessel. Mean culprit vessel diameter was 2.36mm. Type 1 SCAD (dual-lumen staining) appeared in 18%, type 2 (abrupt, diffuse luminal narrowing) 66%, type 3 9% and the recently described type 4 SCAD in 7%. Tortuous coronaries were seen in 78% of females but only 44% of males. Multi-vessel symmetry and corkscrew patterns appeared in 17% and 13%. SCAD involved a hinge point in 55%, and bifurcation 36%. PCI failure rates were high. Awareness of the angiographic features will allow greater appreciation of this important diagnosis of SCAD.

**Conclusion:** The commonest location of SCAD was the distal LAD, with most occurring in small vessels. Type 2 SCAD appeared in the majority of patients. Tortuosity was common and lesions frequently involved hinge points or bifurcations. PCI failure rates were high. Awareness of the angiographic features will allow greater appreciation of this important cause of ACS.

http://dx.doi.org/10.1016/j.hlc.2018.05.124

**O23**

Reperfusion Practice for ST Elevation Myocardial Infarction (STEMI) in New Zealand: Observations from ANZACS-QI

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Waikato Hospital, Hamilton, New Zealand

**Aim:** To describe the management and hospital outcome of patients from and with STEMI to non-primary PCI (npPCI) centres compared to primary PCI (pPCI) centres.

**Method:** STEMI patients enrolled in ANZACS-QI from 1/1/15 to 31/12/15.

**Results:** 1715 patients from the Cath-PCI registry all of whom underwent angiography were included. Presentations to npPCI centres were older (69yrs vs 62yrs P < 0.001) and more likely to be Maori (14% vs 9% P < 0.001). Two-thirds (1100/1715) presented to a pPCI centre with 79% (865/1110) undergoing PCI. A median time from symptom onset to device of 178 mins (IQR 134 – 257) was noted when arriving by ambulance (AbA) vs 196 mins (IQR 130 – 310) in self-presenters (SP). In npPCI centres, 66% (405/615) received fibrinolysis. A median time from symptom onset to handle (mtsOTN) of 136 mins (IQR 95 – 220) was noted in AbA vs 11min (IQR 66 – 215) in SP. Pre-hospital fibrinolysis was commenced in 1 in 10 with mtsOTN reduced to 69 mins (IQR 46 – 101). Rescue PCI was performed in 1 in 3 (350/1115) STEMI patients, received no reperfusion therapy. In hospital mortality was low (3.5% vs 4%) in both groups. Length of stay was longer in npPCI (median 4 vs 3 days).

**Conclusion:** One in five presenting with STEMI are not reperfused. Strategies to improve both reperfusion rates and reduce delays in time should continue to be explored in both npPCI and pPCI centres particularly in patients who may require rescue PCI.

http://dx.doi.org/10.1016/j.hlc.2018.05.125

**O24**

Comparison of Octogenarians and Septuagenarians Undergoing Coronary Artery Bypass Surgery

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**Aims:** Coronary artery bypass grafting (CABG) is the recommended treatment for severe three-vessel or left main with complex coronary artery disease. As the population ages, a greater proportion of CABG patients are elderly, but their outcomes are not well established. We reviewed the results of elderly patients over 70 years old undergoing CABG at our centre.

**Methods:** Elderly patients undergoing isolated CABG at Auckland City Hospital during July 2010-June 2012 were divided into septuagenarian 70-79 years old and octogenarian 80+ years old groups, comparing their characteristics and outcomes.

**Results:** There were 45 octogenarians and 219 septuagenarians studied, mean age 82.3 vs 74.4 years P < 0.001. Octogenarians had lower weight 73.2 vs 78.0kg P = 0.033, prevalence of Maori or Pacific ethnicity 2.2 vs 16.4% P = 0.009, and creatinine clearance 54 vs 68mL/min P = 0.003 respectively. They also had higher HTS Score 8.2% vs 5.6% P < 0.001 but similar EuroSCORE II P = 0.607. Despite this, there were no differences in operative (2.2 vs 2.3%, P = 1.00) and medium-term mortality (1-year survival 97.8% vs 96.7%, P = 0.633) and post-operative complications (all P > 0.30). In multivariable analyses, Maori or Pacific ethnicity was independently asso-
Abstract

Associated with higher operative and long-term mortality, while impaired ejection fraction <50% predicted composite morbidity (P < 0.05). Both risk scores did not predict operative mortality (c-statistic 0.49–0.50).

Conclusion: CABG remains a safe procedure in selected elderly patients, and age alone should not exclude patients from cardiac surgery. Conventional risk scores had poor prognostic utility, so other parameters such as frailty should be accounted for in decision-making for intervention.

http://dx.doi.org/10.1016/j.hlc.2018.05.126

Electrophysiology

O25

Electrophysiology Studies in New Zealand: A 3 year Analysis of Case Type and Volume Across New Zealand on Behalf of Heart Rhythm New Zealand (HRNZ)

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2 Tauranga Hospital, Tauranga, New Zealand
3 Heart Rhythm New Zealand, New Zealand

Background: The field of electrophysiology (EP) has evolved dramatically over the past 2 decades. The EP service has had to expand accordingly to accommodate its increasingly crucial role in cardiovascular medicine. We aimed to provide a contemporary snapshot of the EP service across New Zealand.

Method: EP case type and volume were collected from each of the 4 public and 4 private EP centres in New Zealand from 2014 to 2016 by Heart Rhythm New Zealand. Paediatric EP cases were performed in Auckland.

Results: A total of 4322 cases were performed. The total number of cases per annum increased by 23% during this period, with an increase in the number EP physicians from 12 to 17. Pulmonary vein isolation (PVI) was the most common EP case at 26%, followed by atrioventricular nodal reentrant tachycardia (AVNRT) at 20%, atrial flutter (AFL) at 19% and accessory pathway (AP) at 12%. These 4 types of cases accounted for >72% of cases in each centre.

Public centres performed 80% of cases. By region, Northern accounted for 39%, Midlands 26%, Central 16% and Southern 19%.

Conclusion: This analysis provides contemporary data on the EP service across NZ.

http://dx.doi.org/10.1016/j.hlc.2018.05.127

O26

Implantable Cardioverter Defibrillator (ICD) Use in New Zealand: A 3 Year Analysis from the All New Zealand Acute Coronary Syndrome- Quality Improvement Device Registry (ANZACS-QI DEVICE)

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2 Waikato Hospital, Hamilton, New Zealand
3 Wellington Hospital, Wellington, New Zealand
4 Auckland City Hospital, Auckland, New Zealand
5 Tauranga Hospital, Tauranga, New Zealand

Aim: The ANZACS-QI DEVICE registry, introduced to NZ public hospitals in 2014, was collaboratively developed by Heart Rhythm New Zealand and Counties Manukau DHB. This study utilises the registry to report contemporary NZ ICD implant practice.

Method: Completed records of ICD implants from the ANZACS-QI DEVICE registry between 1st July 2014 to 30th June 2017 were analysed.

Results: 1362 ICD implant entries were completed, with 995 (73%) new implants.

Primary prevention (n = 490)  Secondary prevention (n = 505)

<table>
<thead>
<tr>
<th>Median Age (IQR)</th>
<th>62 (54-68)</th>
<th>62 (53-70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male gender</td>
<td>81.0%</td>
<td>80.6%</td>
</tr>
<tr>
<td>BMI, mean ± SD</td>
<td>30.2 ± 6.5</td>
<td>29.5 ± 6.4</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
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<tr>
<td>European</td>
<td>63.9%</td>
<td>65.1%</td>
</tr>
<tr>
<td>Māori</td>
<td>24.5%</td>
<td>21.4%</td>
</tr>
<tr>
<td>Other</td>
<td>11.6%</td>
<td>13.5%</td>
</tr>
<tr>
<td>History of heart failure</td>
<td>80.6%</td>
<td>40.4%</td>
</tr>
<tr>
<td>NYHA Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>17.2%</td>
<td>35.3%</td>
</tr>
<tr>
<td>II</td>
<td>55.7%</td>
<td>37.8%</td>
</tr>
<tr>
<td>III</td>
<td>21.8%</td>
<td>11.3%</td>
</tr>
<tr>
<td>IV</td>
<td>0.8%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Mean LVEF (%)</td>
<td>25.1 ± 6.7</td>
<td>30.1 ± 9.2</td>
</tr>
<tr>
<td>Aetiology</td>
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<tr>
<td>Ischaemic</td>
<td>42.5%</td>
<td>56.4%</td>
</tr>
<tr>
<td>Non-ischaemic</td>
<td>57.5%</td>
<td>43.6%</td>
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<tr>
<td>ECG at implant</td>
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</table>

http://dx.doi.org/10.1016/j.hlc.2018.05.127
Abstract

<table>
<thead>
<tr>
<th></th>
<th>Primary prevention (n = 490)</th>
<th>Secondary prevention (n = 505)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinus rhythm</td>
<td>74.7%</td>
<td>80.6%</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>18.4%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Mean QRS duration</td>
<td>129.4 ± 36.5</td>
<td>113.6 ± 31.6</td>
</tr>
<tr>
<td>Bundle branch block</td>
<td>42.2%</td>
<td>25.3%</td>
</tr>
<tr>
<td>LBBB</td>
<td>75.9%</td>
<td>61.7%</td>
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<tr>
<td>Indication</td>
<td></td>
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<tr>
<td>VT/VF Cardiac Arrest</td>
<td></td>
<td>63.2%</td>
</tr>
<tr>
<td>Sustained VT</td>
<td></td>
<td>25.7%</td>
</tr>
<tr>
<td>Non sustained VT</td>
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<td>9.5%</td>
</tr>
<tr>
<td>Syncope</td>
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<td>8.3%</td>
</tr>
<tr>
<td>Device Type</td>
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<tr>
<td>Single</td>
<td>50.4%</td>
<td>61.2%</td>
</tr>
<tr>
<td>Dual</td>
<td>19.2%</td>
<td>27.1%</td>
</tr>
<tr>
<td>CRT-D</td>
<td>26.9%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Subcutaneous</td>
<td>3.5%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Implant region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern</td>
<td>43.3%</td>
<td>45.5%</td>
</tr>
<tr>
<td>Midlands</td>
<td>35.9%</td>
<td>28.7%</td>
</tr>
<tr>
<td>Central</td>
<td>12.0%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Southern</td>
<td>8.8%</td>
<td>13.3%</td>
</tr>
</tbody>
</table>

Of the 367 replacements, 71.4% were for end of battery life and 10.4% were for a system upgrade. 46.0% had delivered appropriate therapy whilst 18.3% had delivered inappropriate therapy. Mean number of shocks was 3.67 ± 8.14.

Conclusion: This analysis provides contemporary data of ICD implantation practice across New Zealand.

http://dx.doi.org/10.1016/j.hlc.2018.05.128

O27

Prevalence of Depression and Anxiety Among Patients with Cardiac Implantable Electronic Device (CIED)

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Aim: Previous studies have suggested an increased level of anxiety and depression in patients with CIEDs, particularly those with Implantable Cardioverter Defibrillators (ICD). This study aims to ascertain the prevalence of depression and anxiety symptoms among patients with CIEDs.

Method: Patients attending pacemaker clinic at Waikato and Auckland Hospitals between April and July 2017 provided demographic data and completed Pacemaker-Specific and Hospital Anxiety and Depression Score (HADS) questionnaires.

Results: Of 111 patients (mean age 69.5 ± 15.7y, 64 male, 30 ICD), mean HADS scores for depression and anxiety were 3.06 (ICD 3.67, Pacemaker 2.44) and 3.71 (ICD 4.17, Pacemaker 3.25), respectively. Overall rates of potential clinical diagnoses for depression and anxiety were 19.8% (ICD 26.7% Pacemaker 17.3%) and 36% (ICD=40%, Pacemaker=34.6%), respectively. Despite higher rates of self-reported depression and anxiety, 85% of patients believed having a CIED was worthwhile. Subset analysis found no statistically significant difference between the ICD and pacemaker groups (Depression p=0.313, Anxiety p=0.692). Anxiety and depression scores were not affected by gender or ethnicity (p>0.05) but increasing age was associated with lower scores (p=0.03).
Conclusion: There is no significant difference in the prevalence of depression and anxiety between different CIED device types. However, based on the HADS screening tool, the prevalence of potential mental illness, especially anxiety, is higher than expected within these populations compared to the matched general population. Increasing age may also be a protective factor.

http://dx.doi.org/10.1016/j.hlc.2018.05.129

O28 Atrial Fibrillation - A Midlands Wide Audit, How Badly Are We Doing?
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2 Waikato District Health Board, Hamilton, New Zealand
3 Auckland District Health Board, Auckland, New Zealand

Aim: To assess the prevalence, diagnostic rates for Atrial Fibrillation, Embolic Stroke in the Midland region 2011-2015 inclusive, snapshot of anticoagulation in one DHB.

Method: All in patient admissions from the Data set: Midland DHB hospital register Costpro
DHBs included: Waikato, Bay of Plenty, Lakes, Taranaki and Tairedwhi
Diagnosis: Atrial Fibrillation, ICD10 I50, primary diagnosis
Time period: 2011-2015
Excluded: Readmissions within 1 day (treated as a transfer), residents from outside Midland DHB or patients were the address could not be geocoded. Assessment of rhythm was also audited. Detailed drill down of anticoagulation done for one DHB.

