Cardiovascular risk assessment: Audit findings from a nurse clinic—an a quality improvement initiative

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ABSTRACT


METHOD: A retrospective audit of CVD risk assessment with data for the first entry of 621 patients collected exclusively from PREDICT-CVDTM, along with subsequent data collected from 320 of these patients who had a subsequent assessment recorded at an interval ranging from six months to three years (18 month average).

RESULTS: Of the eligible population (71%) with an initial CVD risk assessment, 430 (69.2%) had a five-year absolute risk less than 15%, with 84 (13.5%) having a risk greater than 15% and having not had a cardiovascular event. Of the patients with a follow-up CVD risk assessment, 34 showed improvement. Medication prescribing for patients with absolute CVD risk greater than 15% increased from 71% to 86% for anti-platelet medication and for lipid lowering medication from 65% to 72% in the audit period.

STRATEGIES FOR IMPROVEMENT: The recently available 'heart health' trajectory tool will help patients become more aware of risks that are modifiable, together with community support to engage more patients in the nurse CVD prevention programme. Further medication audits to monitor prescribing trends.

LESSONS: Patients who showed an improvement in CVD risk had an improvement in one or more modifiable risk factors and became actively involved in making changes to their health.

KEYWORDS: Cardiovascular disease risk assessment; nurse clinics; audit

Background

Cardiovascular disease (CVD) is the leading cause of death in New Zealand (NZ). The burden of this disease falls disproportionately on Maori, Pacific people, people from the Indian subcontinent and lower socioeconomic groups.1

Evidence from extensive population studies and clinical trials have shown the effectiveness of risk factor management in reducing mortality and morbidity from cardiovascular disease and Type 2 diabetes.2-4 National and international guidelines have been generated; however current practices have been shown to often fall short of attaining the goals recommended in national guidelines.1

The NZ CVD guidelines1 estimate that 55% of future CVD events could be prevented with CVD risk assessment and management if carried out comprehensively and could provide considerable health benefits for many people in a relatively short period of time.5 A NZ study, however, demon-
strated that more than two-thirds of people in primary care with vascular disease were not receiving guideline-recommended medication. Similarly, in secondary care, risk factor management for CVD has been shown to be sub-optimal in a significant percentage of secondary prevention patients.\(^7\)

There is increasing evidence that nurse clinics are an effective way to improve management across the cardiovascular disease continuum\(^6\) and, in New Zealand, nurses have been shown to successfully implement systematic CVD risk assessment programmes.\(^9\)–\(^11\)

This paper reports an audit evaluating the progress of a nurse cardiovascular risk assessment programme, through examination of the cardiovascular disease (CVD) risk profile of an enrolled general practice population and subsequent CVD risk management.

**Context**

The audit was completed in a Northland general practice with an enrolled practice population of 2272. The practice has two general practitioners, both of whom work part-time, one full-time practice nurse and two part-time reception/practice management staff. In 2005 the practice nurse developed and implemented a CVD risk assessment programme, evaluating progress through an audit completed in 2008.

The population eligible in 2005 for CVD screening in accordance with the cardiovascular risk guidelines\(^1\) included 880 people:

- Maori/Pacific Island Female >45yrs = 62 (7%)
- Maori/Pacific Island Male >35yrs = 74 (8%)
- Non-Maori/Pacific Island Female >55 yrs = 354 (40%)
- Non-Maori/Pacific Island Male >45 yrs = 390 (45%).

With the support of the Te Tai Tokerau PHO and the use of the electronic clinical decision support tool PREDICT-CVDTM, the practice undertook to provide CVD screening for its eligible patients at no charge to the patients. Letters were sent with a laboratory form for fasting blood tests (glucose and lipids). Some patients responded to the letters and made appointments for a ‘CVD screen’, others were offered the assessment opportunistically when they visited the practice for other reasons.

**Method**

A retrospective audit with data collected exclusively from PREDICT-CVDTM was undertaken. Data were obtained from the first entry for the patient along with subsequent data collected from a later patient consultation where this was available.

