Delivering improved chronic disease outcomes in primary care:

An affordable, achievable and sustainable pragmatic approach for primary care – The Foundation Program

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ABSTRACT

Objective

The development and validation of an innovative, affordable approach for delivering improved chronic disease outcomes – The Foundation Program.

Participants

A single group practice primary care team servicing 6800 enrolled patients.

Methods

The Foundation Program was developed in a primary care setting in the Wairarapa based on the principles and strategies successfully employed in the UK to deliver improved chronic disease outcomes and CVD risk-management for patients. It has been adapted to the New Zealand health care culture and funding streams and aims to provide a pragmatic, affordable, achievable and sustainable approach to delivering improved health care outcomes.

Using principles similar to those applied in the UK's PACE (Promoting Action on Clinical Effectiveness) programme, The Foundation Program takes a practice through the key steps necessary for the structuring, organisation and delivery of quality chronic disease management.

The creation and validation of disease registers, 'rules of the road' for data entry, clinical performance reporting and the application of succinct, primary care-orientated, evidence-based clinical guidelines are coupled with innovative IT tools developed within the practice. These tools are used with MedTech-32 PMS (under the auspices of MedTech) to validate disease registers. These registers are fundamental to the accurate recall of patients with chronic disease. The tools also facilitate data harvesting, the targeting of sub-populations within the practice population, CVD risk assessment and the auditing of chronic disease management outcomes.

It also provides the tools for ensuring maximisation of Care Plus funding and PHO target-based performance payments funding the innovative patient-centred, nurse-led, chronic disease management services that are a key component of The Foundation Program.

Results

Six months from commencement, chronic disease registers were able to approach national estimates of prevalence. These were utilised to identify patients eligible for Care Plus funding. The registers were used to improve flu vaccination uptake, significantly increase 'Get Checked' diabetes annual reviews, achieve PHO CPI targets and to improve evidence-based quality outcomes measures for patients with hypertension, diabetes, and cardiovascular disease. In addition, they provided primary prevention CVD risk-assessment for the potential high-risk groups as defined by the New Zealand Guidelines Group. This enables high-risk individuals to be identified and their CVD risk reduced with appropriate lifestyle and therapeutic interventions.

Conclusion and implications

The Foundation Program delivered improved chronic disease outcomes and primary CVD risk-management for patients in an affordable and achievable way within a primary care setting.[1,2]

Background

Management of chronic disease is arguably the most significant challenge for health care systems.[3] The financial and social burden from chronic disease has been well documented, discussed and debated.[4] The potential for primary care to achieve reductions in avoidable mortality, avoidable hospital admissions and to reduce health inequalities has become the basis for current government policy.[5,6,7] There has been significant government investment in primary care, as the sector is regularly reminded, but there appears to be little evidence on a national level that there has been significant progress towards improved outcomes.

The Wairarapa has a population of 39 000 with relatively high levels of deprivation spread over a large geographical area. The population is predicted to decrease 1.9% over the next 10 years, whilst the population over the age of 65 will increase by 20.1% and the Maori population over 55 will increase by 40.4%.[8] In common with other parts of New Zealand, the Wairarapa hospital has greater than 30% 'potentially avoidable' hospital admissions and a significant primary care demand on its Emergency Department.[9]

The Masterton practice is a medium-size group practice and currently employs four FTE doctors, six FTE practice nurses, five FTE administration staff and a social worker. Thirty-six per cent of our patients are either Maori, Pacific or are in Deprivation Quintile 5. Capitation funding is under the Interim Formula through the Wairarapa Community PHO.

In 2003, the Wairarapa DHB agreed to fund a modest chronic disease management pilot for diabetes. This funding was sufficient to cover the cost of more intensive management of a small cohort of 40 patients and demonstrated that a reduction in financial barriers to health care and the provision of patient-centred, evidence-based multidisciplinary care could significantly reduce the cardiovascular and diabetes risk in Maori and non-Maori populations.[10]

The success of this project formed a springboard for the development of key principles and realisations within the practice:

1. No management without measurement

Without a convenient means of accurately identifying patients with particular problems or stratifying disease severity or risk of complications, we did not know which patients to target and could not audit our effectiveness.