Results: Assessment of AF was poorly done, probably grossly underestimated, Embolic CVA as high as 38% (higher than other studies). Less than 25% of patients with AF were appropriately anticoagulated. Presentation/admission rates with AF was inversely related to distance to nearest health centres.

Conclusion: AF is neither reliably sought for nor documented, anticoagulation options need to be broadened, rates of embolic strokes are likely inaccurate, poorer rural patients are underserved – answer to the title question – very badly.

http://dx.doi.org/10.1016/j.hlc.2018.05.130

O29 Permanent Pacemaker Implantation After Cardiac Surgery: Rates, Predictors and a Novel Risk Score
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2 University of Auckland, Auckland, New Zealand

Aims: Cardiac surgery causes bradyarrhythmia in a minority of patients and some of these persist to needing permanent pacemaker (PPM) implantation. We review the incidence, characteristics and predictors of PPM implantation after cardiac surgery at our centre.

Methods: Consecutive patients undergoing cardiac surgery June 2014-October 2016 at Auckland City Hospital who received PPM post-operatively during the same admission were retrospectively reviewed, and compared to a random sample of the same number of controls without PPM to identify predictors and construct a risk score.

Results: There were 98 (4.0%) PPM implantations after 2,446 cardiac surgeries during the study period. PPM incidence was 0.6% (7/1165) for coronary surgery, 7.1% (45/636) for single valve ± coronary surgery, 9.0% (12/133) for double valve ± coronary surgery and 7.0% (34/489) for other cardiac surgeries. Multivariable analysis identified pre-operative heart block and type of cardiac surgery to independently predict PPM implantation, from which a simple additive risk score out of 7 was developed: pre-operative ECG normal = 0, arrhythmia = 1, presence of conduction disease = 2, high-grade block = 3; and isolated coronary = 0, single valve or other = 2, double valve = 4. The score performed well in our cohort with c-statistic 0.78 (95% confidence interval 0.72-0.85). PPM implantation was associated with longer operation and ventilation time and hospital stay (P < 0.003), but not mortality.

Conclusion: A significant minority of cardiac surgery patients require PPM implantation after cardiac surgery, with pre-operative ECG and type of cardiac surgery being the most important predictors. A risk model of PPM implantation was developed based on these two key parameters.

http://dx.doi.org/10.1016/j.hlc.2018.05.131
Heart Failure  O30
Mid-range Ejection Fraction Following Acute Coronary Syndrome: Incidence, Management and Outcomes (ANZACS-QI)
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Background: Pharmacological management algorithms following acute coronary syndrome (ACS) have typically dichotomised left ventricular ejection fraction (LVEF) into < or ≥ 40%. However, recent heart failure guidelines propose three categories; reduced EF(EF<40%), mid-range EF(mrEF/40-49%) and preserved EF(EF ≥50%).

Aims: To describe the incidence, management and outcomes in mrEF post-ACS.

Method: Consecutive patients with ACS who underwent coronary angiography during 2015 were registered in the ANZACS-QI (All New Zealand ACS - Quality Improvement) registry. Outcomes and one-year dispensing data were obtained using anonymised linkage to national data sets, and Cox proportional hazard modelling was applied.

Results: Of 6216 ACS patients, 43.5% had pEF, 14.4% mrEF and 11.1% rEF. 31.4% had no LVEF assessment.

Mid-range EF and rEF were associated with higher risk-adjusted all-cause mortality over 1.5 years of follow up compared to pEF (HR 2.2 [95%CI 1.60-3.05] and HR 4.0 [95%CI 2.99-5.30] respectively). Mid-range EF and rEF were also associated with higher risk-adjusted subsequent HF hospitalisation (HR 1.5 [95%CI 1.10-2.09] and HR 3.9 [95%CI 3.00-5.05]).

At discharge, prescription of ACEI/ARB was lowest in pEF(69%), intermediate in mrEF(78%) and highest in rEF(84%/p < 0.01 all comparisons). Discharge prescription of beta-blockers was lower for pEF than mrEF or rEF patients (82, 89 and 89%, respectively (p < 0.001).

In one-year survivors, 18.7%, 21.5% and 34.8% of pEF, mrEF and rEF patients were dispensed ≥50% of target doses of beta-blockers (p < 0.001).

Conclusion: Mid-range EF post-ACS is associated with a higher risk of morbidity and mortality compared to those with pEF suggesting that more intensive medical management may be appropriate.

http://dx.doi.org/10.1016/j.hlc.2018.05.132

O31
Heart Failure Readmission Can Be Reduced by Heart Function Service
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Aim: Evaluate the readmission rate since integration of Clinical Nurse Specialist (CNS) into Heart Function Service at Nelson Marlborough District Health Board (NMDHB).

Method: A retrospective audit undertaken of NMDHB discharges with a primary diagnosis of heart failure in financial years 2013/14-2016/17. With evaluation of readmission rates at 30 and 90 day periods.

Results: Heart Failure admissions within NMDHB have continued to increase over the past three financial years with the greatest growth in Nelson Hospital.

Overall heart failure admissions increased from 193 in 2013/14 to 232 in 2016/17, with Nelson hospital experiencing the greatest increase over this timeframe, from 11 to 175 inpatients. Overall readmissions have decreased in the past year (2016/17) from 35 to 21, with both 30 day (11) and 90 day (10) readmission numbers decreasing correspondently.

Conclusion: The role of CNS Heart Function was developed to advance client centered care, interdisciplinary education, and seamless transition of patients from secondary into primary care. Including early medication titration and reconciliation with early professional support of complex patients, focusing on the aim of supporting patients in primary care. Despite increases in first admissions, readmission rates have decreased significantly in the past year, enabling financial savings for NMDHB based upon Case Weights to the Value of $72,422.70.

http://dx.doi.org/10.1016/j.hlc.2018.05.133

O32
Salbutamol Prescribing in Primary Care May Represent Undiagnosed Heart Failure
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2 Best Practice Advocacy Centre, Dunedin, New Zealand

Aim: Salbutamol, a beta-2 agonist inhaler, is commonly prescribed in primary health care for adults with dyspnoea, wheeze and cough thought to be due to respiratory causes, but the diagnosis may be uncertain. Salbutamol prescription may indicate an increased risk of hospital admission for new heart failure (HF)

Method: From a cohort of ~5 million primary care patients, HF cases were defined as any patient with a first hospital admission for HF between 2008 and 2014. Control patients with no diagnosis of HF were matched 1:4 based on age, gender and timing of the primary care encounter. The index date was the date of hospital admission for HF cases and their matched controls. The National Pharmaceutical Collection identified all medications prescribed ≥90 days, and new medications prescribed ≤30 days prior to the index date. Odds Ratios (OR) for risk of HF were calculated for salbutamol prescription for all HF cases compared to controls, and stratified by comorbidities. Logistic regression was used to calculate ORs adjusted for comorbidities.

Results:
**Abstract**

**HF Cases** | **Controls** | **OR** | **Adjusted OR**
---|---|---|---
Salbutamol dispensed ≤90 days | 9,538 (15.3%) | 13,160 (4.8%) | 3.6 (3.5-3.7) | 2.5 (2.4-2.6)

Risk-associated with salbutamol use over prior 90 days and comorbidity

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cases</th>
<th>Controls</th>
<th>OR (95% CI)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial fibrillation</td>
<td>1,079 (1.7%)</td>
<td>461 (0.2%)</td>
<td>10.6 (9.5-11.8)</td>
<td>4.0 (3.5-4.5)</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>915 (1.5%)</td>
<td>460 (0.2%)</td>
<td>9.0 (8.0-10.0)</td>
<td>2.9 (2.6-3.3)</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>970 (1.6%)</td>
<td>499 (0.2%)</td>
<td>8.8 (7.9-9.8)</td>
<td>2.8 (2.5-3.2)</td>
</tr>
</tbody>
</table>

New prescription for salbutamol ≤30 days | 1,393 (2.2%) | 931 (0.3%) | 6.8 (6.2-7.4) | 6.0 (5.5-6.6) |

* P < 0.001 for all.

**Conclusion:** Salbutamol prescription in primary care was associated with an increased risk of hospital admission for HF, particularly following a new prescription.

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**O33 The Variants of Takotsubo Syndrome Differ in More Ways Than Just the Echo Pattern**

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2 Molecular Pathology Laboratory, Canterbury District Health Board, Christchurch, New Zealand
3 University of Otago, Christchurch, New Zealand

**Background:** The incidence of takotsubo cardiomyopathy is increasing and cardiologists now recognise that there are variants within the syndrome. Careful characterisation of the subtypes and their clinical behaviour will be a step towards an improved understanding of this enigmatic condition.

**Method:** We used our prospectively acquired cohort to establish whether there were any differences between patients presenting with classic and the variant forms of the syndrome, comparing markers of severity and their time-course. Each echo was over-read by a specialist echocardiologist blinded to the clinical report.

**Results:** 224 patients were included in the study (98% female). Patients with the classic form of the syndrome were older (p = 0.011), had a lower initial LVEF (33% vs. 44%, p < 0.001), and a higher peak hsTnI (p = 0.01) than those with variant forms. Despite these marked differences, there was no difference in the electrical abnormalities between the variants. There was no correlation between echo pattern and QTc interval. There was also no correlation between peak hsTnI and peak QTc. (Kendal Tau correlation coefficient = -0.02). QTc intervals increased on day two and peaked on day three (p < 0.001). There was no difference in QTc time course between the classic and variant forms of the syndrome.

**Conclusion:** Classic takotsubo patients differ from those with variants in more ways than just their echo pattern but not in their electrical abnormalities. There is a dissociation between the structural and electrical abnormalities. They have different time courses and our data shows that they are not related in severity.

http://dx.doi.org/10.1016/j.hlc.2018.05.135

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**O34 Imaging**

**Does Cardiologist Co-reporting of Near-Normal Transthoracic Echocardiograms Impact on Patient Management at a Tertiary Centre?**

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**Background:** Transthoracic echocardiography (TTE) remains one of the most commonly ordered tests in cardiology. To prioritise reporting, Waikato hospital has a system whereby near-normal studies are assigned “P3”, those with moderate pathology “P2” and studies with severe abnormalities “P1”.

**Aim:** to prospectively determine whether cardiologist co-reporting of P3 TTE impacts on the management of patients. A secondary aim was to determine whether the initial priority given to the study was appropriate.

**Methods:** On consecutive P3 echocardiograms, we compared the initial sonographer report with that of the co-reporting cardiologist, noting whether a change was made. Changes were separated in a binary fashion: a “major” change was defined as one altering management/follow-up; whereas
Abstract

S17

a “minor” change was an alteration not impacting on clinical care. Qualitative data around the reason for the scan was also collected. Finally, a judgement was made by the reporting cardiologist around the appropriateness of the initial priority given by the sonographer.

Initial results: So far 37 TTE reports have been evaluated with 70% (26/37) reports initially assessed as P3. Changes were made to 33 (89%) of reports, however, in only 10% were there major changes that impacted on clinical care/follow-up, of which 3 were in inappropriately prioritised TTE.

Conclusion: This prospective study suggests that in a small but significant minority of reports there was a change that altered management and the initial priority given to the report was inappropriate. It appears from our initial results that cardiologist co-reporting continues to add some value, even in TTE deemed near-normal.

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Structural and Valve Disease

O35

Inpatient TAVI During Acute Hospital Admission with Symptomatic Severe Aortic Stenosis

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3 University of Otago, Christchurch School of Medicine, Christchurch, New Zealand

Background: Most transcatheter aortic valve implantation (TAVI) procedures are performed electively with weeks to months of pre-procedural assessment and work-up process.

Methods: In the 18 months between August 2016 and February 2018, twenty-two patients, admitted acutely with symptomatic severe aortic stenosis (AS), underwent TAVI during the same admission. The mean age of the patients was 80 (range: 53 – 89). Ten (45%) were female. All procedures were performed via the transfemoral access, and all but one (95%) were there major changes that impacted on clinical care/follow-up. Changes were made to 33(58%) of reports; however, in only 6(10%) were there major changes that impacted on clinical care/follow-up, of which 3 were in inappropriately prioritised TTE.

Conclusion: This prospective study suggests that in a small but significant minority of reports there was a change that altered management and the initial priority given to the report was inappropriate. It appears from our initial results that cardiologist co-reporting continues to add some value, even in TTE deemed near-normal.

http://dx.doi.org/10.1016/j.hlc.2018.05.136

O36

Clinical Outcomes of Tricuspid Valve (TV) Surgery for Tricuspid Regurgitation (TR): A Retrospective Study

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2 Massey University, Auckland, New Zealand
3 University of Auckland, Auckland, New Zealand

Aim: Severe TR causes right heart failure, despite medical treatment. Current guidelines recommend TV surgery for secondary (functional) TR during left sided valve intervention. The aim is to analyse the clinical outcome of TV surgery.

