

Chronic Care Management Programme

Interim Programme Evaluation Report

April 2005

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1. Background

The CCM programme was initiated in 2001 in two pilot practices. These practices have since fully implemented the programme and used in house processes to drive Continuous Quality Improvement (CQI) processes to improve outcomes.

The pilot practices demonstrated what could be achieved, and were evaluated in 2001¹. Since then the tools have been distributed, installed and supported in a further 40 practices in conjunction with a DHB quality improvement programme to improve the robustness of the information systems and more timely reporting. As at November 2004 there were 4,231 patients enrolled across the diabetes, CVD, CHF and COPD modules.

This interim evaluation provides the opportunity to assess the effectiveness of the wider roll out of the programme and identify areas for improvement based on the evaluation results.

2. Purpose

The purpose of this evaluation is to:

- Assess the effectiveness of the programme in terms of patient involvement, patient outcomes, secondary care usage
- Assess the effectiveness of the implementation of the programme
- Make decisions as to what changes may need to be made to the programme, including where extra assistance to PHOs is required

3. Stakeholders

The immediate interested parties are:

- Counties Manukau DHB
- GPHO
- Participating PHOs

¹ Gribben B. CMDHB Integrated Care Evaluation 2000-1: Diabetes disease management.

4. Evaluation methodology

The evaluation included both quantitative and qualitative components as shown in the following table:

Evaluation methodologies

Area of investigation	Data in reporting database	Data in cube	DHB data sources	Existing reports	Provider questionnaire	Staff interviews
Patient attendance		Y				Y
Diabetes outcomes	Y	Y				
Secondary care utilisation			Y			
Programme implementation				Y	Y	Y

Existing reports included:

- Review of CCM patient attendance- PHOCUS on Health
- Evaluation of the CCM electronic decision support- Kate Hewitson
- Evaluation of the CCM monthly reports - Kate Hewitson

5. Effectiveness of the programme

5.1 Patient involvement

As of 30 November 2004, 3,964 patients were enrolled in CCM diabetes, 99 in CHF, 75 in COPD, and 93 in CVD. Of these 23% were Maori, 51% Pacific, 18% NZ European and 8% other.

At November 2004 64.2% of diabetes patients in the programme were up to date with their checks (have been seen within the last 14 weeks). This has changed significantly since March 2004 as shown in the following table:

Attendance rates for all patients enrolled

Attendance status	At March 2004 ²	At November 30 2004 ³
Up to date*	43.7%	64.2%
Missed last check only	15.3%	14.9%
Not seen for at least 6 months	41.0%	20.9%

*have been seen within last 14 weeks

The large decrease in those not seen for at least 6 months is largely due to practices having gone through their patient lists and dis-enrolled those who have moved, deceased or were enrolled in error (eg Get Checked only patients who were enrolled in CCM in error).

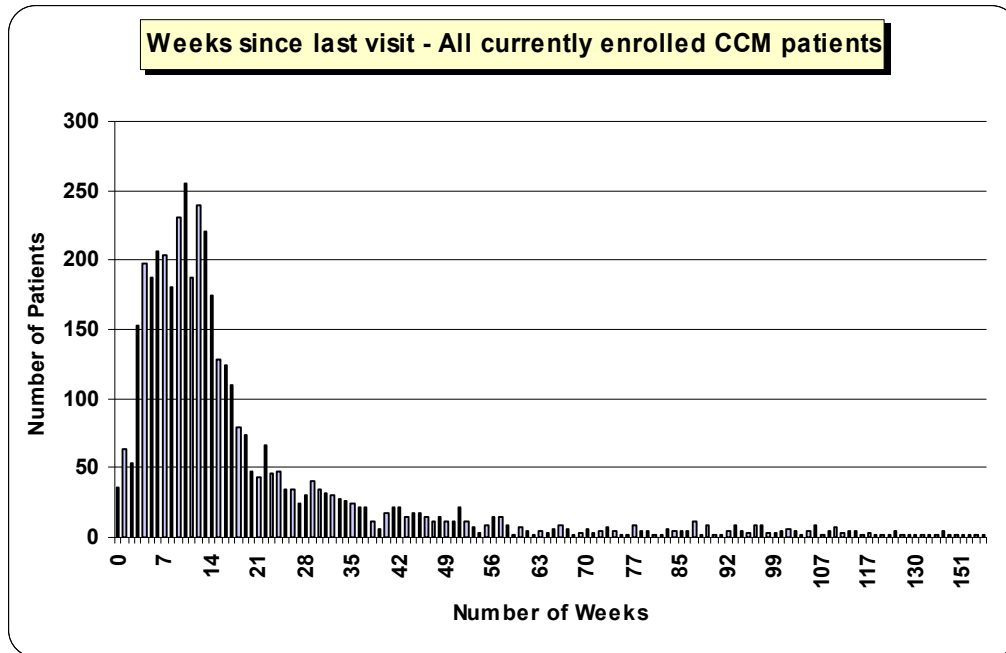
A total of 876 patients were dis-enrolled between May and October 2004: approximately 600 of these were enrolled in error. Numbers being lost to the programme due to moving practices does not appear to be significant (estimated at between 5 and 10% per year).