The audit questions were in two groups:

1. **CVD risk profile of enrolled population**
   - What percentage of the eligible population (880 people) had a CVD risk assessment recorded (in accordance with the cardiovascular risk guidelines)?
   - What was the overall CVD risk profile of this population group?

2. **CVD risk management and change to risk profile and management over time**
   - What was the risk profile of the population subsequent to lifestyle modification advice and support and clinical management (evaluated at baseline and at subsequent risk assessment where these data were available)?
   - What percentage of people with a five-year CVD risk greater than 15% were receiving appropriate management (evaluated at baseline and at subsequent risk assessment where these data were available)?

Patients had a CVD risk assessment completed by the nurse between November 2005 and Decem-

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**WHAT GAP THIS FILLS**

**What we already know:** This paper reports the result of an audit of CVD risk assessment in a general practice nurse clinic. While there is considerable emphasis both practically and in the literature for nurse clinics to support CVD risk reduction, there is limited reporting on audits demonstrating what can be achieved through a nurse clinic.

**What this study adds:** The audit findings indicate that while a systematic approach to CVD risk assessment can be successfully implemented in general practice through a nurse clinic, achieving risk reduction cannot be so easily demonstrated. Reasons for this are discussed.
Table 1. Initial CVD risk assessment

<table>
<thead>
<tr>
<th>Absolute CVD risk (%)</th>
<th>All</th>
<th>Non-diabetic</th>
<th>Diabetic</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2.5</td>
<td>11% (67/621)</td>
<td>12% (67/559)</td>
<td>0.0% (0/62)</td>
</tr>
<tr>
<td>2.5–5</td>
<td>13% (79/621)</td>
<td>14% (79/559)</td>
<td>0.0% (0/62)</td>
</tr>
<tr>
<td>5–10</td>
<td>30% (184/621)</td>
<td>32% (179/559)</td>
<td>8% (5/62)</td>
</tr>
<tr>
<td>10–15</td>
<td>16% (100/621)</td>
<td>16% (88/559)</td>
<td>19% (12/62)</td>
</tr>
<tr>
<td>15–20</td>
<td>9% (55/621)</td>
<td>8% (44/559)</td>
<td>18% (11/62)</td>
</tr>
<tr>
<td>20–25</td>
<td>3% (18/621)</td>
<td>2% (10/559)</td>
<td>13% (8/62)</td>
</tr>
<tr>
<td>25–30</td>
<td>1% (7/621)</td>
<td>1% (5/559)</td>
<td>3% (2/62)</td>
</tr>
<tr>
<td>&gt;30</td>
<td>0.6% (4/621)</td>
<td>0.4% (2/559)</td>
<td>3% (2/62)</td>
</tr>
<tr>
<td>Clinically high</td>
<td>17% (107/621)</td>
<td>15% (85/559)</td>
<td>36% (22/62)</td>
</tr>
</tbody>
</table>

Figure 1. CVD risk of Clinical Audit Group at baseline and follow-up

Results

1. CVD risk assessment: Enrolled population

Six hundred and twenty-one (71%) of the 880 ‘eligible’ population had a CVD risk assessment completed (Table 1). Of this group 84 patients (13.5%) had an absolute five-year CVD risk greater than 15% but had not had a cardiovascular event and 107 (17%) had already had a cardiovascular event. In this latter group 78% were over the age of 60 years.

The majority of the group were European (526 or 85%) and of these 43 (8%) were diabetic. There were 83 (13%) Maori of whom 14 (17%) were diabetic. All other ethnicities had fewer than five people screened, reflecting the enrolled population. Males comprised 53.5% (332) of the risk assessed group. Risk assessment was first offered to all patients known to have had a previous cardiovascular event, to be diabetic, Maori, Pacific or from the Indian subcontinent.