Method: Clinical data (demographics, mortality, length of stay (LOS), EUROscore II, echocardiographic parameters) was analysed retrospectively from patients undergoing surgery for primary (isolated) and secondary TR at a tertiary hospital in New Zealand between January 2005 and March 2017.

Results: Over 12 years (mean follow-up of 939 days), 8% (n = 250) of valve surgeries were for TV (191 repairs, 59 replacements). Patients mean age was 59 ± 14 years, 61% were females and 52% were Maori. 91% (n = 227) were operated for secondary TR. Regardless of etiology, survival was not statistically different. Overall mortality was 25% (30 day mortality 7%,12 months mortality 14%). Mean LOS was 18 days. Patients who underwent concomitant aortic valve (AV) surgery (56%,9/16) had higher mortality compared to concomitant mitral valve (MV) surgery (20%,34/167) or triple valve (AV+MV+TV) surgery (31%,14/45). Pulmonary hypertension (PH) data was available for 236 patients with 26% (52/200) mortality in the moderate/severe group and 24% (8/36) in the no/mild PH group. Echocardiographic data was available for 212 patients. Despite improvement in TR in 82% (n = 174), there was significant decline in right ventricular (RV) function 40% (n = 85) and left ventricular ejection fraction (LVEF) 27% (n = 57) after surgery.

Conclusion: TV surgery appears to have higher mortality risk with decline in heart function. Trans-catheter therapies for TV may be an alternative option for patients.
Abstract

Reference
guideline for the management of patients with valvular heart dis-
ease: a report of the American College of Cardiology/American
Heart Association Task Force on Practice Guidelines. J Am Coll
Cardiol 2014;63:e57.

http://dx.doi.org/10.1016/j.hlc.2018.05.138

O37
Isolated Tricuspid Valve Surgery:
Single-Centre 2001-2017 Experience
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Zealand

Aims: Surgery for the tricuspid valve is often performed
concomitantly with other valve surgery. Isolated tricuspid
surgery is rare and historically higher risk, but is indicated
in severe tricuspid disease with symptoms, right ventricu-
lar dilation or dysfunction. We reviewed the experience of
isolated tricuspid valve surgery at our centre.

Methods: Consecutive patients undergoing isolated tricus-
pid valve surgery at Auckland City Hospital from April 2001
to June 2017 followed-up till December 2017 were retrospec-
tively studied for baseline and operative characteristics, and
in-hospital and follow-up outcomes.

Results: Amongst 54 patients studied, mean age was
54 ± 15 years, 34 (65%) were female, and 32 (59.3%) were
Polynesian ethnicity, mean follow-up 5.0 ± 4.8 years. Com-
monest aetiologies were rheumatic 18 (33%), functional 17
(32%) and endocarditis 7 (13%), and 31 (57%) had previous
cardiac surgery. At least mild left ventricular dysfunction,
right ventricular dysfunction and pulmonary hypertension
were present in 9 (17%), 34 (73%) and 18 (33%). Repair and
replacement were evenly split at 28 (52%) and 26 (48% -
16 bioprosthetic and 10 mechanical prosthesis). In-hospital
outcomes were operative mortality in 6 (11%, 15% for replace-
ment), and composite morbidity 25 (46% - 0 stroke, 14 renal
failure, 15 prolonged ventilation and 12 return to theatre).
One, five and ten-year survival were 87%, 70% and 56%, and
2 (3.7%) and 3 (5.6%) had recurrent endocarditis and redo
operation of tricuspid valve during follow-up.

Conclusion: Isolated tricuspid valve surgery was uncom-
monly performed and patients had unique characteristics.
Surgical mortality and morbidity risk remains high, especially
for valve replacement.

http://dx.doi.org/10.1016/j.hlc.2018.05.139

O38
Mitral Valve Surgery with or without
Concurrent Coronary Artery Bypass
Grafting: 8-year Comparative Cohort Study
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Zealand
2 University of Auckland, Auckland, New
Zealand

Aims: A significant minority of patients undergoing mitral
valve surgery (MVS) have indication for coronary artery
bypass grafting (CABG) as the population ages. Despite this,
the risks of combination surgeries are not well appreciated
and may be more than additive. We compared the character-
istics and outcomes of MVS ± CABG performed at our centre.

Methods: Consecutive patients undergoing isolated MVS
or with concurrent (MVS+)CABG at Auckland City Hospital
during 2005-2012 were analysed and compared for baseline
and operative characteristics and outcomes.

Results: 178 MVS + CABG and 407 MVS patients were
included. MVS + CABG patients had higher age, CCS
and NYHA Class, cardiopulmonary bypass time, and higher
prevalence of urgent surgery, hypertension, diabetes, renal
impairment, myocardial infarction/coronary artery disease,
congestive heart failure/impaired ejection fraction and
peripheral vascular disease, although lower prevalence of
active endocarditis and previous valve surgery (all P < 0.05).
MVS + CABG also had higher mortality (operative 11.2% vs
2.5% P < 0.001; 1 and 5-year mortality 85% vs 96% and 78% vs
87% P < 0.014) and composite morbidity 53.4% vs 18.9%
P < 0.011, including acute renal failure, prolonged ventilation,
return to theatre (all P < 0.001) but not stroke. In multivariable
analyses, MVS + CABG was independently associated with
higher operative mortality odds ratio 2.07 95% confidence
interval 1.09-3.93 and composite morbidity 2.38 (1.03-5.47),
but not long-term mortality P = 0.95.

Conclusion: MVS + CABG compared to MVS patients had
greater operative risk, and were independently associated
with higher operative mortality and composite morbidity,
but once getting through the surgical admission and 30-day
period, they were not independently associated with higher
long-term mortality.

http://dx.doi.org/10.1016/j.hlc.2018.05.140
Abstract

**O39**

**The New Zealand Rheumatic Heart Disease Registry**

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2 Counties Manukau District Health Board, Auckland, New Zealand
3 University of Auckland, Auckland, New Zealand
4 University of Otago, Dunedin, New Zealand

**Background:** Acute rheumatic fever (ARF) has been extensively chronicled in New Zealand. Huge ethnic disparities continue. In contrast, the burden of chronic rheumatic heart disease (RHD) in New Zealand is not well defined. Some surgical outcomes are known and there is data about RHD in pregnancy. Beyond that, morbidity, access to care, adherence to care, and the quality of medical and surgical care are poorly defined.

**Aims:**
- To create the first New Zealand wide contemporary cohort of significant RHD to be known as the NZ RHD registry. This will better define the morbidity and mortality of RHD.
- To establish a governance group for the NZ RHD registry
- To plan retrospective and prospective studies of RHD outcomes

**Methods:** This NZ RHD registry will be populated utilising surgical, echocardiographic and outpatient databases, cross-referencing with ARF registries, ICD hospital discharge and National mortality data.

**Results:** Major funding from the Heart Foundation. Data managers recruited. Collaborating investigators established in all NZ cardiac units. HDEC approval July 2017. Enrolment in the registry has commenced. 850 cases enrolled, pre-dominantly from ADHB data sources by March 2018.

**Conclusion:** The first phase of the New Zealand Rheumatic Heart Disease Registry is now well established. This large study will involves all the cardiac units of New Zealand. The establishment of such a cohort/registry will be a platform to increase understanding of the true morbidity of significant RHD, allow comparisons to the NZ Heart Foundation Guidelines for RHD, and explore inequities by age, region and ethnicity.

http://dx.doi.org/10.1016/j.hlc.2018.05.141

**Genetics/Congenital/Paeds**

**O40**

**From 1000 g to 100 kg: How Does the Heart Cope? Adult Cardiovascular Consequences of Very low Birthweight**

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2 Department of Medicine, University of Otago, Christchurch, New Zealand
3 Department of Psychological Medicine University of Otago, Christchurch, New Zealand
4 Department of Paediatrics, University of Otago, Christchurch, New Zealand

**Aim:** Survival of Very Preterm (VP) birth or Very Low Birth Weight (VLBW) is now the norm rather than the exception. Early life experience can influence human development and later susceptibility to disease; therefore adult outcomes for former preterm infants is of growing concern. This study aims to describe the cardiovascular profile of VLBW adults compared with age matched controls and identify additional risk factors—birthweight, growth restriction, antenatal steroid exposure, postnatal anaemia and blood transfusion.

**Method:** 229 VLBW adults, 71% known survivors of NZ cohort born in 1986 and 100 age matched controls underwent comprehensive evaluation including echocardiographic assessment of cardiac dimensions and function, including measurement of left ventricular volume, mass, systolic and diastolic function. Myocardial velocities and deformation were also assessed.

**Results:** Comparison of VLBW to controls shows clear mean differences on all LV measures and LA area with controls having higher scores. There were significant gender effects for LV mass, LV mass indexed BSA, LVEDV 4C indexed BSA, LVESV 4C indexed BSA.

**Table 1.**

<table>
<thead>
<tr>
<th></th>
<th>LVMass</th>
<th>LVmass/BSA</th>
<th>LA Area</th>
<th>EF 4C</th>
<th>LVEDV 4C/BSA</th>
<th>LVESV 4C/BSA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VLBW (N=228)</strong></td>
<td>165.8 (45.1)</td>
<td>89.7 (19.3)</td>
<td>17.1 (3.0)</td>
<td>0.64 (0.04)</td>
<td>58.3 (10.9)</td>
<td>20.8 (4.9)</td>
</tr>
<tr>
<td><strong>Controls (N=100)</strong></td>
<td>186.1 (54.8)</td>
<td>95.0 (22.3)</td>
<td>18.8 (3.3)</td>
<td>0.64 (0.05)</td>
<td>62.4 (12.4)</td>
<td>22.6 (5.8)</td>
</tr>
<tr>
<td><strong>p</strong></td>
<td>&lt;0.001</td>
<td>0.03</td>
<td>&lt;0.001</td>
<td>0.37</td>
<td>0.002</td>
<td>0.004</td>
</tr>
</tbody>
</table>

1 Actual sample No for VLBW vary between 226 – 228.
2 t-test for independent samples.
Abstract

Conclusion: Former VLBW adults have reduced left ventricular size even when indexed to body size. This may have functional implications in adult life.

http://dx.doi.org/10.1016/j.hlc.2018.05.142

O41
A Titin Truncation Variant Co-segregating with Dilated Cardiomyopathy in a Large Maori Kindred

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2 Auckland District Health Board, Auckland, New Zealand
3 Nisell-Schlegel SARL, Switzerland

Aim: Next Generation sequencing (NGS) has recently identified Titin truncation variants (TTNtv) to be causative in numerous cases of familial dilated cardiomyopathy (DCM). Identifying the underlying molecular cause aids in cascade screening, risk stratification and a pathway for future therapeutic options. Phenotypic characteristics of patients with TTNv are not fully described. We present a large Maori kindred with a highly penetrant TTNv causing DCM.

Method: 7 male family members affected by early onset DCM were identified. 28 inherited heart disease genes were sequenced on an Illumina MiSeq in the proband. Cardioclassifier https://www.cardioclassifier.org/ (Imperial College London, 2017) was used for variant calling. Advanced ECG (A-ECG) analysis was used to compare TTNv carriers and a DCM cohort with unknown TTNv status.

Results: The proband was heterozygote for a nonsense TTNv in the I band (Chr2 c.41880G > A), identified by Cardioclassifier as likely pathogenic. This co-segregated with family members with DCM and was absent in unaffected individuals. Paroxysmal atrial fibrillation and a rate related cardiomyopathy was the presenting hallmark in several family members. The proband had a ventricular fibrillation arrest at the time of pulmonary vein isolation. Two family members have undergone cardiac transplantation and one has been listed for transplantation. A-ECG Spatial QRS-T angle indicated a higher risk for ventricular arrhythmia, in family members with arrhythmic events.

Conclusion: TTNv presented as a highly penetrant pathogenic variant associated with DCM in this kindred. Both atrial and ventricular arrhythmias were common in carriers. TTNv population frequencies should be further explored in indigenous Maori populations, who have high burden of unexplained DCM and possible founder effects.

http://dx.doi.org/10.1016/j.hlc.2018.05.143

Nursing

O42
Five Years of a Non-Physician Cardiovascular Genetics Clinic

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3 Genetic Health Service NZ, Wellington, New Zealand

Aim: To review the characteristics and outcomes of patients and families seen in a non-physician dual-service cardiovascular genetics clinic.


Results: 119 patients were seen from 51 families. The most common indication for referral was diagnosis of hypertrophic cardiomyopathy (23 families), followed by Long QT syndrome (14), Brugada syndrome (5), Resuscitated cardiac arrest (4), dilated cardiomyopathy (2), arrhythmogenic right ventricular cardiomyopathy (2), family history of sudden cardiac death (1), other channelopathy (1).

Diagnostic genetic tests were attempted on 22 affected patients. This identified pathogenic mutations in 2 patients (both Long QT syndrome). Genetic variants were identified in 5 other patients. Predictive genetic tests for known mutations were positive in 2 of 5 relatives of Long QT syndrome patients and 4 of 11 relatives of hypertrophic cardiomyopathy patients.

Clinical tests undertaken at the clinics uncovered new diagnoses of Long QT syndrome in 6 people, hypertrophic cardiomyopathy in 1, and Brugada Syndrome in 1. 3 of the 4 patients seen due to a resuscitated cardiac arrest gained a clinical diagnosis from the clinic due to diagnostic tests and family screening.