Management of chronic disease is arguably the most significant challenge for health care systems

2. No consistency without consensus

Despite increasing evidence on how to manage chronic disease, there was a significant lack of consistency among our doctors and nurses as to how conditions were best managed.

3. No teamwork without team 'work'

We quickly identified that there was significant improvement in communication and consistency needed within the medical and nursing teams and between these teams and we established that we were failing to maximise the synergistic benefits of effective doctor and nurse teamwork for the benefit of patients.

The key changes

The approach to Read-coding

There is a large amount of conflicting and confusing information about Read-coding. In fact, Read-coding can be made very simple and is essential for organising and delivering on clinical performance. By 'tagging' a patient with a Read-code for a chronic disease it allows creation of the chronic disease registers and production of disease specific audits of performance. We simply attached the limited Read-code list to the side of every computer to help remember the key Read-codes and to ensure that they get used consistently.

The formation of chronic disease registers

Disease registers were essential for the organisation of chronic disease management services. However, it was also essential that the process for constructing the registers was designed so that it caused minimal disruption to work patterns or increased workload. A structured medication review protocol was developed, triggered by patients' requests for repeat prescriptions. When a repeat prescription was issued, a patient's medical and drug records were reviewed and the patient's Long-Term Classifications were updated using an agreed list of limited Read-codes. In addition, nurses screened all incoming mail and highlighted patients identified as suffering from a chronic disease for Read-coding by a GP. We also produced database queries selecting patients that may have been previously coded in an erroneous way or who were on disease-specific medications indicating the diagnosis, e.g. thyroxine for hypothyroidism. Lastly, we searched the patient's history file for classifications that might have been missed.

The practice guidelines

We developed concise, pragmatic, primary care orientated, evidence-based guidelines for the common chronic diseases, including recommended laboratory monitoring and therapeutic drug monitoring for regularly-used medications such as statin drugs. These guidelines were drawn from a number of sources with

particular reference to New Zealand guidelines where these were available. The guidelines became the focus of continuing medical education for both doctors and nurses. All clinical staff committed to these guidelines and agreed to follow best practice as defined in the guidelines unless prohibited by extenuating clinical circumstances. This process minimised conflicting advice and inconsistent management between doctors and between doctors and nurses.

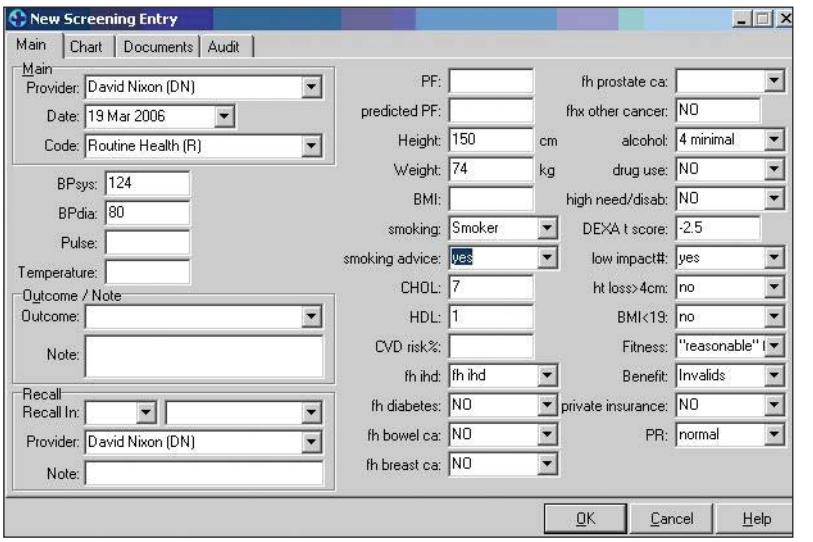
The specialisation of nursing roles

The practice created diabetes, cardiovascular and respiratory nurse leads taking responsibility for disease register-based recall of patients, identification of patients lost to follow-up, patient education and health promotion and annual reviews.

The introduction of Care Plus in July 2004 enabled us to develop and expand this service and we currently have 475 patients on the Care Plus programme.

Nurse-led clinics provide patient education about the nature of their illness, its implications, treatment options, treatment objectives and the patient's current performance. All staff focus on data acquisition at every clinical interaction, thereby encouraging opportunist screening by the nursing team including BP, smoking status, height, weight and family history.