2. CVD risk assessment: Baseline and follow-up

The absolute five-year CVD risk of a group of 320 patients who had a subsequent assessment recorded at an interval ranging from six months to three years (18-month average) was available for comparison with their first screening (Figure 1). This group included patients who were enrolled on Care Plus and/or had shown a willingness to make changes to their lifestyle and improve their CVD risk.

At follow-up there was an increase in the number of patients with diabetes; 16% (51/320) of patients at baseline compared with 19% (62/320) at follow-up and four additional patients were recorded as having a cardiovascular event.

Data to allow consideration of management and of changes in modifiable risk factors were examined in the follow-up group.

Smoking: There was a small decrease in the number of smokers with no new smokers. Maori comprised the biggest number of current smokers at baseline (42/58) and at follow-up (38/54).

Overweight: There was evidence of weight loss, with more people in the BMI range 20–25 and 25–30 and fewer people in the BMI range >30 at follow-up.

Cholesterol: The average total cholesterol/HDL ratio from baseline to follow-up was greater at
follow-up for those patients with a CVD event or diabetes alone. For those with both CVD and diabetes there was a significant improvement in the ratio at follow-up, with the mean reducing from 6.6mmol/L to 3.7mmol/L (Figure 2).

**Blood pressure:** Patients with a decrease or increase in systolic blood pressure of 30mmHg at follow-up from baseline were selected for analysis. A sample of data from such patients is presented in Table 2 with factors that have contributed to a change in systolic blood pressure.

**Physical activity:** A small increase in the number of people who consider themselves physically active was seen.

**Medications:** Medications monitored were anti-platelet/anticoagulants, lipid lowering, blood pressure lowering and included patients on all three medications. Medications prescribed at first screening were compared to the prescribed medications at second screening for two groups. The first group were those with absolute five-year CVD risk assessment >15% (Table 3) and the second group had a clinically high risk of CVD (Table 4) as they had a previous cardiovascular event.

### Key lessons learned

General practice with an enrolled patient population provides a base for systematic population screening. CVD risk assessment for 71% of the eligible population in an 18-month period was achieved through the systematic targeting of those most at risk and by offering a ‘free’ CVD screening appointment with the nurse. This included 65% of the eligible Maori and Pacific population. While not all high-risk Maori and Pacific patients were reached, the number is encouraging and helps identify the target groups for continuation of the programme.

The percentage of patients (31%) at initial screening with a five-year CVD risk greater than 15% is in excess of previous estimates that one in every five individuals would meet criteria for drug treatment. This can be partly explained as the population targeted for initial screening were at ‘high risk’ and were over the age of 60 years (reflecting the practice population and its geographical location).

The audit demonstrated that, for patients with a follow-up risk assessment, improvement was seen in CVD risk factors, for example weight loss and compliance with medication resulting in improvements in blood pressure and serum lipids. There were also improvements in reported levels of physical activity and more patients

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**Figure 2. Total cholesterol/HDL ratio at baseline and follow up**

**Table 2. Sample of patients with a decrease or increase in systolic blood pressure of 30mmHg or more from baseline**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Increase or decrease in systolic blood pressure</th>
<th>Factors that have contributed to change in systolic blood pressure</th>
</tr>
</thead>
</table>
| Patient 1 | -30mm Hg | Medication—β-blocker  
Medication—ACE inhibitor  
Weight loss 19kg  
Dietary improvement  
Improved cholesterol  
Improved HbA1c |
| Patient 2 | -35mm Hg | Exercise  
Dietary improvement  
Improved cholesterol |
| Patient 3 | -30mm Hg | Medication—ACE inhibitor  
Weight loss 7kg |
| Patient 4 | +35mm Hg | Smoking continued  
Age  
Diet not improved  
Cholesterol elevated  
Unwilling to take medication |
| Patient 5 | +32mm Hg | Cholesterol elevated  
BMI unchanged 30.4 |
| Patient 6 | +32.5mm Hg | Increase weight 5kg  
Cholesterol elevated  
Medication—ACE inhibitor |
engaging in an attempt to quit smoking. While follow-up data were available for only 53% of patients who had an initial and subsequent screen, the improvement in reduction of risk factors is encouraging. The role of the nurse is one of the key factors in the programme, with the GPs often lacking time to engage patients in behavioural counselling and CVD risk reduction education. The nurse is well-integrated within the practice and informal consultation between the nurse and the GPs and other practice staff occurs daily. Both GPs in the practice now refer patients to the nurse, and the patients readily accept counselling from the nurse. The nurse consultation notes are part of the patient’s clinical record assisting in continuity of care and integration of lifestyle advice alongside pharmacological management. Having an electronic tool that allows improvement to be demonstrated is encouraging for patients.