Conclusion: The clinic demonstrates utility in identifying clinical causes of unascertained cardiac arrest and stratifying family members’ risk of having an inheritable heart condition. The yield of positive diagnostic genetic test results is less than commonly predicted which may relate to the complexities of the patient group.

http://dx.doi.org/10.1016/j.hlc.2018.05.144
Abstract

S21 Rehabilitation/Prevention

O43 Development and Validation of a Risk Score for Patients Back in the Community After an Acute Coronary Syndrome Event

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Aim: Following acute coronary syndrome (ACS) most patients are managed long-term in primary care yet few tools are available to guide patient-clinician communication and modification of on-going management in that setting. We have developed a cardiovascular risk (CVR) score for patients after an ACS event.

Method: Patients with prior ACS were selected from a New Zealand primary care CVR management database (PREDICT) with linkage to national mortality, hospitalisation, pharmaceutical dispensing, and laboratory data. Cox models with all clinically relevant predictors and an outcome of fatal or non-fatal CV event within 5 years were developed. The CVR score was applied to an external validation cohort of patients assessed 4 months post-ACS.

Results: Derivation: 13,339 patients with ACS (median 1.9 years prior), 62% men, 57% European, median age 63yrs, experienced 3,043 CV events in the subsequent 5 years. CVR increased significantly with age, sex, Maori ethnicity, deprivation, ACS <12mths prior, heart failure, atrial fibrillation, diabetes, smoking, cholesterol ratio, blood pressure ≥160 mmHg, HbA1c ≥65 mmol/mol, creatinine ≥100 umol/L. Median 5yr CVR was 24% (IQR 18-35%), with excellent calibration (figure) and c-statistic 0.69 (95%CI 0.677-0.698).

Validation: 2,014 patients, 72% men, 92% European, median age 67yrs, with 712 CV events in the subsequent 5 years. Median predicted 5yr CVR was 32% (IQR 24-44%), with very good calibration (figure).

Conclusion: A new risk score using clinical data routinely available in primary care has been developed which accurately predicts CVR among patients living in the community after an ACS event. Such models are required for risk stratification over the life-course of CV disease.

http://dx.doi.org/10.1016/j.hlc.2018.05.145

Poster Presentations

Clinical Cardiology, Clinical Trials

P01 Chest Pain Identified as Low Risk for Acute Coronary Syndrome (ACS). Can a HEART Score Pathway Identify More Patients for Early Safe Discharge than the Current TIMI Score Pathway?

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Aim: We compared our current TIMI pathway with a HEART pathway in patients with undifferentiated chest pain in terms of adverse cardiac events and number safely identified as low risk. We audited our management of low risk patients.

Method: We screened consecutive chest pain presentations to ED and ADU in 2 Auckland hospitals. We included 525 patients with TIMI score 0 or 1, and 0 and 2 hours negative contemporary Troponin I. TIMI score and chest pain history was recorded by admitting physician. HEART score and endpoints were captured from electronic data, GP and patient phone calls. The primary endpoint was Adverse Cardiac Events (ACE) within 3 months. The secondary endpoint was measurement of length of stay and further cardiac testing.

Results: 398 had HEART score 0-3 and negative serial TI (low risk HEART) with adverse cardiac event rate of 0.5% (95% CI 0.14 – 1.81). 366 patients had TIMI score 0 with event rate of 1.1% (0.4 – 2.8). The HEART pathway identified 9% more patients as low risk.

56% of our TIMI 0 cohort was referred for exercise treadmill test, 12% for CTCA and 1.6% for coronary angiogram. Average LOS was 8.69 hours.
Conclusion: The HEART pathway safely identifies significantly more patients as low risk compared to our TIMI pathway. WDHB do further cardiac investigation in the majority of our low risk patients, despite an acceptably low miss rate for cardiac events. We can reduce costs significantly by incorporating HEART score in the pathway and by re-education of our physicians.

http://dx.doi.org/10.1016/j.hlc.2018.05.146

P02 Evaluation of Dabigatran Reversal and Outcomes in Patients with Atrial Fibrillation

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Background: The increasing number of patients on Dabigatran in New Zealand for the prevention of stroke in Atrial Fibrillation (AF) has led to a rise in associated complications. Since 2016, Idarucizumab has been approved as a reversal agent for Dabigatran in life-threatening, uncontrollable bleeding or emergency and urgent procedures.

Aim: To review the use of Idarucizumab, concordance with guidelines, and management outcomes in patients with AF.

Method: Patients who received Idarucizumab in the Bay of Plenty region (BOP) from 2016 –2018 were identified from hospital medication database. Clinical records were reviewed for those on Dabigatran for AF. Data including patient demographics, dabigatran dosing, hospital presentation, pre-reversal investigations, and outcomes were documented.

Results: 53 patients received Idarucizumab in the study period, 5 non-AF indications were excluded. Of the 48 patients on Dabigatran for AF, 44 (92%) were appropriate indications for reversal including 32 with major bleeding and 12 for emergency or urgent procedures. 4 cases of inappropriate use were under surgical services. Only 26 (54%) patients had the full recommended pre-reversal coagulation panel. 9 (18%) patients had estimated Glomerular Filtration Rate (eGFR) <30 ml/minute, where dabigatran is contraindicated. In total, 13 (27%) patients died, 2 (4%) strokes, and 6 (11%) major bleeds.

Conclusion: Majority of the patients received Idarucizumab in the BOP for the appropriate indications. However, there is a substantial proportion without full recommended pre-reversal coagulation panel. Furthermore, despite reversal, a significant mortality persists. This audit also revealed patients with renal function inappropriate for Dabigatran.

http://dx.doi.org/10.1016/j.hlc.2018.05.147

P03 Left Ventricular Thrombus (LVT) After ST Elevation Myocardial Infarction (STEMI) in Auckland Region STEMI Network (ARSN)

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Background: Prior to modern reperfusion therapies, LVT was common post-STEMI. LVT is associated with stroke and systemic embolism. There is minimal data regarding LVT in this era of rapid reperfusion therapy.

Aim: To measure the incidence of LVT in patients post-STEMI within the ARSN, and to describe the characteristics, management, and outcome of patients with LVT post-STEMI.

Method: We retrospectively analysed 997 consecutive patients with STEMI at Auckland City Hospital between 2014-2015. Patients with STEMI and LVT were identified using the national registry (ANZACS-QI), ICD coding, and echocardiography database. Patient characteristics, management and outcome were obtained by comprehensive review of clinical notes.

Results: 53 patients (5.3%) had LVT. Of these, 70% were male, mean age 58 years (SD 15), 85% had anterior STEMI, mean LV ejection fraction 37% (SD 8), and 30% had a LV aneurysm. All were diagnosed with echocardiography (8% confirmed using MRI). Oral anticoagulation was initiated in 44 (warfarin 42, dabigatran 2). LVT resolved in 57% at 3 months and 79% by 6 months with warfarin. Using dabigatran, one resolved within 4 months and one crossed-over to warfarin. By 12 months, there were 7 (13%) deaths, 2 (4%) strokes, and 6 (11%) major bleeds.

Conclusion: In this large contemporary analysis, the incidence of LVT was low. Nonetheless, LVT remains associated with a high risk of death, stroke and major bleeding. Warfarin remains the anticoagulant of choice. Further study into the efficacy of novel oral anticoagulation for the treatment of LVT is warranted.

http://dx.doi.org/10.1016/j.hlc.2018.05.148
Left Ventricular Free Wall Rupture Following Acute Myocardial Infarction: A South Canterbury Experience

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Left ventricular free wall rupture following acute myocardial infarction is a rare but significant complication in the current era of percutaneous coronary intervention. Unfortunately, the risk remains high in secondary hospitals where thrombolysis continues to be the primary management for all patients presenting with acute ST elevation myocardial infarction (STEMI).

We present the case of a 69 year old lady who presented with a late presentation posterolateral STEMI who was thrombolysed and subsequently developed an early subacute rupture. This was confirmed on transthoracic echocardiography.

On review of the literature, we note the potential dangers of routinely thrombolysing all apparent STEMI's who present to secondary hospitals. Careful clinical consideration should be undertaken before we potentially add to the patient’s list of complications. This would be an important consideration given the current South Canterbury patient demographics and generally stoic population whose access to health care have geographical limitations.

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Real World Experience with Entresto in Heart Failure Patients from Regional North Queensland

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Aim: Evaluate the effectiveness of Entresto (Sacubitril/valsartan), a heart failure medication, at the Mackay Base Hospital.

Method: Our clinical audit evaluated 28 consecutive heart failure patients with a mean age of 62 years who were already tolerating maximum doses of angiotensin converting enzyme inhibitors and beta-blockers. Specifically, the cohort comprised of patients in all NYHA classes: class I (2), II (15), III (6) and IV (5). Our primary outcomes included: left ventricular ejection fraction (LVEF), B-type natriuretic peptide (BNP), creatinine, estimated glomerular filtration rate, 6-minute walk test (6MWT). Outcomes were compared at baseline and 6 months post Entresto. The secondary outcomes included the evaluation of responses to the Self-assessment of NYHA (SA-NYHA).

Results: The mean LVEF increased from 30 ± 9% to 42 ± 10% (p < 0.01) at 6 months. The average BNP decreased from 766 ± 1201 pg/mL to 328 ± 511 pg/mL (p < 0.01). 6MWT distance improved from 288 ± 159 m to 394 ± 188 m (p = 0.004). 32%, 54% and 14% of patients respectively reported an improved, unchanged or a worse NYHA score. 80% of NYHA class 4 patients improved their SA-NYHA score by at least 1 class.

Conclusion: Similarly to the PARADIGM-HF study, our results confirm that Entresto is effective in improving the cardiac function and exercise capacity of patients who were previously tolerating maximal heart failure therapy. Unlike the study however, our small cohort included a greater percentage of NYHA class 4 patients (8.8% vs 18%). Thus, we also demonstrated that Entresto can benefit a broader spectrum of heart patients including those classified as NYHA IV.

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Left Ventricular Evaluation in ACS Patients: Impact in Patient Discharge and Outcomes

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Inpatient LV assessment post ACS is a recommended practice in most guidelines. In a busy hospital, performing an inpatient echocardiography may delay patient discharge.

Aim:
1) Does awaiting inpatient echocardiography in NSTE-ACS patients have any impact on discharge timing?
2) When LV assessment is planned as an outpatient or not performed at all does it have an adverse outcome?

Method: Patients admitted with NSTEACS over a 6month period to Waikato hospital were included. There were 3 cohorts: inpatient LV assessment, planned outpatient LV assessment and no LV assessment post index admission. Data was collected from ACSQI website and electronic hospital database.

Results: Of 297 patents admitted with ACS 182 were identified as NSTEACS. The mean follow-up was 238 days, which was similar in all 3 cohorts. Out of 119 patients who had inpatients LV assessment 3.3% (4pts) encountered a delayed discharge, 11% were admitted with a cardiac event. Planned out patient echocardiography was done only in 14% at the recommended time frame of 3 months in whom no cardiac events were noted. 21% (3 of 14) of patients who were awaiting outpatient echocardiography had a cardiac event needing readmission. Out of 63 patients with no LV assessment planned at discharge 35% (17pts) suffered a cardiac event. In spite of high readmission rates, 2% were admitted due to heart failure which might have been altered by a LV assessment.

Conclusion: It appears readmission due to cardiac events post NSTEACS is reduced by a timely LV assessment without significant delays in discharge. However from this study it is uncertain performing a LV assessment could have prevented these readmissions.

http://dx.doi.org/10.1016/j.hlc.2018.05.151
Coronary Artery Disease (Clinical and Intervention)

http://dx.doi.org/10.1016/j.hlc.2018.05.153

Use of Combination Antiplatelets and Anticoagulant Therapy Post Acute Coronary Syndrome at Waikato DHB

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Aim: European Society of Cardiology (ESC) recommends triple therapy (dual antiplatelets and anticoagulant) following Acute Coronary Syndrome (ACS) to be limited to 1 month if bleeding risk is high and 6 months if bleeding risk is low to optimise bleeding and incidences of Major Cardiovascular Events (MACE). Retrospective audit was undertaken at Waikato Hospital to explore the combinations of antiplatelet and anticoagulant therapy used in patients following ACS; and to determine the incidences of MACE and bleeding within one year.

Method: ANZACS database was used to identify patients who presented to Waikato Hospital from July 2015 to July 2016 with ACS. 64 patients were identified from Clinical Work Station (CWS) who also required anticoagulation. Including antiplatelets/anticoagulant on discharge, data were collected to calculate CHA2DS2-VAsc and HASBLED score; and incidences of significant bleeding and MACE determined.

Results: 28 (44%) of 64 patients were prescribed triple therapy. Durations were - 5 (18%) for 1 month, 11 (39%) for 1 month, and 2 (7%) for less than 1 month. 11 (36%) were within ESC recommendation, TIMI major bleeding and MACE on triple therapy were 7% and 5% respectively while it was 0 and 28% respectively on 36 patients who did not receive triple therapy.