Figure 1. Routine Health Template



Embracing the concept of the patient-centred approach and the 'expert' patient

We worked with our team to develop a patient-centred approach, ensuring patient understanding, sharing management options and working with the patient to develop a culturally, socially and financially appropriate management plan which fitted with their health beliefs. This enabled many of the patients to become 'expert patients', understanding the nature of their illness and its potential implications, the benefits and risks of their treatment options and the schedule of care provided by the practice.

Table 1. Disease prevalence rates 2004 and 2005

Disease	Read code	2004	2005	% increase
Asthma	H33	14.70%	15.16%	3.13%
CCF	G580	0.70%	0.91%	30.23%
COPD	H3	2.00%	3.16%	58.06%
CVA	G66	0.60%	0.82%	37.23%
Depression	E2B	5.60%	7.81%	39.42%
Diabetes	C10	3.40%	3.63%	6.82%
Glucose intolerance	C3135	0.40%	0.96%	138.94%
Hypothyroidism	C04	0.90%	1.10%	22.53%
Hypertension	G20	11.00%	13.10%	19.10%
Hyperlipidemia	C324	7.80%	13.10%	67.96%
IHD	G3	2.70%	3.23%	19.81%
Osteoporosis	N330	1.00%	1.18%	17.63%
TIA	G65	0.60%	0.79%	32.33%

The use of technology

Along with the majority of medical centres in New Zealand, we run the MedTech-32 Practice Management Software. Whilst we are confident that our programme would adapt to other practice management systems, we have not had the opportunity to test this. MedTech-32 has proven to be an excellent system for our needs but we found that there were changes that we had to make at a number of different levels to facilitate our programme. Probably the most important of these was to set up a master screening term referred to, by us, as Routine Health. All blood pressures, height, weights, smoking status and relevant family history information are entered into this template. We also use it to screen for alcohol, drug problems and osteoporosis. The current Routine Health template is shown in Figure 1.

It is a relatively simple process to map incoming blood test results to a screening term and to make fields, within the screening term, compulsory. In this way, it is possible to routinely and opportunistically collect the dataset required to calculate a patient's CVD risk, i.e. whenever a patient has lipids checked, the total cholesterol and HDL map automatically into the Routine Health screening term. A patient's smoking history and family history of IHD must be entered before exiting the Routine Health template.

Results

The main medical disease registers are approaching, or are consistent with, national prevalence rates. In 2003, we were unable to produce any of these registers. Table 1 shows the prevalence rates and the changes over the last 12 months.

The changes in practice team activities led to the following examples drawn from our Quality and Audit report:

Diabetes

There were 164 diabetic patients who had a diabetic annual review in both 2004 and 2005. The comparative data is shown in Table 2.

The most encouraging statistic here is that the proportion of patients with HbA1c >8 has decreased from 29.9% to 22%. Sustained improvement would result in a significant reduction in morbidity and mortality. There has also been an 11% reduction in LDL representing an improvement in a further independent cardiovascular risk factor.

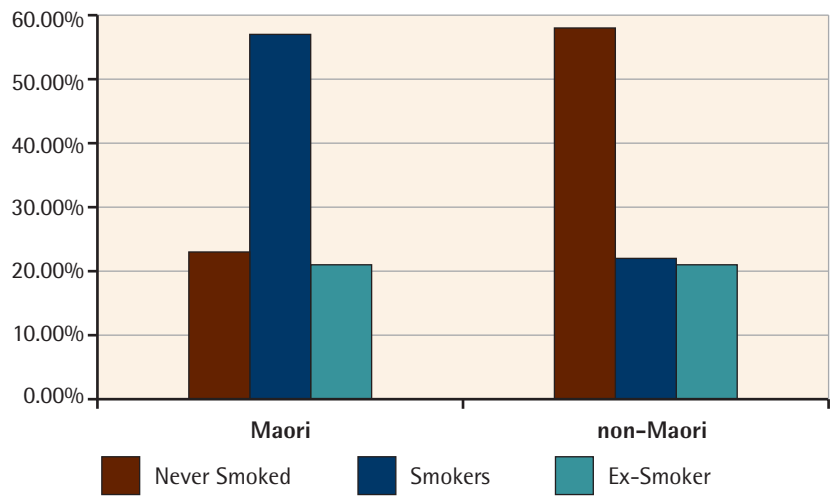
Table 2. Annual diabetic review 2004 and 2005