The following graph shows the frequency distribution for the number of weeks since each CMDHB patient currently enrolled in the CCM programme was last seen, as of 14th January, 2005. 59.5%⁴ have been seen in the last fourteen weeks, and a further, 10.3% have been seen within the last 18 weeks.

² Review of CCM patient attendance report – PHOCUS on Health

³ Data from standard programme reports, 30 November 2004

⁴ This figure is lower than in November 2004, presumably due to delayed visits over the Christmas break



There are many reasons why patients may not be able to come for their next check on time; holidays, spending time back on the marae or in the islands, family commitments, difficulty with transport, or have changed GPs or died but have not yet been dis-enrolled. Other patients may have been in less than 10 weeks since their previous check and been reviewed, but to qualify for CCM check there is a minimum interval of 10 weeks since the last check. We do know from one practice analysis that CCM diabetes patients are seen by a GP an average of 9 times each year⁵. Most patients are on regular medication which they need every three months, so there is perhaps scope to better integrate timing of checks with need for medication. In the practice questionnaire (described in detail in Section 6) it was estimated that only two thirds of patients had the timing of their checks matched with the timing of their next regular prescription.

If patients are not coming for their regular checks every 3 months it is difficult for the programme to be fully effective in supporting patient self management and in changing patient outcomes. Therefore the up to date rate is a concern.

A literature review was unable to find published data on attendance rates in other similar interventions with which comparisons could be made to this programme⁶.

⁵ Utilisation review of 50 CCM patients by Gary Sinclair

⁶ Literature search and review: patient attendance and adherence. K Hewitson. December 2004

5.2 Patient outcomes - diabetes

Currently diabetes is the only module with sufficient long term data for an evaluation of patient outcomes.

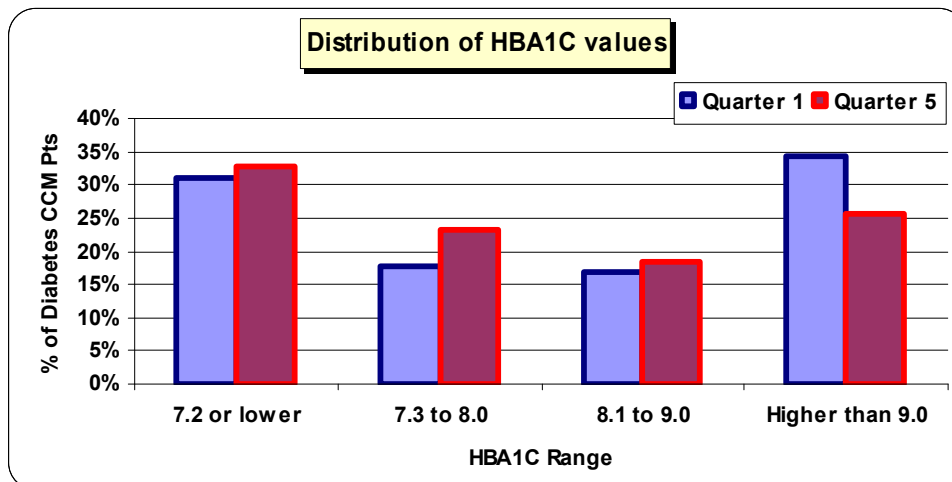
A. Change in HbA1c

For all those currently enrolled in the programme as of 30 November 2004 (3964 patients), the average HbA1c at enrolment was 8.7⁷.

Analysis of data from patients for whom we have follow-up data at one year.

After one year in the programme the average decrease in HbA1c is 0.34⁸. (This result is from data on a strict cohort of 1,544 patients out of the 2,804 who have been enrolled in the programme for more than a year and had a check at one year – the others either missed that check or have not yet been in the programme for one year). If patients from the 2 pilot practices are excluded the average decrease falls to 0.22 (1060 patients).

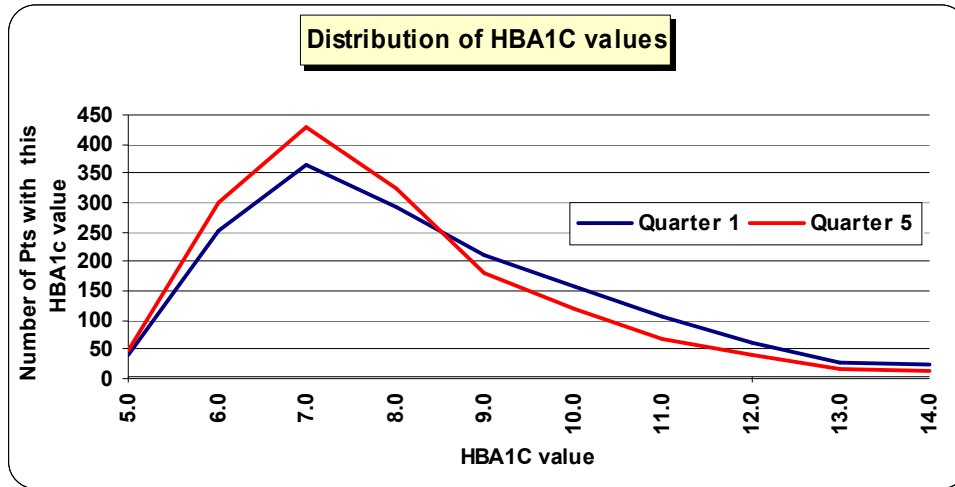
For these patients, the distribution of HbA1c values was calculated as shown in the following graph. The number of patients with an HbA1c over 9% has fallen from 34% at quarter one to 26% at quarter two, with a concomitant increase in the patients with an HbA1c below 8.0 as shown in the following graph.