Conclusion: Troponin elevation not due to CAD can be due to multiple conditions. The risk of CAD-related events at one year in these patients was much less than patients who present with CAD-related cTn elevation. To investigate such patients for CAD may have low yield.

http://dx.doi.org/10.1016/j.hlc.2018.05.152

Coronary Artery Disease (Clinical and Intervention)

P10

Should We Investigate All Hospitalized Patients with Elevated Cardiac Troponin for Coronary Artery Disease

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Aim: Many patients presenting acutely with elevated cardiac troponins (cTn) undergo investigation for coronary artery disease (CAD), even in the absence of symptoms and signs of CAD. This audit followed patients presenting acutely with elevated cTn that did not appear to be related to CAD.

Method: The one year incidence of fatal and non-fatal myocardial infarction (MI) and revascularization-2017 was determined in all patients with elevated cTn in Christchurch Hospital in February 2017.

Results: Of the 322 inpatients with elevated cTn, 118 had CAD-related cTn elevation. At one year, there were 15 deaths (12.2%), 8 non-fatal MI (6.5%) and 4 (3.4%) were revascularized. The cause of death was definite AMI in 7 (5.8%), other cardiovascular in 1 (0.8%) and unknown in 4 (3.4%). The 215 non-CAD-related elevations were due to type 2 myocardial infarction, multifactorial myocarditis, TIMI post non-coronary cardiac procedures, chronic elevation and unclear causes. At one year there were 38 deaths (41.0%), 6 non-fatal AMI (2.9%) and 2 (1%) were revascularized. The cause of death was definite AMI in 6, other cardiovascular in 10 (4.8%) and unknown in 5 (2.4%).

Conclusion: Troponin elevation not due to CAD can be due to multiple conditions. The risk of CAD-related events at one year in these patients was much less than patients who present with CAD-related cTn elevation. To investigate such patients for CAD may have low yield.

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P09

Clinical Predictors of Adverse Prognosis in Myocarditis

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Aim: Myocarditis is a common cardiac presentation, and may mimic acute coronary syndromes (ACS). Prognostic information in ACS is obtained from clinical variables and validated scoring systems, but there is limited data on the predictive value of such clinical variables in myocarditis. We aimed to identify clinical, biomarker and imaging factors associated with adverse outcomes for New Zealand patients presenting with myocarditis.

Method: 178 patients with a recorded diagnosis of myocarditis (2007-2016) were reviewed. Clinical data was collected, including presenting symptoms, biomarkers, electrocardiogram (ECG) findings and imaging results. Analysis used a composite endpoint of major adverse cardiac events (MACE).

Results: Patients were younger (mean age 41.3 ± SD 17 years) and 71% were male. MACE occurred in 26 patients (15%), over 8 years of follow-up. The most common MACE was recurrent myocarditis (13, 50%). Of presenting symptoms, only dyspnoea was associated with MACE (25% vs 9%, HR <3.3, 95%CI 1.5-7.3, p = 0.003). Chest X-ray (CXR) evidence of acute decompensated heart failure (ADHF) were associated with MACE (46% vs 11%, HR =5.3, 95%CI 2.3-13.3, p <0.001), as was left ventricular ejection fraction <50% on echocardiography (24% vs 7%, HR =3.2, 95%CI 1.3-8.1, p =0.013). Only CXR evidence of ADHF on presentation was independently predictive. Chest pain, presenting/peak troponin levels, and ECG changes including ST elevation were independently predictive. Chest X-ray (CXR) evidence of acute decompensated heart failure (ADHF) on presentation was independently predictive. Chest X-ray (CXR) evidence of acute decompensated heart failure (ADHF) was recurrent myocarditis (13, 50%). Of presenting symptoms, only dyspnoea was associated with MACE (25% vs 9%, HR <3.3, 95%CI 1.5-7.3, p = 0.003). Chest X-ray (CXR) evidence of ADHF were associated with MACE (46% vs 11%, HR =5.3, 95%CI 2.3-13.3, p <0.001), as was left ventricular ejection fraction <50% on echocardiography (24% vs 7%, HR =3.2, 95%CI 1.3-8.1, p =0.013). Only CXR evidence of ADHF on presentation was independently predictive. Chest pain, presenting/peak troponin levels, and ECG changes including ST elevation were independently predictive.

Conclusion: In keeping with a wide range of cardiac pathologies, clinical and imaging indicators of left ventricular dysfunction have important prognostic value in patients with myocarditis. We aimed to identify clinical, biomarker and imaging factors associated with adverse outcomes for New Zealand patients presenting with myocarditis.

P11

Abstract
Abstract

32 different combinations of mono, dual and triple therapies were identified.

Conclusion: Our audit highlights wide variations in the use of combination antithrombotic therapy following ACS at Waikato DHB. TIMI major bleeding only occurred on triple therapy without much reduction in MACE.

http://dx.doi.org/10.1016/j.hlc.2018.05.154

P12

What is the Optimal Rate of Invasive Coronary Angiography After Acute Coronary Syndrome? - An ANZACS-QI Substudy

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2 Institute for Innovation and Improvement (i3), Waitemata District Health Board, Auckland, New Zealand
3 Department of Cardiology, Waitemata District Health Board, Auckland, New Zealand

Background: Wide variability in the use of invasive coronary angiography in acute coronary syndromes (ACS) has been previously documented. Our aim was to investigate whether coronary angiography is being used appropriately after ACS, taking into account relative contraindications of the procedure.

Method: Patients presenting with ACS in 2015 to two New Zealand (NZ) District Health Boards (DHBs) – Counties Manukau (CMDHB) and Waitemata (WDHB) - were identified from the NZ Ministry of Health National Dataset using ICD-10-AM codes. Patient data were obtained from the electronic and paper clinical records. Pre-defined relative contraindications to coronary angiography were identified.

Results: Of the 3,809 patient admissions coded with ACS, 600 (300 from each DHB) were reviewed. 61 (10%) did not meet diagnostic criteria for ACS on review of clinical data and were excluded. Of the patients reviewed, 55% received coronary angiography, with a higher rate in WDHB than CMDHB (61% and 49%, respectively). The overall rate of angiography was appropriately high in those without a relative contraindication (90.3%) and low in those with one (7.4%). There were fewer patients with relative contraindications in WDHB than CMDHB (36.7% and 48.5%) but the rate of angiography in those without (92.5% and 87.5%) contraindications in the two DHBs was similar.

Conclusion: Approximately 60% of patients had no documented relative contraindication suggesting that this may be an appropriate angiography rate in New Zealand practice. Differences between the two DHBs of around 10% appear to be clinically appropriate due to variation in contraindication rates.

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limiting lesions, LCx or RCA territory lesions have higher values that were 0.95, LCx 1.00, and RCA 0.97. Twenty-three lesions had iFR lesions. No LAD or LMCA lesion had an iFR value back. Of these lesions, 13 (57%) were in the LCx (45% of all

Abstract

Background: Coronary physiological assessment has been used increasingly to guide the decision-making in percutaneous coronary intervention (PCI).

Methods: A total of 115 patients underwent assessment of 169 coronary atherosclerotic lesions using instantaneous wave-free ratio (iFR) in Christchurch Public Hospital between 29/05/2017 and 13/02/2018. Five lesions were in the left main coronary artery (LMCA), 101 in the left anterior descending (LAD), 29 in the left circumflex (LCx), and 34 in the right coronary artery (RCA).

Results: The number (percentage) of haemodynamically significant lesions (iFR < 0.90) in each coronary territory was 40 (40%) in LAD, eight (28%) in LCx, and four (12%) in RCA. The mean iFR value for haemodynamically insignificant lesions (iFR ≥ 0.90) in each coronary territory was: LAD 0.95, LCx 1.00, and RCA 0.97. Twenty-three lesions had iFR values that were ≥ 1.0 despite no significant drift on pull-back. Of these lesions, 13 (57%) were in the LCx (43% of all LCx lesions) and 10 (43%) were in the RCA (29% of all RCA lesions). No LAD or LMCA lesion had an iFR value ≥ 1.0.

Conclusion: In our limited observation, among non-flow limiting lesions, LCx or RCA territory lesions have higher mean iFR than those in LAD and are more likely to have iFR measured at ≥ 1.0. The exact mechanism for this observation and its impact on PCI decision-making are not clear. Prospective studies to further investigate this observation and how it relates to fractional flow reserve (FFR) measurements are to commence at our centre and the results will be reported.

http://dx.doi.org/10.1016/j.hlc.2018.05.158

P15

Cut-off Values in Coronary Physiology: Does One Size Fit All Vessels?

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2 University of Otago, Christchurch School of Medicine, Christchurch, New Zealand

Conclusion: Myocardial Infarction related hospitalization continues to decline at a steady rate. This decline may be suggestive of improvement of primary and secondary prevention efforts.

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Family History of Premature Coronary Artery Disease: Accuracy and Predictor of Risk

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Family history (FHx) of premature coronary artery disease (CAD) is a strong predictor of cardiovascular risk. However, it is unclear how reliably FHx is recorded in the clinical record. In addition, FHx is often treated as binary, despite evidence that graded scoring tools provide superior risk stratification [1]. The complexity of these tools have limited their adoption. We examined 1) accuracy of documentation of FHx in the clinical record, and 2) whether a simple grading based upon a detailed family pedigree correlated with the statistically derived score.

We enrolled 43 patients <60 years with angiographically confirmed myocardial infarction, and took a detailed family pedigree and compared this with the FHx documented in the clinical record. We also derived a family risk score [1] and examined whether this correlated with a simple classification scheme of no, weak, moderate or strong evidence of an inherited basis for disease applied by a clinician.

Of the 43 study patients, 27 (62.7%) had ≥ 1 first degree relative with CAD <60 years according to a family pedigree. The clinical record noted a FHx of premature CAD in 17 (39.5%). Of the 26 subjects with no FHx of premature CAD recorded in the clinical record, 10 had at ≥ 1 first degree relative with CAD <60 years according to a family pedigree. The clinician classification of FHx had a 0.75 correlation with family risk score.

The FHx recorded in the clinical records was relatively inaccurate. A simple classification based on family pedigrees may be useful in grading FHx beyond a simple binary classification.

Reference


http://dx.doi.org/10.1016/j.hlc.2018.05.159
Abstract

P17

PCI Following Bypass Graft Failure is Associated with Poor Clinical Outcomes

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Background: Coronary artery bypass grafts may fail leading to angina or MI. Results of PCI to Saphenous vein grafts (SVGs) have been poor. We hypothesized with modern PCI techniques and medical therapy, outcomes would improve.

Method: The ANZACS-QI database identified all patients with prior CABG who had PCI in Christchurch over 3 years from July 2012 to 2015. Primary outcome measures were death, MI and target lesion revascularisation (TLR) over two year follow up.

Results: We identified 102 patients, of which 48 had PCI to SVG, 54 to native vessel. 13 patients had PCI for early graft failure (<18 months) with 3 to SVGs and 10 to natives. Early graft failure patients had 8% death, 30% MI and 23% TLR. Late graft failure occurred in 89 patients with 42 having PCI to SVG and 38 PCI to native. PCI was unsuccessful in 9 patients and 44% of these patients died. Demographics and outcomes of successful PCI after late graft failure are presented in the table.

Late Graft Failure
PCI to SVG PCI to native P value

<table>
<thead>
<tr>
<th>No.</th>
<th>42</th>
<th>38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>73</td>
<td>72</td>
</tr>
<tr>
<td>Mean Graft age</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Diabetes</td>
<td>38%</td>
<td>11%</td>
</tr>
<tr>
<td>Death</td>
<td>17%</td>
<td>5%</td>
</tr>
<tr>
<td>MI</td>
<td>36%</td>
<td>11%</td>
</tr>
<tr>
<td>TLR</td>
<td>38%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Conclusion: Despite advances in drug eluting stents, PCI after graft failure is associated with high rates of death, MI and TLR. PCI to native vessels, when possible, may provide more durable outcomes. Further study is required to determine the optimum revascularisation strategy for failed bypass grafts.

http://dx.doi.org/10.1016/j.hlc.2018.05.160

P18

Rescue Percutaneous Intervention - Is There a Perfect Time?

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Background: Rescue percutaneous coronary intervention (rPCI) for ST elevation myocardial infarction (STEMI) is defined as mechanical reperfusion for failed fibrinolysis. Randomised trials on rPCI are characterised by small study populations and major differences in methodology. In particular, there is no consensus on defining the appropriate timing of rPCI for better outcomes.

Aim: To determine an appropriate cut off time period for rPCI in STEMI patients with failed thrombolysis that will predict better outcomes.

Methods: We performed a retrospective study on STEMI patients with failed thrombolysis managed by rPCI in the Midland region of New Zealand (NZ) between January 2014 and December 2015. Clinical outcomes assessed were mortality and left ventricular ejection fraction (LVEF) at 12 months follow up.

Results: A total of 86 patients underwent rPCI with an average age of 62.87 ± 13.24 SD. There were 71 males (82.56%) and 15 females (17.44%). Average time to rPCI post failed thrombolysis was 511.78 ± 50 SD. Total deaths at 1 year was 18 (20.93%). Mean LVEF on follow up was 46.2% ± 12 SD. Mortality correlated significantly with longer time for rescue (p = 0.0008). There was also a significant negative correlation between LVEF and time to rPCI (p < 0.0001). Cut off point of time to rPCI for predicting abnormal LV function (<50%) is 350 minutes.