	2004		2005	
Diabetic patients in common	164		164	
Smokers	25		26	
HbA1C>8	49	29.9%	36	22.0%
On statin	77	47.0%	94	57.3%
Av.HbA1C	7.5		7.5	
Av.systolic	135		134	
Av.diastolic	79		78	
Av.cholesterol	5.0		4.6	
Av.HDL	1.3		1.3	
Av.LDL	2.8		2.5	

Table 3. Change in CVD risk 2004 to 2005

Average age	66.4	
Maori patients	18%	
	2004	2005
Av. BP	136.9	128.8
Av. Total Cholesterol	4.9	4.8
Number of diabetics	48	52
Number of smokers	15	12
Av. CVD Risk	15.3	13.9

Figure 2. Smoking status – Maori and non-Maori



Audit of our Care Plus programme

We elected to compare the current CVD risk for 100 randomly-selected Care Plus patients with their risk 12 months previously. A 9.0% decrease in absolute CVD risk for these 100 patients was achieved despite the fact that they were a year older on their second assessment (Table 3).

Audit of smoking statistics

We had 5402 enrolled persons over 15 years on the 30th June 2005, of whom 41.0% had had a recorded smoking status within the last two years. The breakdown of data, by ethnicity, reveals a higher proportion of smokers in our Maori community, which may, in part, explain their significantly higher premature mortality due to cardiovascular disease (See Figure 2).

Further analysis by deprivation quintile produces even more sobering results as we see a widening differential between Maori and non-Maori (Figure 3).

Although numbers are small and this obviously distorts the percentage of Maori smokers in quintile 1, the fact that, in the lower two quintiles, over 60% of Maori patients over the age of 14 are smokers, represents a significant problem. It also highlights a potential opportunity for significantly reducing the burden from IHD in this group of patients.

Our IHD register includes patients that have had proven angina, a myocardial infarction, or have had an intervention such as angioplasty or coronary artery bypass grafting. It also includes a few patients with peripheral vascular disease but without proven IHD. The reason for including the small cohort of PVD patients is that the secondary prevention targets and medical interventions are the same as for IHD.

Our audit reveals that, despite having made significant improvements, we still have some way to go with only 10% of our patients receiving all four of the recommended combination of ACE inhibitor, beta blocker, aspirin and a statin (Table 4).

CVD risk assessment

The application of consistent, constrained Read-coding, combined with validated Disease Registers, standardised data entry, opportunistic screening and additional software, complementary to MedTech-32, has meant that we are able to calculate CVD risk across our total eligible population as virtually an automated process. This has meant that we are able to identify individuals with high baseline risk of CVD risk as well as sub-populations that are at increased risk e.g. smoking Maori males or patients with known IHD (Figure 4).