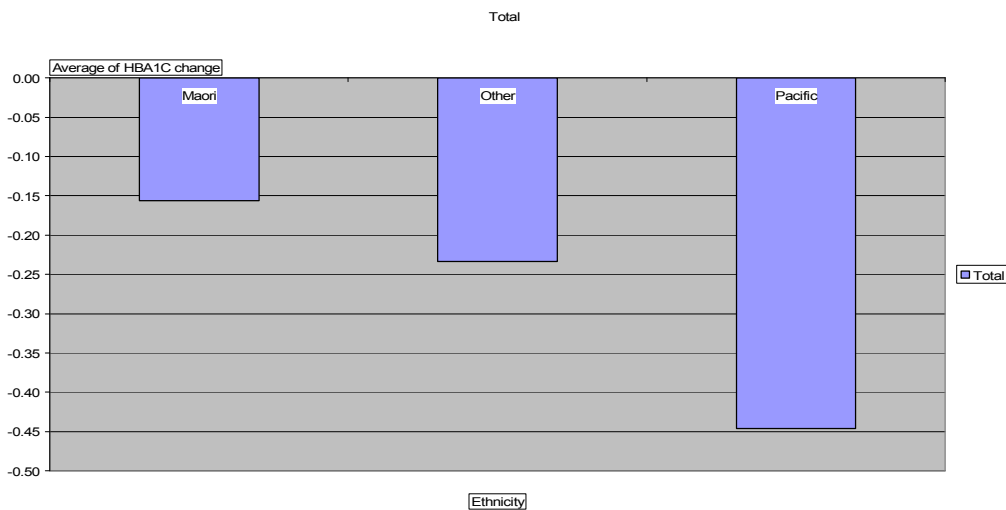
⁷ From standard programme reports, 30 November 2004

⁸ Data from CCM database

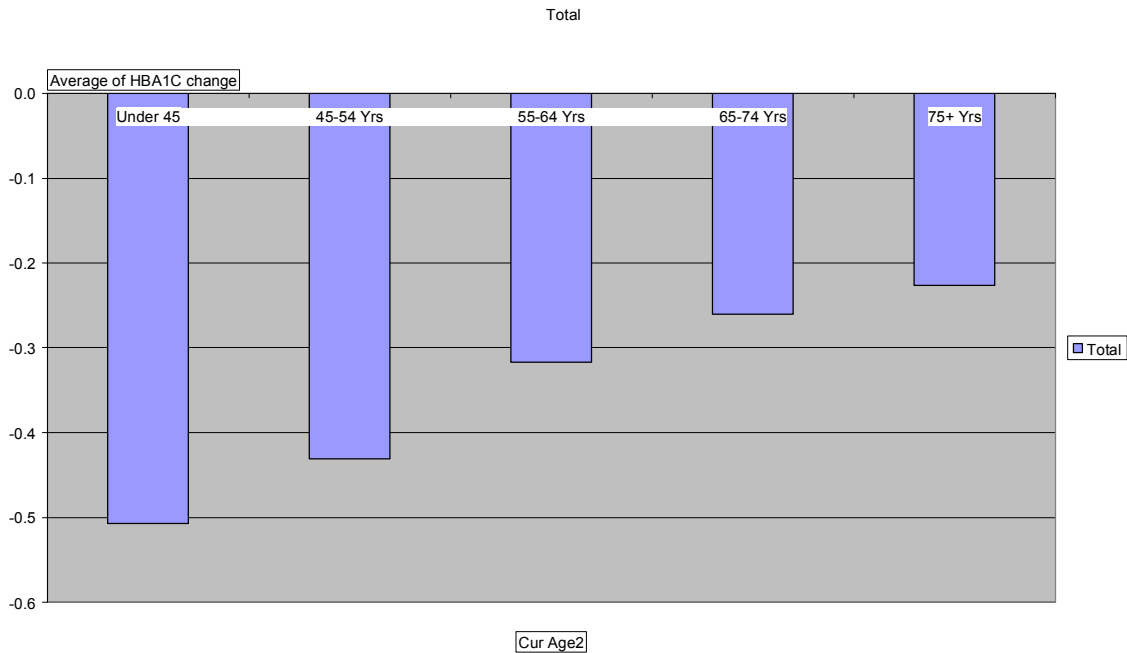
The following graph shows the same data as a frequency distribution.



Further analysis of this same data shows that HbA1c is affected by ethnicity and age. Pacific peoples have the greatest change in HbA1c, and Maori the least (one way analysis of variance, $P=0.014$) as shown in the following graph. (This result is influenced by 'other' ethnicity having a lower HbA1c at baseline and by a number of Pacific outliers who showed a large improvement.)