Conclusion: The benefits of rPCI on mortality and LV function diminish with time. Larger studies are needed to compare outcomes in rPCI vs conservative management to define optimal time windows.

http://dx.doi.org/10.1016/j.hlc.2018.05.161
We evaluated beta2microglobulin (β2M). High Lp(a) predicts risk of early atherosclerosis independently of other cardiac risk factors while apo B and apo B/apo A1 ratio has been shown to be better predictor of CAD than LDL.

Aim: To study the association of novel risk markers β2M, Lp(a), apo A1 and apo B in CAD patients and their correlation with its severity.

Method: 1052 consecutive patients undergoing coronary angiography were studied and divided into cases (862) and controls (190).

Results: Hypertension was most common (35.17%), while diabetes, positive family history of CAD and smoking were present in 28.42%, 17.49% and 16.73% patients respectively. Patients with CAD had significantly higher β2M (2.0 vs 1.2 mg/l p < 0.01), higher Lp(a) (69.36 vs 52.01 mg/dl, p < 0.01) and higher apoB/apoA1 (1.79 vs 0.65 p < 0.01) levels than normal. β2M levels in triple vessel disease (2.34 ± 0.84 mg/l) patients were significantly higher. Patient with triple vessel disease had significantly higher levels of Lp(a) (80.33 ± 64.02 mg/dl) than single (60.65 ± 52.85 mg/dl, p = 0.001) or double vessel disease (65.09 ± 58.13 mg/dl, p = 0.008). ApoA1 levels were significantly lower in triple vessel disease (104.64 ± 25.66 mg/l).

Conclusion: Beta2microglobulin, Lipoprotein(a), apo A1 and apo B/apo A1 ratio are significantly correlated with the severity of CAD and can serve as novel biomarkers. These biomarkers in addition to conventional risk factors can help in better assessment of CAD risk especially in south Asian population.

http://dx.doi.org/10.1016/j.jhc.2018.05.162
Abstract

In contrast, the number of coronary angiograms performed has increased from 337 in 2013 to 400 in 2017.

Conclusion: Analysis of ANZACS-QI data from Tauranga Hospital showed that although the total number of suspected ACS episodes has been declining, the number of coronary angiography has increased. This is in keeping with the recent data showing the rate of ACS is declining nationwide.

http://dx.doi.org/10.1016/j.hlc.2018.05.164

Electrophysiology

P22
Electrophysiology Studies and Ablation Outcomes: 12 Years of Personal Experience

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2 Auckland City Hospital, Auckland, New Zealand
3 Mercy Hospital, Auckland, New Zealand

Background: Electrophysiology (EP) studies and ablations have become an increasingly critical part of cardiovascular medicine. We aimed to present 12 years of outcomes and complication rates of EP studies and ablations performed in a New Zealand population by a single electrophysiologist in Auckland.

Method: All EP procedure reports were systematically collected from 2005-2016, including success rate and acute complications. Electronic records were systematically reviewed 12 to 24 months post procedure to identify late recurrence and complications.

Results: A total of 2073 procedures were performed. Atri-oventricular nodal reentrant tachycardia (AVNRT), atrial flutter (AFL), diagnostic studies and accessory pathway (AP) accounted for 85% of cases. There were no pulmonary vein isolation cases. 1786 arrhythmias were targeted, with an acute success rate of 92.90%. Recurrence rate was 2.53% whilst major complication rate was 1.88%.

<table>
<thead>
<tr>
<th>Number of cases</th>
<th>Acute success</th>
<th>Recurrence</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>2073</td>
<td>92.90%</td>
<td>2.53%</td>
</tr>
<tr>
<td>AVNRT</td>
<td>604</td>
<td>98.34%</td>
<td>1.0%</td>
</tr>
<tr>
<td>AFL</td>
<td>568</td>
<td>91.90%</td>
<td>4.21%</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>316</td>
<td>-</td>
<td>1.58%</td>
</tr>
<tr>
<td>AP</td>
<td>266</td>
<td>92.48%</td>
<td>3.25%</td>
</tr>
<tr>
<td>Idiopathic VT</td>
<td>134</td>
<td>82.84%</td>
<td>0.90%</td>
</tr>
<tr>
<td>AT</td>
<td>96</td>
<td>87.50%</td>
<td>1.19%</td>
</tr>
<tr>
<td>AV node ablation</td>
<td>69</td>
<td>97.10%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Major complication rate
Overall 1.88%
Unplanned pacemaker insertion 0.43%
Venous thromboembolism 0.39%
Vascular injury requiring intervention 0.39%
Pericardial effusion requiring intervention 0.19%
Systemic emboli 0.14%
Acute pulmonary oedema 0.10%
Phrenic nerve injury 0.05%
Other 0.19%

Conclusion: Our experience is consistent with EP studies and ablations having a high success rate with low rates of recurrence and major complications.

http://dx.doi.org/10.1016/j.hlc.2018.05.165

P23
Urgent DC Cardioversion or Ablation for Atrial Fibrillation or Atrial Flutter and Acute Decompensated Heart Failure

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Middlemore Hospital, Auckland, New Zealand

Background: Guidelines recommend initial rate control in haemodynamically stable patients with atrial fibrillation (AF) or atrial flutter (AFL) and acute decompensated heart failure (ADHF). However, patients with persistent tachycardia or worsening heart failure despite medical therapy may require restoration of sinus rhythm. There is limited data on urgent rhythm control. We investigated the outcomes of patients managed with urgent DC cardioversion (DCCV) or ablation.

Method: We retrospectively analysed patients presenting with AF or AFL and ADHF with LVEF ≤40% who underwent inpatient TOE-guided DCCV or ablation. Primary endpoint was the one year composite outcome of mortality or rehospitalisation for stroke, myocardial infarction, arrhythmia or ADHF.

Results: 79 patients were identified, including 33 with AF (32 DCCV, 1 ablation) and 46 with AFL (22 DCCV, 24 ablation). The primary endpoint occurred in 47% of patients. This was lower in the AFL-ablation subgroup compared to AFL-DCCV (22% vs 64%, P = 0.0056). At one year, mortality was 2.5%, 19% were rehospitalised for ADHF and 38% were rehospitalised for arrhythmia or ADHF. Sinus rhythm at 24 hours was 88.6%, with 42.9% clinical recurrence at one year. In the 63 patients with follow-up LVEF assessment (mean 5.3 months), 42.9% had LVEF > 50% and 74.6% had LVEF > 40% (P = <0.0001). Sinus rhythm at repeat LV assessment was associated with better LV function (LVEF > 40% in 82% vs 46.2%, P = <0.0038).

Conclusion: Urgent DCCV or ablation for AF or AFL and ADHF had low mortality rates and rehospitalisation for heart
Abstract

failure. AFL-ablation had fewer events compared to AFL-DCCV. LV function improved substantially at follow-up.

http://dx.doi.org/10.1016/j.hlc.2018.05.166

P24

Pacemaker Implantation Practice and Early Complications in New Zealand: A 3-Year Analysis from the All New Zealand Acute Coronary Syndrome-Quality Improvement Device Registry (ANZACS-QI DEVICE)

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3 Wellington Hospital, Wellington, New Zealand
4 Auckland City Hospital, Auckland, New Zealand
5 Tauranga Hospital, Tauranga, New Zealand

Aim: The ANZACS-QI DEVICE registry, introduced to NZ public hospitals in 2014, was collaboratively developed by Heart Rhythm New Zealand and Counties Manukau DHB. This study utilises the registry to report contemporary NZ pacemaker implant practice.

Method: Completed records of new pacemaker implants from the ANZACS-QI DEVICE registry between 1st July 2014 to 30th June 2017 were analyzed. Complications were recorded up to the first follow-up device clinic a minimum of 4 weeks after implant. 5466 pacemaker implant entries were completed, with 4339 (79.4%) new implants. This study reports the new implants.

Results: The median age was 77 years, 60.3% were male, 83.5% European and 7.3% Māori. Two-thirds of procedures were acute. The most common symptoms were syncope (38.8%) and dizziness (28.7%). Conduction system disease (38.0%) and sinus node dysfunction (24.4%) were the most common aetiologies. The most frequent ECG findings were third degree atrioventricular block (28.5%), sick sinus syndrome (19.2%) and atrial fibrillation with bradycardia (18.2%).

Northern region performed 46.5% of implants, followed by Midlands 25.3%, Central 11.2% and Southern 17.0%. The device prescription was dual chamber in 66.0%, single chamber in 30.5% and CRT-P in 3.5%.

In the CRT-P subgroup, 88.6% had NYHA II-III symptoms and 88.0% had LBBB. Mean QRS duration was 161.0ms with a mean LVEF of 28.8%.

Complication rate was 7.3%, including haematoma (0.8%), infection (0.6%), pneumothorax (0.5%) and cardiac perforation (0.1%). Lead re-operation was required in 2.8%.

Conclusion: This analysis provides contemporary data of pacemaker implantation practice and early complications across New Zealand.

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P25

Performance of Risk Scores at Predicting New Atrial Fibrillation After Aortic Valve Replacement

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2 University of Auckland, Auckland, New Zealand

Background: Post-operative new onset atrial fibrillation (AF) is common after cardiac surgery, associated with morbidity, mortality and increased length of stay. Targeted approach to managing post-operative AF requires accurate risk stratification, and new scores have recently been developed for cardiac surgery. We assessed the predictors and performance of risk models at predicting new AF after aortic valve replacement (AVR).

Methods: Consecutive patients undergoing isolated AVR without pre-operative at Auckland City Hospital during 2005-2015 were studied. The EuroSCOREs, STS Score, CHADS2, CHA2DS2-VASc, El-Chami AF risk index and POAF scores were calculated and AF prediction performance compared.

Results: There were 502 (of 620) AVR patients with no history of AF and post-operative AF occurred in 145 (29%) and was associated with prolonged ventilation >24 hours, prolonged hospital stay and composite morbidity (P < 0.05).

Age, urgent surgery, hypertension and mitral regurgitation were identified as independent predictors of post-operative AF. Areas under the curve (95% confidence intervals) for predicting new AF by risk scores were EuroSCORE 0.62 (0.56-0.67), EuroSCORE II 0.61 (0.55-0.66), STS Score 0.64 (0.59-0.69), CHADS2 0.64 (0.58-0.69), CHA2DS2-VASc 0.64 (0.59-0.69), El-Chami AF risk index 0.55 (0.50-0.61) and POAF 0.67 (0.62-0.72).

Conclusion: New AF after AVR was common, and associated with prolonged hospital stay and composite morbidity, but was only modestly predicted by most cardiac surgery and AF risk models, with the POAF score having the best performance. Further research of AF-specific scores with larger derivation cohorts and external validation are required to optimise accuracy and establish clinical utility.

http://dx.doi.org/10.1016/j.hlc.2018.05.168
Abstract

S31

P26

Surgical Left Ventricular Epicardial Lead Placement at Time of Cardiac Surgery: Worth the Effort?

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2University of Auckland, Auckland, New Zealand

Background: The epicardial left ventricular (LV) lead for cardiac resynchronisation therapy (CRT) is usually placed transvenously via the coronary sinus. Surgical placement is another option during concomitant cardiac procedures. We reviewed surgical LV epicardial lead placement at time of cardiac surgery and subsequent use of CRT.

Methods: All patients undergoing surgical LV epicardial lead placement from July 2012-July 2017 at Auckland City Hospital were retrospectively studied for characteristics, subsequent CRT device use, and lead outcome.

Results: 47 patients mean age 66 ± 12 years and 15(32%) female were studied, with 37 having concomitant valve surgeries, 13 coronary surgeries (3 combined), and only 2(4%) had a previous transvenous attempt. Indications were heart failure, left bundle branch block (>150ms) and ejection fraction <35% in 18(38%), pacing indication with impaired ejection fraction in 25(53%), and tricuspid valve surgery with heart block 4(9%). 40 patients had suitable radiographic data for lead position review, with only 21 leads seen in appropriate sites. The LV lead was connected to a CRT device during follow-up in only 49% (8 during cardiac surgery, 9 during same admission, and 6 post-discharge). One patient required reintervention for late lead dislodgement (150 days). There were 4 in-hospital deaths and 2 late deaths.

Conclusion: Only half the patients with surgical LV epicardial leads were subsequently connected to a CRT device. Furthermore only half of the epicardial leads were in adequate anatomical positions. Selection criteria for appropriate implantation of LV leads requires further modification to avoid unnecessary additional complexity to cardiac surgical procedures.

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Heart Failure

P27

Target Doses of Secondary Prevention Medications Are Not Being Achieved in Patients with Reduced LV Systolic Function After Acute Coronary Syndrome in New Zealand: An ANZACS-QI Study

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Background: Patients with reduced ejection fraction (rEF, LVEF <40%) are at high risk for adverse outcomes and benefit from evidence based doses of angiotensin converting enzyme inhibitors (ACEi)/angiotensin II receptor blockers (ARB) and beta-blockers. Our aim was to investigate the dispensing and up-titration of ACEi/ARB and beta-blockers following acute coronary syndrome (ACS) in patients with rEF.

