Primary Care Echocardiography Service Audit

Dr Natalie Reid MBChB PGDipOMG PGDipCH

Introduction

Cardiovascular disease continues to be the leading cause of death in New Zealand. Taranaki has a higher than national average rate of cardiovascular disease, and cardiovascular disease is the leading cause of patients admitted through ED. (Ministry of Health, 2015). The 2016-2017 New Zealand Heart Survey identified that around 186,000 New Zealanders had been diagnosed with Heart Failure an increase of 8% from the previous year. (Ministry of Health 2018)

Echocardiography is an essential part of the management of cardiac disease and nationally there is a huge demand for this resource, and a health system that falls dramatically short of meeting this.

In 2021, Fast Pace Solutions was successful in obtaining a Ministry of Health Telehealth Initiative funding to provide diagnostic testing directly to Primary Care. This led to high level diagnostic equipment being placed or made available at Opunake Medical Centre.

Ōpunake Medical Centre is Rural General Practice located in Ōpunake, 50 minutes south of New Plymouth. The practice has 3950 enrolled patients. Ōpunake Medical Centre is a Very Low Cost Access practice, which reflects the high need and complexity of its patients.

There are many barriers to the patients of Ōpunake requiring Echocardiograms (ECHOs), including location of the resource and a limited resource. Patients requiring ECHOs are required to travel through to New Plymouth, either privately at the patient's cost, or through the public system. The wait-times for Public ECHOs in Taranaki are extremely long with most patients being declined one when ordered by a GP.

Aim

This pilot was run to look at the outcomes when pre-emptive, high quality diagnostic testing was made readily available to a rural community.

Hypothesis

The hypothesis was that this will lead to more, and earlier, diagnoses of significant cardiac complications or conditions amongst those with chronic medical conditions or at higher risk whilst improving equity and health outcomes in a rural community.

Method

The patients were enrolled in Ōpunake Medical Centre. They required a GP referral with an indication that fit the criteria of the study as seen in Table 1. The patients need to identify as Māori or Pacific in ethnicity, and/or live in an area with a deprivation index of >6.

Echocardiogram Indication Guidelines
1. Known or suspected Ischaemic Heart Disease
2. Arrythmia or Syncope
3. Hypertension
4. Pulmonary disease with suspicion of cardiac involvement
5. Cardiomyopathy
6. Heart Murmer - non-innocent
7. Native Valvular Regurgitation
8. Native Valvular Stenosis
9. Prosthetic valve assessment
10. Infective Endocarditis
11. Pericardial disease
12. Cardiac Masses
13. Neurological Disease
14. Prior to Cardioversion
15. Aortic or Major Arterial Disease
16. Pre-operative

Table 1. Indications for Referral for Echocardiography

The service was provided by a private echocardiographer who held multiple clinics using the rooms at the Opunake Medical Centre. The echocardiographer produced a report and this was reviewed and finalised by the Cardiologist, utilising HeartLab cloud Software, who was able to give clinical advice back to the referrer. Ōpunake Medical Centre was then responsible for informing the patient and performing ongoing clinical assessment and intervention.

Background information was retrieved from the patient's file on Medtech through the Ōpunake Medical Centre. The information regarding the ECHOs was sourced through Fast Pace Solutions.

Findings

The pilot started in March 2021 until March 2023. The pilot included 24 patients, with 16 Males and 8 Females. There were 10 patients who identified as Māori and 12 as New Zealand European. The majority of patients were aged between 40 and 79 yrs. All patients were in a Deprivation index area >6.

Gender	Male	16 (66%)
	Female	8 (33%)
	Total	24 (100%)
Age	10 - 19 yrs	1 (4%)
	20 - 29 yrs	1 (4%)
	30 - 39 yrs	2 (8%)

	40 - 49 yrs	3 (13%)
	50 - 59 yrs	6 (25%)
	60 - 69 yrs	7 (29%)
	70 - 79 yrs	4 (17%)
	Total	24 (100%)
Ethnicity	Maori	10 (42%)
	NZ European	12 (50%)
	Unknown	2 (8%)
	Total	24 (100%)
Number of Medical Conditions	0 - 3 conditions	7 (29%)
	4 - 7 conditions	9 (38%)
	8+ conditions	6 (25%)
	Unknown	2 (8%)
	Total	24 (100%)

Table 2. Demographics of patients in study

As outlined in Table 3, the most common indication for an ECHO was for chronic conditions monitoring. The Echocardiogram showed significant abnormalities in 46% of patients and that was a new diagnosis in 80% of those patients. The management of the patient was altered in 38% of patients who received an ECHO.

Indication	Abnormal Exam	3 (13%)
	Chronic Condition/s	16 (66%)
	Symptoms	4 (17%)
	Pre-operative	1 (4%)
	Total	24 (100%)
Outcome of Echocardiogram	Abnormal	11 (46%)
	Normal	13 (54%)
	Total	24 (100%)
New Diagnosis	Yes	9 (38%)
	No	11 (46%)
	Progression of known disease	2 (8%)
	Unknown	2 (8%)
	Total	24 (100%)
Management altered	Yes	9 (38%)
	No	13 (54%)
	Unknown	2 (8%)
	Total	24 (100%)

Table 3. Indications and outcomes of Echocardiograms ordered.

Conclusions

This audit found that targeted Echocardiograms in a higher risk population, including Māori peoples, diagnosed a significant amount of abnormalities in patients and lead to changes in their management plans. The majority of these patients would not have had an ECHO if this pilot study was not implemented.

This audit shows that providing pre-emptive care to those more at risk of cardiac disease can help guide better management of their health.

During the pilot the Echocardiographic studies were carried out within the medical facility by a mobile echo service removing the requirement to travel to the Secondary Care Facility. Normally referral to the Secondary Service would require 1 return trips(49 km one way) which saved over 2,352 kilometres of travel which equates to 94 minutes (1 hour 34 minutes) of travel time per patient ; a total travel time of 2,256 minutes (37 hours 6 minutes).

Using a calculation for a medium petrol vehicle (1.4L – 2.0L) This would be expected to have saved in excess of 441.82 $kgCO_2e$ *

This excludes any travel for Specialist follow up.

General Practitioners Comment; *"I think possibly the least helpful. Maybe due to the randomness of the appointments. Also, maybe because ECHOs aren't something we usually order so less clear of when needed maybe? I think maybe if it was a regular thing then we would upskill in ie indications of when to use Entresto? Might be better if it was directed by secondary care? "*

- https://blocicarbon.com/vehicle-calculator/

References

Ministry of Health (2015) Mortality and Demographic data 2013 (provisional). Wellington: Ministry of Health. https://www.health.govt.nz/

Ministry of Health (2018) NZ Health Survey: Annual update of key results 2016-2017. Wellington: Ministry of Health. https://www.health.govt.nz/