HbA1c is more likely to decrease in younger patients (regression analysis P=.05), however the change with age is small: over 50 years the effect is a difference of 0.3 in HbA1c. This trend is shown in the following graph.

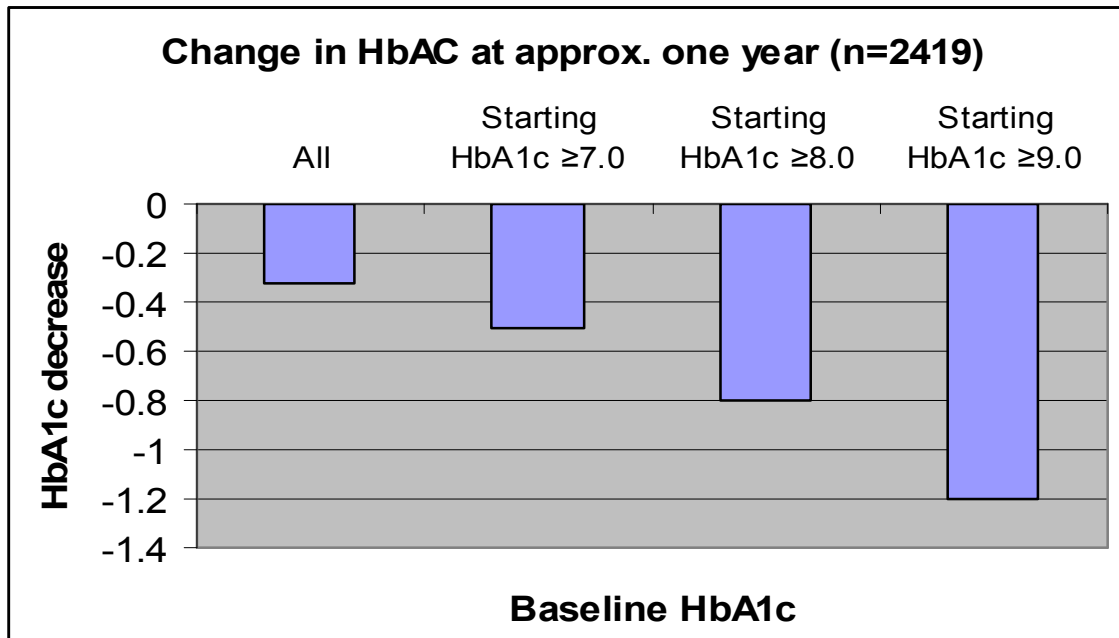


Analysis of data for patients for whom we have follow-up data at 9-15 months

Since a large number of patients had not attended for a quarterly review at one year after enrolment, the above calculations were repeated adding in HbA1c data from the 15 month or nine month review, where there was no review at one year. In addition this data was further analysed to look at average change depending on the baseline HbA1c. This shows that the average decrease for those patients who started with a high HbA1c is much greater.

Change in HbA1c as a function of baseline HbA1c

	All	Starting HbA1c ≥ 7.0	Starting HbA1c ≥ 8.0	Starting HbA1c ≥ 9.0
n =	2419	1921	1380	917
Average change HbA1c	- 0.32	-0.5	-0.8	-1.2



The programme particularly targets those patients with either a starting HbA1c at or greater than 9 (or those with other concerning features such as high BP or lipid levels or smokers). For those 38% of patients enrolled because their high HbA1c level, 72% had a decrease in HbA1c at one year, the average HbA1c decrease was 1.2, and one third had a decrease of 2.0 or more.

Data at two years post enrolment

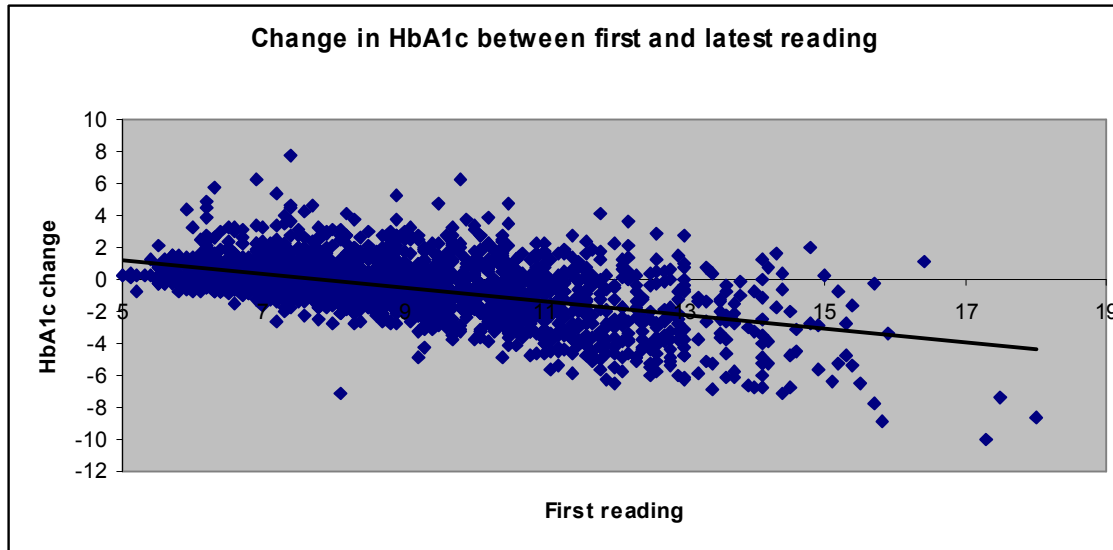
After two years in the programme the average decrease in HbA1c is 0.32 (data on a cohort of 647 patients who had reviews at two years, 553 of whom were in the pilot practices).