Method: Patients presenting with ACS who underwent coronary angiography during 2015 were recorded in the All New Zealand Acute Coronary Syndrome Quality Improvement (ANZACS-QI) registry. Medication dispensing on discharge and at one year post-discharge were obtained using anonymised linkage to the national pharmaceutical dataset. Medication doses dispensed were compared to target doses recommended in clinical guidelines.

Results: 4082 patients were included in the study of whom 602 (14.7%) had rEF. A higher proportion of patients with rEF were prescribed ACEi/ARB on discharge compared to those with preserved ejection fraction (89.0% vs. 68.4%). Similarly rates of beta-blocker dispensing on discharge was higher in the rEF group (90.7% vs. 83.3%).

In the rEF subgroup, 75.6% were maintained on ACEi/ARB and 84.7% on beta-blockers by 1 year of follow up. However, in the rEF group at discharge only 30.6% and 29.2% were on ≥50% of target ACEi/ARB and beta-blocker dose respectively, and by one year this had increased only slightly to 33.9% and 34.8% respectively.

Conclusion: Dispensing of ACEi/ARBs and beta-blockers is high at discharge following ACS with rEF. However dispensing rates fall by one year post-discharge and few patients achieved doses used in the clinical trials.

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Abstract

**Association Between Ventricular Mass Index and the Long Term Prognosis of Patients with Heart Failure and Reduced Left Ventricular Ejection Fraction**

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Germain Hospital, Capital Federal, Argentina

**Backgrounds:** In patients with heart failure and reduced ejection fraction (HFrEF), the increase in ventricular mass by new techniques improves their exercise and functional class.

**Aim:** To evaluate the association between ventricular mass index (VMI) and long term survival in patients with HFrEF.

**Method:** Patients with HFrEF hospitalized in a coronary unit of a Community Hospital were prospectively included. VM and VMI were analysed in all patients by echocardiogram using Devereux formula. The qualitative variables were expressed as percentages and the quantitative ones, as means or medians (interquartile range 25-75). A bivariate Pearson correlation analysis was performed to identify variables linearly associated with VM values and a Cox regression analysis to identify predictors independently associated with mortality at follow-up. A value of p < 0.05 was considered significant.

**Results:** Of 380 analysed patients, 32% had HFrEF. Average age was 75 years (± 14) and 40% were women. The median follow-up was 36 months (interquartile range 25-75:10-56). Follow-up was obtained for 100% of the patients. Mortality was 59%. VMI correlated significantly with age, ejection fraction, left atrial diameter, creatinine clearance, and haematocrit. Median VMI was 195 g/m² in the surviving patients and 184 g/m² in those who died at the end of the follow-up, p = 0.02. In the Cox logistic regression analysis, the male gender, age, functional class of the New York Heart Association prior to admission and VMI were independent predictors of mortality.

**Conclusion:** The VMI is independently associated with long term survival in patients with HFrEF. This preliminary information could support the positive results observed in trials that increase VM in these patients.

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**Imaging**

**Performance of a Down-sized Echocardiographic Protocol to Expedite the Clinical Care of Outpatients with Heart Murmurs**

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Waikato District Health Board, Hamilton, New Zealand

**Background:** Transthoracic echocardiography (TTE) is frequently requested by physicians in the outpatient setting to assess heart murmurs. Progress in imaging technology has improved diagnostic quality but often at the expense of workflow, resulting in prolonged wait-times for TTE in many public hospitals.

**Aim:** To evaluate the use of a 15-minute protocol to screen asymptomatic outpatients with a heart murmur, particularly with regard to impact on resource.

**Method:** 87 patients (predominantly referrals from general practice) with murmurs, identified as “asymptomatic”, underwent the 15-minute screening protocol at Waikato Hospital. Basic demographics, indication for TTE, need for further TTE/other cardiac test, and need for clinical follow-up were collected prospectively. If a significant pathology was identified requiring imaging beyond the short protocol, the patient was brought back for a more complete evaluation.

**Results:** 51(58%) were female. 7(8%) required full urgent TTE and 2(2%) TEE to further evaluate their cardiac abnormality. 13(15%) required follow-up TTE >1year. 24(27%) required clinical follow-up, either urgently or at 1 year. 30(34%) needed some form of follow-up whereas 57(66%) had a normal/mildly abnormal scan prompting discharge, with a letter to their general practitioner. In 78(88%), the screening protocol provided adequate information for clinical decision making.

**Conclusion:** A 15-minute screening protocol is an efficient tool in asymptomatic heart murmur patients, to separate those with significant cardiac abnormalities from those who can be discharged from further cardiology input. Compared to a similar study performed some years ago, follow up frequency has increased from 20% to 34%, perhaps representing better selection of patients.

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**Sonographers – Are We Still Getting Injured?**

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2 Royal Melbourne Hospital, Melbourne, Australia

**Aim:** In this age of improved ergonomics and increased awareness – sonographers are still getting injured. We aimed
Abstract

Sonographers – Are We Looking After Ourselves?

Michael Cursaro*, Nicole Reid-Smith, Geoff Wong

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2 Royal Melbourne Hospital, Melbourne, Australia

Aim: Echocardiography is a mainstay of cardiac imaging. It is accessible, comprehensive and cost-effective. However, it is also recognised that this investigation is responsible for an increased risk of injury and discomfort to sonographers. There are guidelines for reducing sonographer injuries. We set out to investigate how closely sonographers adhered to these guidelines, in particular individual controls, across Australia and New Zealand.

Method: Following ethics approval, a confidential electronic survey was widely distributed through professional networks across Australia and New Zealand. Sonographers responded to questions relating to “individual controls”, as published in multiple guidelines for sonographer safety.

Results: 1494 sonographers completed the survey, 97% were based in Australia and New Zealand. We found that some recommendations were followed by the vast majority of sonographers, such as optimizing the patient’s position (95%) and optimizing bed/stool height (98%). 77% of sonographers claim to maintain a good level of fitness; however, only 37% stretch on a daily basis.

Conclusion: Some recommendations for sonographer injury prevention have been thoroughly embraced by sonographers in Australia and New Zealand. However, there is still room for improvement. Considering that sonography is a high-risk profession, it is important for staff to be aware of these recommendations and take them on board. These indi-
Table 1. Sonographer adherence to safety recommendations for individual controls.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>YES (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you optimise the patient’s position?</td>
<td>98%</td>
</tr>
<tr>
<td>Do you elevate the bed and table height?</td>
<td>98%</td>
</tr>
<tr>
<td>Do you assess and maintain an adequate level of brightness?</td>
<td>77%</td>
</tr>
<tr>
<td>Do you monitor your patient and an abdomen?</td>
<td>98%</td>
</tr>
<tr>
<td>Do you take regular breaks from scanning?</td>
<td>44%</td>
</tr>
<tr>
<td>Do you stretch your arms?</td>
<td>27%</td>
</tr>
<tr>
<td>Do you intermittently rotate your hand/wrist during procedures?</td>
<td>33%</td>
</tr>
<tr>
<td>Do you intermittently rest your eyes on a distant object during procedure?</td>
<td>9%</td>
</tr>
</tbody>
</table>

Visual controls can be utilized by sonographers regardless of their workplace.

Table 1

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P32

Sonographer Ergonomic Profile in Australia and New Zealand

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Aim: Echocardiography is a sound technique, and retains its position as a mainstay of cardiac imaging. However, it is also linked with an increased risk of injury to sonographers. There are guidelines for reducing sonographer injuries, many relating to administrative controls. These are in the court of the employer. We set out to investigate the ergonomic landscape of sonographer workplaces across Australia and New Zealand.

Method: Following ethics approval, a confidential electronic survey was distributed through professional networks across Australia and New Zealand. Sonographers responded to questions relating to their employment conditions or "administrative controls" for preventing workplace injuries.

Results: Of the 1494 sonographers who completed the survey, 97% were based in Australia and New Zealand. There was a mix of private (61%) and public (39%) employers.

The results indicate that the vast majority of workplaces did not have a policy in place for bariatric patients (93%), nor limiting portable/bedside scans (88%). 78% of sonographers did not have a limit of scans they could perform each day. 73% of sonographers have not had their scanning technique critiqued from an ergonomic perspective. 47% of the rooms were not flexible enough to allow ambidextrous scanning.

Conclusion: Administrative controls to prevent sonographer injury are guided by the employer. The results showed that there was room for improvement in a number of key areas. Employers should be aware of published guidelines to prevent sonographer injury – and consider policies with these recommendations in mind.

Table 1. A summary of administrative controls to prevent sonographer injury.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>YES (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is there a policy for bariatric patients?</td>
<td>7</td>
</tr>
<tr>
<td>Is there a policy for scanning patients on hospital beds?</td>
<td>8</td>
</tr>
<tr>
<td>Is there a policy to limit portable/bedside scans?</td>
<td>32</td>
</tr>
<tr>
<td>Is there a policy to limit the number of scans performed per day?</td>
<td>33</td>
</tr>
<tr>
<td>Are operators helped to position/apply your scanning technique?</td>
<td>77</td>
</tr>
<tr>
<td>Are ergonomic posters displayed to encourage stretching/good posture?</td>
<td>49</td>
</tr>
<tr>
<td>Are the scanning rooms flexible enough to enable right and left handed scanning?</td>
<td>54</td>
</tr>
<tr>
<td>Is there a process for you to document injuries to your employer?</td>
<td>45</td>
</tr>
<tr>
<td>Did you have an information/education session with your employer?</td>
<td>46</td>
</tr>
</tbody>
</table>

http://dx.doi.org/10.1016/j.hlc.2018.05.175

P33

Echocardiography Provision within New Zealand Public Hospitals by Population

Steve White∗, Nick Fisher
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Background: Echocardiography is an essential investigation for cardiology services with its activity directly correlated to cardiothoracic activity morbidity and mortality. Results from the 2013 SCANZ workforce survey identified 1748 echocardiograms performed per 100,000 population. At NMDHB we believe 2351 echoes per 100,000 is a more appropriate ratio. This ratio is based on NMDHB ’14/’15 numbers with the following considerations; access criteria, GP direct access, sonographer led valve clinics, fully staffed no vacancies, no significant waiting times, appropriate triaging, student in training and allocated CME time for sonographers. This ration is still conservative when compared to Australia with a ratio of 3500 echoes per 100,000.

Methods: Using the Ministry of Health DHB website for population statistics, 2017 echo numbers per DHB and applying the NMDHB echo numbers, we are able to quickly determine if the appropriate number of echoes are being performed for a given population. No allowance is made for ethnicity or population age.

Results: The majority of DHB’s are underperforming (see NZ map/graphic).

Conclusion: All sites performed below expected numbers of echoes appropriate to their population. Influencing factors on number of echoes performed have previously been identified as sonographer number and availability, waiting times, equipment availability, appropriate referral criteria, GP access and valve follow up clinics.

Anecdote, waiting lists and ‘feels right’ are clearly not a way of judging the appropriate number of echoes for a given population. No allowance is made for ethnicity or population age.

http://dx.doi.org/10.1016/j.hlc.2018.05.176
Abstract

Structural and Valve Disease

P34

Early Structural Valvular Deterioration of Mitroflow Aortic Valve: The Christchurch Experience

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2 Canterbury District Health Board, Christchurch, New Zealand

Aim: Early structural valvular deterioration (SVD) has been reported in aortic Mitroflow bioprostheses. We aim to assess the incidence and the impact of SVD on outcome in our local series of Mitroflow aortic valve replacement (AVR).

Method: We retrospectively identified 108 patients with Mitroflow AVR implanted in Christchurch Hospital from May 2010 to September 2014. Serial echocardiography assessments were performed for follow up. The incidence of repeat aortic valve intervention and adverse outcome were identified using electronic patient record database.

Results: Seven patients (6.5%) underwent second aortic valve intervention (6 surgical AVR and 1 transcatheter aortic valve implantation). One patient (aged 80) had pseudomonas endocarditis requiring repeat surgery 3 months after the initial procedure. He died 14 months later. Six patients (median age 65, 35 – 80 years) developed early SVD with stenosis - average mean gradient 55 mmHg (33 to 70 mmHg) and peak gradient 89 mmHg (58 to 115 mmHg). One patient with early SVD also had recurrent multiple embolic events. All but one had small valves implanted initially (1x19 mm, 3x21 mm, 1x22 mm and 1x27 mm). The median time to redo AVR was 30.5 months (24 to 39 months) following initial procedure. There were no deaths in this group.

Conclusion: Early SVD requiring further intervention is observed in approximately 6% of patients with Mitroflow AVR in our local series. This is congruent with other case series reported. Small valve size and young patient age may be important contributing factors.

http://dx.doi.org/10.1016/j.hlc.2018.05.177

P35

Percutaneous Atrial Septal Defect Closures in Wellington

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Background: Atrial Septal Defects (ASDs) are a common form of congenital heart disease, often detected in adult life. If left untreated they can lead to right heart failure and pulmonary hypertension. It is widely accepted that indication for closure includes right ventricle (RV) dilatation/impePAIRment, demonstration of a haemodynamically significant shunt or symptoms. In suitable patients, percutaneous closure is an effective and less invasive approach than open surgery.