Discussion

In a recent study Manuel and colleagues estimated that about 35% of

Figure 3. Prevalence of smoking

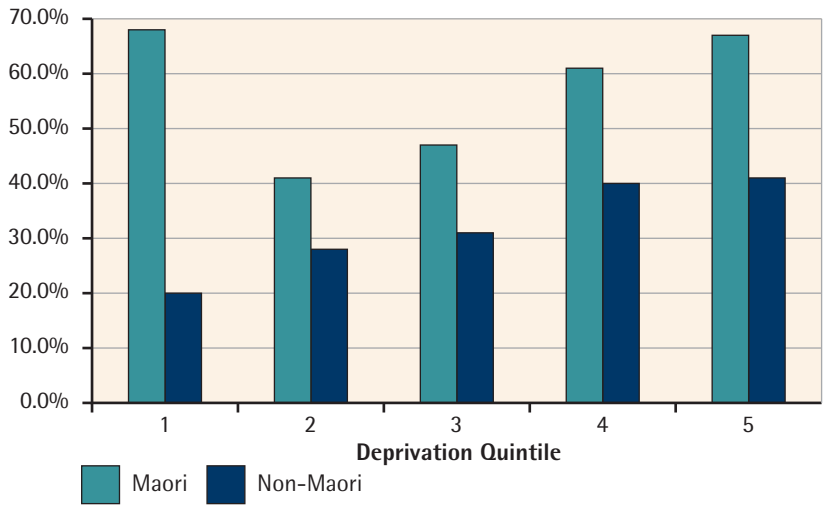


Table 4. IHD audit 2005

IHD Dataset		
Patients		219
Smoking Status		
Smokers	34	15.5%
Ex smokers	99	45.2%
Non smokers	86	39.3%
Ethnicity data		
Pakeha	162	74.0%
Maori	32	14.6%
Other	25	11.4%
Clinical Indicators		
Average sys. BP	134	
Chol. checked	205	93.6%
HDL checked	205	93.6%
LDL checked	116	53.0%
Av. chol.	4.8	
Av. HDL	1.4	
Av. LDL	2.6	

Conditions		
Angina	159	72%
MI	104	47.5%
Cardiomyopathy	10	4.6%
CABG/angioplasty	18	8.2%
Medications		
Aspirin	149	68.0%
Betablocker	106	48.4%
Statin	125	57.1%
Ace Inhibitor	85	38.8%
0 out of 4 drugs	9	4.1%
4 out of 4 drugs	22	10.0%

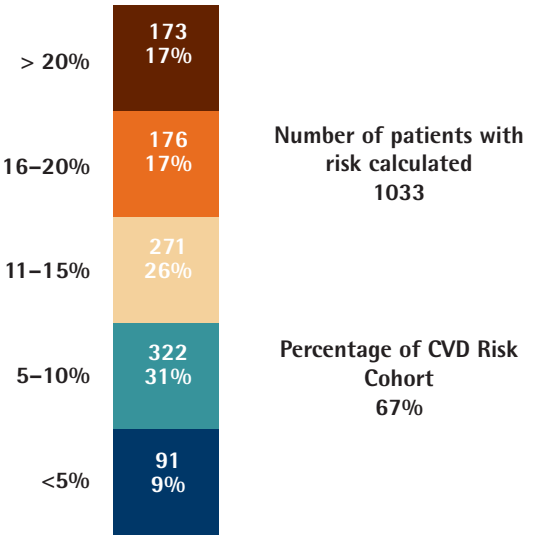
predicted deaths from CVD occurred in the 4% of Canadians with a history of symptomatic disease.[11]

To achieve maximal secondary prevention, patients with known IHD need to be accurately identified and optimally managed.

From a primary prevention perspective Manuel and colleagues reviewed the strategies for reducing coronary heart disease. Strategies were divided into population based strategies to reduce the cholesterol of the whole population, targeted treatment of elevated cholesterol and a high baseline risk strategy which was defined as treating individuals who were found to have a high calculated CVD risk.

The high baseline risk strategy was consistent with the New Zealand guidelines[12] and the evidence shows that a small proportion of the population at high absolute risk of CVD can contribute a large proportion of all deaths from coronary heart disease.[13] Manuel et al. concluded that *'a reasonable approach to reducing deaths would include both a high baseline risk strategy and a population health strategy for populations with moderate baseline risk.'* The Foundation Program has allowed us to pursue both these strategies.

Figure 4. Practice CVD risk burden



Conclusions

We feel that this programme demonstrates that general practice benefits from operating as a system rather than an amalgamation of skilled individuals. In our own practice this is facilitated by having salaried GPs able to focus on overall objectives of the practice rather than the individual need for income.

We benefited from the opportunity to use collaboration from a visiting practitioner from the UK, bringing new ideas about service delivery. We made the positive decision to aspire to effect change within the culture of our practice for the benefit of our practice population.

We have chosen to do this without waiting for, in our opinion, the inevitable financial incentives to be introduced, which are so necessary for broadening the improvement in measurable health outcomes aimed at by the Primary Health Care Strategy. We do not consider that the current PHO Clinical Performance Indicators are either focussed at the right targets or sufficiently well remunerated for those that invest the considerable effort necessary to achieve measurable high quality population-based outcomes.

Acknowledgements

Fiona Samuel, Clinical Nurse Leader, Anne Davies, Practice Nurse, Libby Trafford, Practice Manager, Kevin Preston, Software Engineer.

Competing interests

None declared.

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