Data from enrolment compared with latest data on all patients

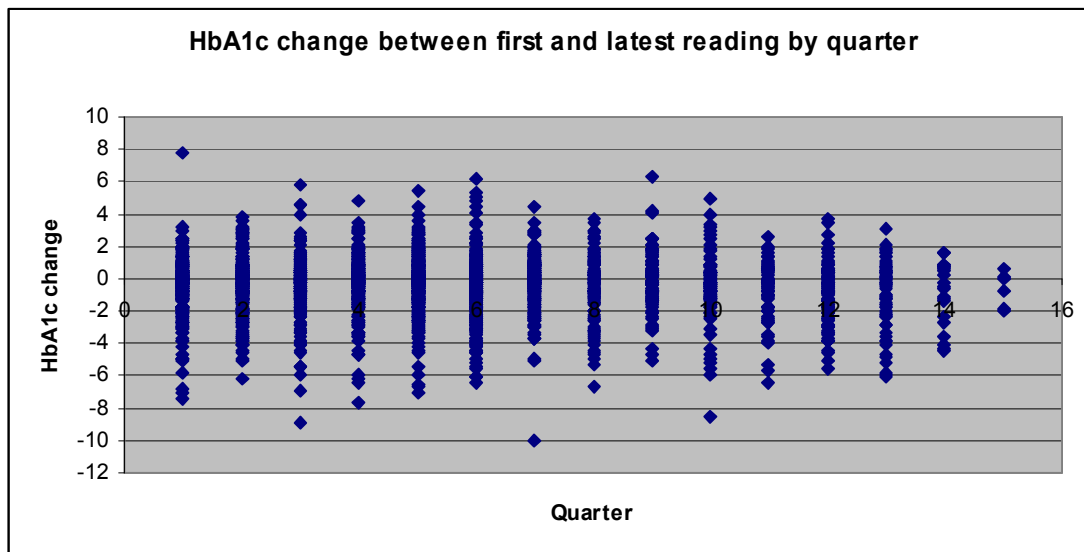
The following graph shows how the difference between baseline and latest HbA1c⁹ and varies with level of baseline HbA1c for the 2,751 patients for who we have data on more than one occasion¹⁰. The regression line has an R² value of 0.2885 which means that there is a weak relationship – there is a greater decrease in HbA1c if the baseline HbA1c is higher. (Those with a baseline value greater than 7.78 tended to have a decrease in HbA1c between first and latest reading. Conversely those with a lower baseline HbA1c tended to have a small increase in HbA1c. However given the low R² value these results should be interpreted cautiously.)

⁹ Data from CCM Cube

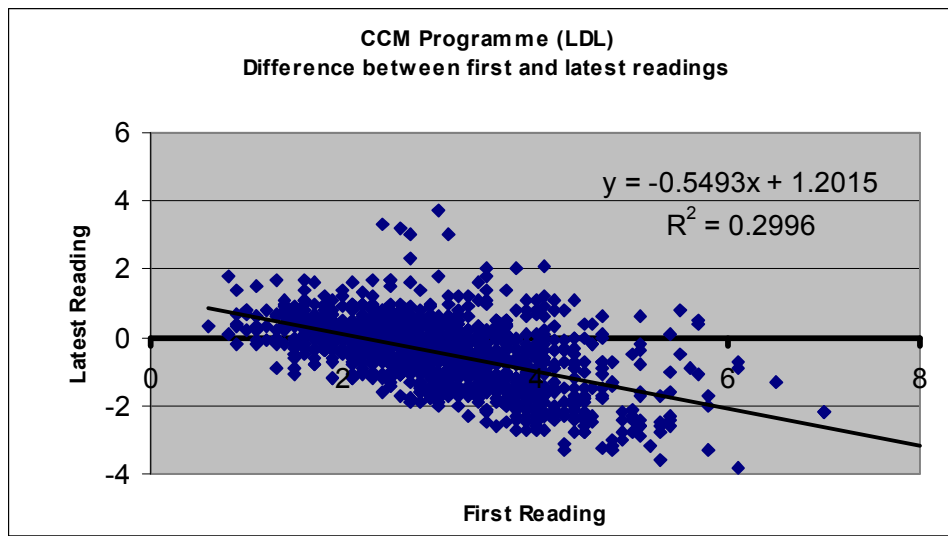
¹⁰ Data from CCM database



Using the same data, the next graph shows the difference in HbA1c for each patient cohort over the 15 quarters since patients were first enrolled. There is no relationship between time and improvement – the R^2 is -.0006.