Method: We retrospectively analysed all patients who had ASDs closed percutaneously in Wellington between February 2011 and January 2018, by reviewing medical records and echocardiograms.

Results: 33 patients underwent attempted percutaneous ASD closure. All were performed under conscious sedation. 23 were female, with an average age of 40 years. All patients had a dilated RV. 17 had objective shunt quantification, all of which were haemodynamically significant. 17 were symptomatic. The majority of closures were performed using an Amplatzer Septal Occluder, with an average size of 25 mm. 3 procedures were unsuccessful and required subsequent surgical closure. Of the 30 completed percutaneously, at 6 month follow up only 9 had ongoing RV dilatation (mild) and all had normal RV function. There was 1 small, non-significant shunt. 2 patients had ongoing symptoms (palpitations). There were few complications with 1 minor bleeding, 2 readmissions and 1 death 9 months later in a patient with significant comorbidity. 2 patients required a second procedure as the first attempt was unsuccessful.

Conclusion: Percutaneous closure of ASDs in Wellington has demonstrated significant improvement in RV size/function, interatrial shunts and symptoms with a low rate of complications.

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P36

Repair Versus Replacement of Isolated Tricuspid Valve Disease: A Meta-Analysis

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Aims: Tricuspid valve surgery is rarely performed in isolation and has high operative risk compared to other single-valve operations. There is sparse literature on the best surgical approach for isolated tricuspid valve disease although guidelines consensus suggests valve repair. We meta-analysed the outcomes of isolated tricuspid valve repair versus replacement.

Methods: Two authors independently searched MEDLINE, Embase, Scopus and Cochrane from January 1980 to December 2017 for studies which report outcomes for both isolated tricuspid valve repair and replacement, and excluding congenital tricuspid valve aetologies. Data were extracted and pooled using random-effects models.

Results: The search yielded 734 articles, with 28 full-texts obtained from abstract screening and 6 observational studies included, totalling 2,465 repairs and 3,271 replacements. Mean age were 52 ± 17 and 55 ± 15 years p = 0.11, and females made up 54% and 60% p = 0.34 respectively. Pooled repair and replacement event rates and odds ratios (95% confidence intervals) for operative mortality was 8% versus 10%, 0.72 (0.60-0.87) in 6 studies, and late mortality 14% versus
Abstract

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Tom Kai Ming Wang1,

S36

Abstract

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http://dx.doi.org/10.1016/j.hlc.2018.05.179

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http://dx.doi.org/10.1016/j.hlc.2018.05.180

http://dx.doi.org/10.1016/j.hlc.2018.05.181

Conclusion: Isolated tricuspid valve repair was associated with significantly reduced operative mortality and trend towards reduction in renal complications and permanent pacemaker implantation, but no differences in longer term outcomes mortality or redo operations. Valvular repair is therefore recommended where feasible for isolated tricuspid disease.

http://dx.doi.org/10.1016/j.hlc.2018.05.179

Comparison of Risk Models at Predicting Outcomes of Isolated Tricuspid Valve Surgery

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2 University of Auckland, Auckland, New Zealand

Aims: Isolated tricuspid valve surgery is considered for patients with severe tricuspid valve disease with symptoms or right ventricular dysfunction, in absence of significant other valve disease. Risk stratification plays an important role for decision-making in cardiac surgery, but has rarely been studied for this high risk cohort. We compared the prognostic utility conventional surgical risk scores for isolated tricuspid valve surgery.

Methods: All patients having isolated tricuspid valve surgery during April 2001 to June 2017 at Auckland City Hospital were reviewed. We retrospectively calculated their logistic EuroSCORE, EuroSCORE II and the novel STS tricuspid surgery additive score, and assessed their performance for mortality and morbidities.

Results: Amongst 54 patient studied with operative mortality of 11% (6), mean ± standard deviation of risk models were: EuroSCORE 7.9 ± 5.2%, EuroSCORE II 3.4 ± 3.2%, STS additive score for mortality 3.6 ± 2.3 and for morbidity 4.6 ± 2.7. None of the scores predicted operative mortality c-statistic (95% confidence interval) of 0.42 (0.22-0.61), 0.58 (0.40-0.77), 0.56 (0.36-0.77) and 0.62 (0.40-0.85) respectively. EuroSCORE II was able to predict long-term mortality 0.74 (0.59-0.89) and acute renal failure 0.68 (0.53-0.83), whereas none of the other scores could detect adverse outcomes. In multivariate analysis, cardiopulmonary bypass time predicted operative mortality, body mass index predicted comorbid morbidity, and diabetes mellitus predicted long-term mortality.

Conclusion: Current surgical risk scores couldn’t predict and underestimated operative mortality after isolated tricuspid surgery, with only the EuroSCORE II predicting some of the adverse outcomes. There is unmet need to developing tricuspid valve surgery-specific risk models with adequate discrimination and good calibration.

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Comparison of Risk Models at Predicting Outcomes of Isolated Tricuspid Valve Surgery

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Aims: Patent foramen ovale (PFO) is a common congenital lesion and significantly associated with cryptogenic stroke. Percutaneous PFO closure in these patients to prevent recurrent neurological events has been controversial for decades, and mixed results have been reported from past and recent observational and randomised studies. This meta-analysis of randomised trials aims to compare the efficacy and safety of PFO closure with medical therapy for cryptogenic stroke patients.

Methods: MEDLINE, Pubmed, Embase, Scopus and Cochrane were searched from January 1980-September 2017 by two authors independently to include original randomised trials comparing PFO closure with medical therapy for secondary stroke prevention. Relevant study characteristics and outcomes were extracted and pooled using random-effects models.

Results: Amongst 619 articles searched, 10 full-texts were assessed after screening and 6 studies reporting 5 randomised trials totalling 1829 PFO closure and 1611 medical therapy patients were included. Pooled hazards ratios (95% confidence interval, P-value) of ischaemic stroke, transient ischemic attack and composite neurovascular or mortality events were 0.41 (0.19-0.89, P = 0.02), 0.71 (0.48-1.04, P = 0.08) and 0.60 (0.42-0.85, P = 0.004) for PFO closure compared to medical therapy. Any adverse events, major bleeding and all-cause mortality were similar between modalities (p = 0.375-0.95), however PFO closure had higher rates of new onset atrial fibrillation at 4.6 (2.0-10.5, P < 0.001).

Conclusion: Our meta-analysis found that in patients with cryptogenic stroke, percutaneous PFO closure is beneficial at reducing ischemic stroke and composite neurovascular or mortality events, with a higher incidence of new atrial fibrillation, compared to medical therapy.

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Abstract

To review Nursing Council professional requirements of the NE and NS roles
i) To look closely at the job descriptions of other Specialty Nurse Positions in Waitemata and Counties Manukau DHBs as these were guiding documents in our process
ii) To see how these job descriptions were deployed to reflect MAU requirements for this senior nurse position
iii) To consider how other labs may adjust this role to fit their individual requirements

Results: MAU appears to be the only cath lab in New Zealand using this role: A questionnaire will be generated to test the understanding of the clinical team members as to what this role entails and how it benefits the team. This will be available as part of this presentation.

Conclusion: Senior nursing roles within the Cath Lab are quite restricted due to the smallness of each individual team and how these units do not often fit into standardized professional development programmes. This role is an opportunity to provide a cath lab professional development pathway within the Cath Lab while at the same time not losing the clinical skills of the nurse to areas outside the Unit.

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P41

The Radial Lounge: Delivering Peri-procedural Care in a Different Way (Recliner Chair Recovery, Less or No Sedation, Less Clinical Oversight and, Mostly, Keeping Patients in Their Street Clothes)

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Aim: To look at the concept, the experiences of two Auckland Cath Labs and thoughts on developing this concept to replicate what happens elsewhere in the World.

Method: An overview of where this concept originated; a look at the Pilot Study from the Auckland City Hospital Cardiac Investigations Unit with results; how this was instigated at Mercy Hospital, Auckland; - also with trial results - and thoughts on moving from the present state of play to replicate what is delivered elsewhere in the World.

Results: The concept is supported strongly by both patients and staff with certain reservations. Some of these reservations may be a block to replicate what happens elsewhere.

Conclusion: This is a safe option for delivering care to a certain cohort of patients requiring coronary angiography and stenting.

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**Abstract**

which has reinforced its implementation.

We investigated areas of efficacy and timeliness. We were particularly interested in how our patients felt about the whole trajectory of care.

Method: This study used a qualitative design that retrospectively interviewed patients who underwent elective CV during the period of March 2017 to March 2018. A phenomenological method was used to gather the data and evaluate the patient experience.

An audit was also performed to compare the time from referral to treatment, the anticoagulate chosen, the procedural sedation used and result of the procedure. Results: The study found that the experiences recounted by the patients were overall positive and the implementation of the pathway was successful. There was an increase in consistency of care, patient satisfaction, follow up and information provided.

The audit found that there was a greater proportion of patients on dabigatran compared to warfarin, less sedation used and reduced referral to treatment time.

Conclusion: The new CV pathway has been shown to provide consistent patient care with positive patient experiences, which has reinforced its implementation.

AF patients can now rely on a pathway from GP to Cardiology specialist without long delays and added discomfort, anxiety and risk.

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**Rehabilitation/Prevention**

**P43**

A Text/Email Messaging Service for Cardiac Rehabilitation

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Aim: The purpose of this study was to analyse the experiences of patients in atrial fibrillation (AF) undergoing elective cardioversions (CV).

We have evaluated the nurse facilitated, patient centered pathway one year after implementation.

We investigated areas of efficacy and timeliness. We were particularly interested in how our patients felt about the whole trajectory of care.

Method: This study used a qualitative design that retrospectively interviewed patients who underwent elective CV during the period of March 2017 to March 2018. A phenomenological method was used to gather the data and evaluate the patient experience.

An audit was also performed to compare the time from referral to treatment, the anticoagulate chosen, the procedural sedation used and result of the procedure. Results: The study found that the experiences recounted by the patients were overall positive and the implementation of the pathway was successful. There was an increase in consistency of care, patient satisfaction, follow up and information provided.

The audit found that there was a greater proportion of patients on dabigatran compared to warfarin, less sedation used and reduced referral to treatment time.

Conclusion: The new CV pathway has been shown to provide consistent patient care with positive patient experiences, which has reinforced its implementation.

AF patients can now rely on a pathway from GP to Cardiology specialist without long delays and added discomfort, anxiety and risk.

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**P44**

A Snapshot of Cardiac Rehabilitation Nursing Resource in New Zealand in 2018

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Aim: To describe the current state of cardiac rehabilitation (CR) nurse staffing resource at DHBs across New Zealand.

Method: A questionnaire was developed and sent to all CR providers at DHBs within New Zealand. The questionnaire assesses the number of patients eligible for CR, programs offered and staffing resource.

Results: 18 (95%) of DHBs responded to the survey, 1 non responder from a small DHB where a CR nurse provider could not be found. The mean number of patients eligible for CR is 725 ± 426 patients per year at each DHB. One nurse manages an average of 569 ± 263 patients per year (range 227 to 1250 patients/nurse). 4 DHBs only have cardiac specialty nurses and there are no CR nurse practitioners in New Zealand. 70% of responders felt that more nurse FTE was needed for CR at their DHB.

Only 1 DHB does not offer Phase 1 CR education. All other DHBs offer phase 1 CR with 55% undertaken by CR nurses alone, 28% a mixture of ward staff and CR nurses and 12%...
by wards staff only. 72% offered community based phase 2 programs and 55% offered home visits.

**Conclusion:** There is a large disparity in CR nurse resource across DHBs and most nurses feel under resourced. This disparity in resource impacts the service offered to patients dependent on geography.

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**P45**

**The Benefits of Early Post Cardiac Surgery Recovery Program for Tahitian Patients**

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**Aim:** To explore the benefits of early post-operative cardiac rehabilitation (CR) for Tahitian patients.

**Method:** Audit of 50 Tahitian patients from Feb 2017-2018 who received early post-operative CR program at ADHB. 62% of the Tahitian patients had their nurse specialist and physiotherapist assessment within 1-3 days post hospital discharge and 50% of the patients were assessed in ≤10 days post cardiac surgery. This was Non-Tahitian cardiac patients are seen two weeks post discharge and have to wait for at least 6-8 weeks for physiotherapy assessment.

**Results:** Complications noted during the physiotherapy/nursing assessments included: musculoskeletal complications (12%), wound complications (8%), cardiac and respiratory (10%), suboptimal diabetic control (2%) and multiple issues (>2 issues or true complications) (24%). 62% of the patients still completed the exercise program; however, the remaining 38% had multiple reasons for non-completion: early return to Tahiti (8%), multiple medical complications (12%), cardiac and respiratory complications (6%), musculoskeletal complications (6%), wound infection (4%) and suboptimal diabetic control (2%). No complications were seen in 42%.

**Conclusion:** Assessment and rehabilitation within one to two weeks after discharge from cardiac surgery is beneficial for patients as it allows the multidisciplinary team to diagnose and address complications. However, this is a special cohort and there is no other cardiac rehabilitation program in NZ with which to compare our data.

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