There were only 34 people in the group of 320 with a second CVD risk assessment with an improved five-year CVD risk at follow-up. These were patients who actively wanted to make improvements to their health with modification of more than one of the independent risk factors.

Age is one of the considerations in a risk assessment. Because all patients were older at the second assessment, the increase in their CVD risk is partially explained by increase in age. Those who had no change in their CVD risk despite being older at the second screening, were found to have improvement in other risk factors such as BMI, blood pressure or lipids; thus CVD risk remained static despite their increasing age.

The patients who were found to have a significantly increased risk of CVD on the second screening had a poorer result in more than one of the major independent risk factors.

The patients who had increased from a moderate to high risk assessment had a significant cardiovascular event since their first assessment. Three of these patients were aged 70 years or over; all of these individuals had diabetes; two patients in their early 70s were also smokers. The youngest among them was 60 years but had significant risk factors: Maori, a heavy smoker, obese, hypertension and hyperlipidaemia.

The biomedical target which showed the greatest improvement was the total cholesterol/HDL ratio for patients with CVD and diabetes. Many of this group are engaged in Care Plus with regular monitoring of health status, with the general practitioner making changes to medications alongside lifestyle advice and counselling from the nurse.

The results of the audit showed a decrease in smoking of 1.25% which corresponds with Stead, Bergson and Lancaster who concluded that, with quit smoking advice and quit smoking aids, the chance of success in stopping smoking is between 1% and 3%. A higher incidence of smoking among Maori was seen with 38% of the Maori people still smoking at follow-up, compared with 16% of the NZ European people.
The data showed a 3.4% increase in patients with diabetes from baseline to follow-up. This was most likely due to patients being unaware of their diabetic status at baseline. The practice had better Read coding of disease classification by the time of follow-up and a more accurate picture of the patient population was achieved.

The follow-up data showed an increase in the prescribing of all groups of ‘heart’ medication. The greatest increase was with anti-platelet medication in the group with clinically high risk. The reason for the increase is likely to be due to PHARMAC subsiding enteric-coated aspirin as, previously, patients may have purchased this medication. The increase in prescribing of statin medication for patients also corresponds with PHARMAC increasing eligibility for this medication.

Strategies for quality improvement

To improve CVD risk assessment overall, a system of alerts or reminders in the practice management system would facilitate identification of patients for risk assessment and improve opportunistic assessment. Attention to disease coding would also improve identification of ‘at risk’ patients.

While the follow-up data are encouraging for CVD risk reduction they also demonstrated that lifestyle changes and management of people with >15% absolute CVD risk who had not had a previous cardiovascular event could be further improved. The first challenge with many of these patients is making them aware of the significance of their risk and that their risk is modifiable. The recent addition of a ‘heart health’ forecast trajectory tool will enable this to be graphically demonstrated. The next challenge is further engaging these patients in the nurse-led CVD prevention programme. Community awareness and initiatives planned with community support are proposed.

In addition, the follow-up data demonstrated that prescribing patterns for the three Guideline\(^1\) indicated therapies for high risk individuals increased with CVD risk assessment and was higher than in the Rafter study\(^6\) but that further improvement could be achieved. Further audits are planned.

References


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COMPETING INTERESTS

None declared.