B. LDL levels have dropped. LDL levels for patients that have been seen at least twice (1,793 patients)¹¹ have an average on enrolment LDL of 3.02, with an average decrease of 0.41 to a mean of 2.61 by the time of the last review. The decrease is the same regardless of whether pilot practices are included or not. Changes in LDL levels against base line levels are shown in the following graph. There is a weak association between baseline level and degree of change.



C. Statin prescribing: 70% of patients were on a statin at their last visit. This is the same across all ethnicities, and is lower for patients under 45 years or over 75 years. Currently the percentage of patients on statins at enrolment is 45.8%¹², but this figure includes those enrolled before the change in access to statins.

D. Blood pressures have fallen. BP levels for patients that have been seen at least twice (2,647 patients) show an average enrolment systolic of 135.8 and diastolic of 82.7, with an average decrease of 2.6 for systolic and 3.0 for diastolic by the time of the last review¹³.

At their last visit 65% of patients were on an ACE inhibitor, with a trend¹⁴ to Maori and Pacific being more likely to be on ACE inhibitor than other patients, and older and younger patients being more likely to be on an ACE inhibitor¹⁵.

¹¹ Data was only analysed on patients enrolled since December 2002 since access to statin medications was freed up 3-4 months before these patients were enrolled. Data source: CCM database.

¹² From standard programme reports, 30 November 2004

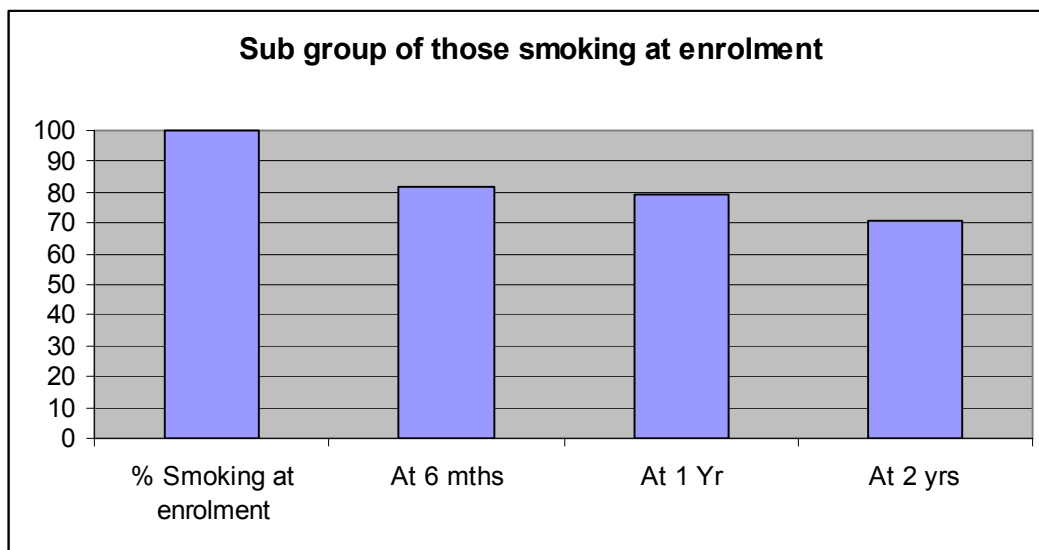
¹³ This change has not been statistically analysed

¹⁴ This change has not been statistically analysed

¹⁵ Data from IC Database

There has been no appreciable change in BMI. Average entry BMI is 34.00, and average drop is .01.

E. **Smoking.** At enrolment 1,199 of the patients enrolled in diabetes were categorised as smokers. For the 912 of these patients for whom there is now data at 6 or 9 months post enrolment, 18% (168 patients) were no longer smoking by then. For the 787 for whom there is data at 12 or 15 months post enrolment, 21% were no longer smoking. For the 263 with data at two years the percentage who have stopped smoking has increased to 29%. This gradual decrease in the numbers still smoking is encouraging¹⁶.



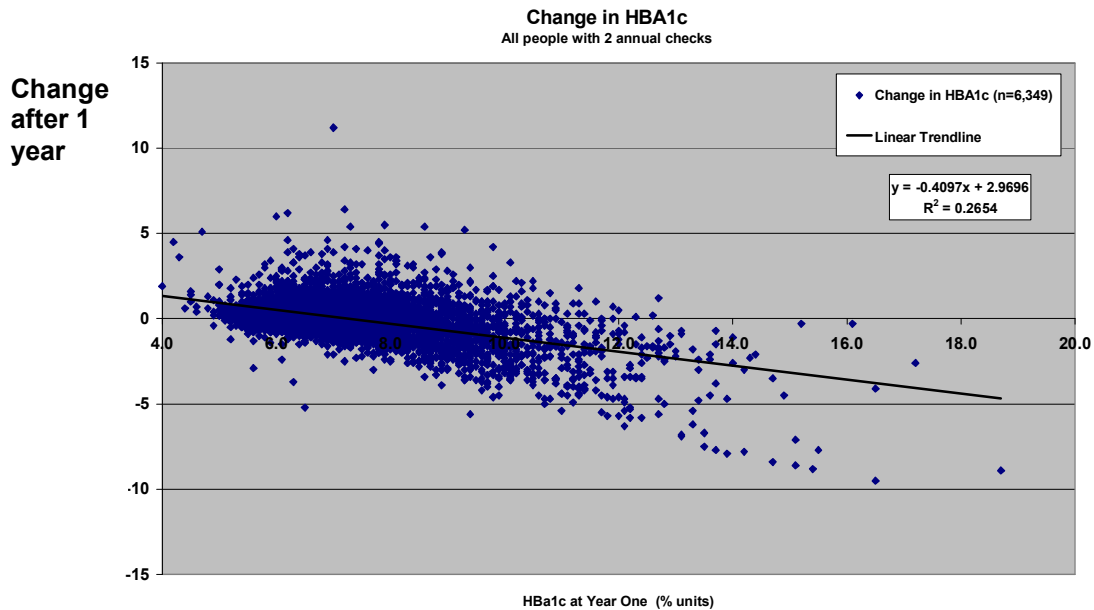
¹⁶ Changes in total smoking rates over time have not been analysed as other studies would suggest that a significant number of patients say they do not smoke at enrolment but are more honest once they have formed a better relationship with their health providers, and hence rates appear to increase. See Hauora Taranaki PHO Ischaemic Heart Disease Management Programme report, 2003

