

Primary Care Holter Monitor 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).

Holter Monitors are an essential part of diagnosis and management of cardiac disease, namely arrhythmias. Nationally there is a huge demand for this resource, which is not met by the health system. Holter monitors are generally attached to the patient for 48 hours and measure the patient's heart rate and rhythm. The patient can record any symptoms which can then be linked to the associated rhythm and rate.

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 Ōpunake 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.

Patients of the Ōpunake Medical Centre can choose to travel, twice, to New Plymouth for a funded Holter Monitor through the hospital with a significant delay of many months to having the test completed. A timelier private option is also available in New Plymouth, however, still requires two separate trips to and from New Plymouth as well as the added cost of the test.

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 arrhythmias in those with symptoms or chronic medical conditions which put them at a higher risk. This in turn would lead to improved health management and outcomes whilst improving equity of access.

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.

Indications

Abnormal ECG

Abnormal Examination

Chronic Medication Condition/s

Family History of Arrhythmias

Symptoms ie palpitations, chest pain, shortness of breath, dizziness, syncope

Table 1. Indications for referral for Holter Monitor

The service was provided by the staff at the Ōpunake Medical Centre which included fitting the holter monitor and removing it 48 hrs later. The holter monitor data was sent electronically to Fast Pace Solutions, via a secure Cloud network, to be reviewed and finalised by the Cardiologist who was able to give clinical advice/management recommendations 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 ECGs was sourced through Fast Pace Solutions.

Findings

The pilot was carried out over 2 years, starting in 2021. The pilot, as shown in table 2, included 70 patients, 27 Males and 43 Females. There was a large age spread, however the majority of patients were between 40 and 79 yrs. There were 42 patients who identified as NZ European and 23 who identified as Māori. All patients were in a Deprivation index area >6.

Gender	Male	27 (39%)
	Female	43 (61%)
	Total	70 (100%)
Age	10 - 19 yrs	2 (3%)
	20 - 29 yrs	5 (7%)
	30 - 39 yrs	6 (9%)
	40 - 49 yrs	9 (13%)
	50 - 59 yrs	22 (31%)
	60 - 69 yrs	10 (14%)
	70 - 79 yrs	13 (19%)
	80 - 89 yrs	3 (4%)
	Total	70 (100%)
Ethnicity	Maori	23 (33%)
	NZ European	42 (60%)
	Samoan	1 (1%)
	Other European	2 (3%)
	Other Asian	2 (3%)
	Total	70 (100%)
Number of Medical Conditions	0 - 3	26 (37%)
	4 - 7	28 (40%)
	8 - 11	14 (20%)
	12 +	2 (3%)
	Total	70 (100%)

Table 2. Demographics of Patients in Pilot

Outlined in Table 3., the most common indication for a Holter Monitor referral was symptoms, most notably chest pain or palpitations. Monitoring of chronic conditions was the second most common indication. Overall, 20% of patients had a new diagnosis made. Management was altered in 14% of patients who had a Holter Monitor.

Indication	Abnormal ECG	3 (4%)
	Abnormal Examination	3 (4%)
	Chronic Condition/s	19 (28%)
	Family History of Arrhythmias	1 (1%)
	Symptoms	44 (63%)
	Total	70 (100%)
New Diagnosis	Yes - Frequent ectopy	4 (6%)
	Yes - Sinus Bradycardia	2 (3%)
	Yes - Sinus Tachycardia	5 (7%)
	Yes - Arrhythmia (Long QT, Atrial Fibrillation)	3 (4%)
	No	56 (80%)
	Total	70 (100%)
Management altered	Yes - Medications altered	1 (1%)
	Yes - Further investigations requested	6 (9%)
	Yes - Referred to Specialist	3 (4%)
	No	60 (86%)
	Total	70 (100%)

Table 3. Indication for and Findings of Holter Monitors ordered.

Table 4. shows the indication for referral in those patients who had a holter monitor which changed their management. This shows that symptoms were the indication in half of these patients. Chronic medical condition/s monitoring was the indication in 40% of patients.

Indication	
Abnormal ECG	0 (0%)
Abnormal Examination	1 (1%)
Chronic Medication Condition/s	4 (40%)
Family History of Arrhythmias	0 (0%)
Symptoms	5 (50%)
Total	10 (100%)

Table 4. Indication for referral for Holter Monitor in those who had management altered.

Table 5. shows the outcomes of Holter Monitors where Chronic Condition/s monitoring was the indication for referral. 21% of patients had a change in their management despite having no symptoms.

Outcome	
Medications altered	1 (5%)
Further investigations requested	1 (5%)
Referred to Specialist	2 (11%)
No Change	15 (79%)
Total	19 (100%)

Table 5. Outcome of Holter Monitors where indication for referral was Chronic Condition/s monitoring.

Conclusion

The largest indication for holter monitor referrals was for symptoms. For the GPs of Ōpunake Medical Centre it was such a valuable resource to have to investigate their patient's complaint in a timely and fiscally acceptable way.

The patient's management was changed in a significant number of cases (14% of total holter monitors).

19 patients had a holter monitor to monitor their chronic condition/s and a significant amount of those then had their management altered (21%). These patients would not have been investigated at all if this audit had not been carried out.

This audit shows that placing holter monitors into rural communities leads to more, and likely earlier, diagnoses of significant cardiac arrhythmias and more importantly leads to changes in patient's health management.

During the pilot the holters were carried out within the medical facility removing the requirement to travel to the Secondary Care Facility. Normally referral to the Secondary Service would require 2 return trips(49 km one way) which saved over 17,164 kilometres of travel which equates to 196 minutes (3 hours 27 minutes) of travel time per patient ; a total travel time of 13,720 minutes (228 hours).

Using a calculation for a medium petrol vehicle (1.4L – 2.0L) This would be expected to save in excess of 3,224.26 kgCO₂e * **This excluded any travel for Specialist follow up.**

General Practitioners comment: *“handy to have such good access when patients present with symptoms. Mostly people just wouldn't have them due to travel and cost unless highly motivated (and they're not usually the patients you want capture).”*

*<https://blocicarbon.com/vehicle-calculator/>