Comparison of outcome data with other programmes

First it must be noted that not all patients with diabetes are accepted into CCM, but must meet target group criteria. Hence in general this is a group with more severe diabetes or associated risk factors. In addition 74% of patients are Pacific or Maori ethnicity – a very different ethnicity distribution than most population groups studied.

Get Checked Programme

Data from the Get Checked programme¹⁷ on 6349 patients who received checks in 2001 and 2002 shows an average initial HbA1c of 7.38. Patients with an initial HbA1c greater than 7.25 (7.78 for CCM) were more likely to show a decrease in HbA1c, however when changes were averaged out for the whole group there was no overall decrease in HbA1c between the first and second check.



South Med IPA carried out a diabetes project in 1999-2000 which involved pre and post audit, guideline implementation, peer groups, opinion leaders, reports with feedback of results and academic detailing. The average decrease in HbA1c for 1,863 patients after one year was 0.36, from a mean of 8.3 to a mean of 7.94. This result is similar to CCM.

¹⁷ Presentation by Sandy Dawson, MOH, Sept 2003 "The New Zealand Experience"

The recent UK Dream trial¹⁸ from April 2002 to June 2003 followed 3,079 patients in 58 practices (30 intervention practices and 28 control practices). The aim of the trial was to “evaluate the effectiveness and efficiency of an area wide ‘extended’ system incorporating a full structured recall and management system, actively involving patients and including clinical management prompts to primary care clinicians based on locally-adapted evidence based guidelines”. Their preliminary data is shown in the following table:

Dream trial data

Measures	Control Practices		Intervention Practices	
	Baseline	Follow-up	Baseline	Follow-up
Last recorded systolic BP	144.5	144.6	145.8	144.2
Last recorded diastolic BP	80.2	78.1	79.2	77.8
Last recorded HbA1c	7.56	7.35	7.75	7.32
Last recorded cholesterol	5.27	5.06	5.23	4.94

Statistical analysis of the above data showed that intervention patients had significant decreases in cholesterol levels. The HbA1c drop of 0.43 in the intervention group was not significantly different from the drop in the control group of 0.21.

Literature review

A review of the published scientific literature from 2000 to 2004 was carried out searching on the key words of diabetes and disease management and looking for reported changes in Hba1c levels in the abstracts. The results are summarised in the table below. They show that disease type management programmes for diabetes that are published in the literature usually achieve reductions in HbA1c from 0.5 to 1.5%. It should be noted that a number of studies are still measuring processes rather than outcomes e.g. whether an HbA1c or a foot check has been done: in CCM these are required data items and so are done in 100% of patients.

¹⁸ Final report to NHS R&D.A randomized controlled trial of a Diabetes Recall And Management System: the DREAM Trial

Paper ¹⁹	HbA1c changes	Comments
Lim, Toh, Emmanuel et al	In DM group HbA1c decreased by 2.0. (Went up in control group)	Singapore. 163 pts. Significant improvement when compared to control group
Sidorov, Shull, Tomcavage et al	6.7% had HbA1c >9.5 in DM group, vs 14.4% in standard care	Pennsylvania. 6799 pts (3118 in programme).
Sidorov, Gabbay, Harris et al	HbA1c dropped from 8.51 to 7.41	Pennsylvania, 5332 patients.
Abisser, Harris, Winter	Education alone - no change. Education + Self man. HbA1c dropped 1.1 by one year (+/- computerised)	Florida. 978 pts. 3 groups - education alone or plus self management training +/- computerised pt programme
Grey, Maljanian, Staff et al	HbA1c dropped from 9.3 to 6.8	Hartford USA
Ibrahim, Beich, Sidorov	Statistically significant change in HbA1c	Pennsylvania. 252 pts.
Stoner, Lasar, Butcher et al	Initial HbA1c 8.7, dropped to 7.5 at one year, still 7.5 at 2 yrs	Mont., USA
Piette, Weinberger, Kraemer	For those with baseline = or >8%, at one year active group HbA1c 8.7, control 9.2	California. 272 pts. Telephone follow up rather than disease management
Staker	HbA1c dropped from 10.5 to 7.2	Utah. Changes to practice delivery systems rather than full DM
Steffans	HbA1c dropped by 0.5 Hospital admission rates decreased 22%, bed days reduced 34%	John Deere health Care
Sperl-Hillen, O'Connor, Carlson et al	HbA1c dropped from 7.86 to 7.4	Minneapolis. 18 practices.
Steines, Piehlmeier, Schenkirsh	HbA1c in DM group 7.0, control group 8.4	Germany. High risk patients

¹⁹ Full references are available

In conclusion the CCM programme has been successful in terms of lowering and lipid levels and at increasing statin prescribing. Even though the average drop in HbA1c over the whole programme is not large, it is significant for those who started with an HbA1c at or greater than 8.0 and not dissimilar to that achieved in many other programmes.

5.3 Use of secondary care

The assumptions in the initial programme ROI analysis (Version 12) were:

- Diabetes - reduction of .5 bed days per pt per year for year 1 and 1.0 bed day saved from year 2 onwards and annual growth rate for pts on renal dialysis drops from 8% to 5%
- CVD - reduction of 0.5 bed days per pt for first year, 1.7 days thereafter
- CHF - reduction of 0.5 bed days per pt for first year, 2 days thereafter
- COPD - reduction of 2 bed days per year
- Total bed day reductions per year 37,000

Data on all medical and surgical admissions to Middlemore Hospital for each patient who had been in the enrolled in the diabetes programme before 1 December 2003 was obtained for the year before and the year after enrolment (3,276 patients). Similarly for those patients in the programme since before 1 December 2002 admission data was obtained for two years pre and post enrolment (a subset of 1,700 patients)²⁰.

Some of the patients may have not lived in Counties Manukau for the one or two years prior to enrolment and so may have had admissions elsewhere in the pre-enrolment period. Conversely some patients may have died within one or two years of enrolment and therefore would have no more hospital admissions from that date.

Further investigation of the 3,276 patients that were enrolled before 1 December 2003 revealed that 126 had been enrolled in error by three practices and were Diabetes Get Checked patients rather than CCM patients. These have since been dis-enrolled. A further 346 patients were dis-enrolled by a PHO because they were a mixture of Get Checked patients and patients who, although initially enrolled in the programme, had not been adequately followed up. Therefore the NHI s of these 472 patients were removed from the admissions data and the analyses repeated on the 2,804 remaining patients enrolled prior to 1 December 2003 (and 1,574 patients enrolled prior to 1 December 2002).

The raw data is difficult to interpret due to a number of outliers who had either a very large number of admissions or a very long length of stay. For example, there were two patients with bed stays over 100 days, and nine patients with a bed stay

²⁰ A subset of only medical admissions was also obtained and the rates of admission were very similar. The combined medical and surgical admission rates were used for the detailed analysis as these include surgical admissions for the renal and vascular complications of diabetes.

from 50 to 99 days within the time periods studied. Therefore analyses were carried out to determine whether any apparent increases or decreases in admission rates or length of stay were statistically significant, or instead were due to the presence of outlier data distorting the picture. Results are shown in the following table:

Admission data: diabetes - all patients enrolled

	Patients enrolled for one year 3276 pts		Patients enrolled for two years 1700 pts	
	One year pre enrolment	One year post enrolment	Two years Pre	Two years post
Mean Length of stay	4.43	4.81 Not sign (p=0.34) ²¹	4.22	4.43 Not sign (p=0.54) ²²
Median LOS (range)	3 (0-93)	3 (0-129)	3 (0-93)	3 (0-129)
Number of admissions*	745	847	620	854
Mean admissions per pt(range)*	.23 (0-9)	.26 (0-10) Increase not significant, P=.089 ²³	.37 (0-10)	.50 (0-14) Increase significant, P<.001 ²⁴
Number of individuals with an admission*	468 (14.3%)	530 (16.2%) Increase significant P=0.033 ²⁵	355 (20.9%)	433 (25.5%) Increase significant P=0.001 ²⁶
Median number of admissions (for pts with an admission)	1	1	1	1

* per one or two year time period, depending on column

The above table shows that there is a statistically significant increase in mean admissions per patient for those in the programme for two years or more. There is also a statistically significant increase in the proportion of individuals admitted, both for those in the programme for more than one year and more than two years. There was no significant change in average length of stay.

²¹ T test

²² T test

²³ T test

²⁴ T test

²⁵ Test of two proportions

²⁶ Test of two proportions

When the analyses were repeated on the group that excluded the 472 dis-enrolments the results were very similar as shown below.

Admission data: diabetes (excluding 472 dis-enrolments)

	Patients enrolled for one year 2804 pts		Patients enrolled for 2 years 1574pts	
	One year pre enrolment	One year post enrolment	Two years Pre	Two years post
Mean Length of stay	4.49	4.84 Not sign (p=0.38)	4.22	4.46 Not sign (p=0.5)
Number of admissions*	724	829	595	815
Total bed days	3247	4013	2509	3634
Mean admissions per pt*	.258	.296 Increase not significant, P=.075	.378	.518 Increase significant, P=<.001
Number of individuals with an admission*	454 (16.2%)	514 (18.3%) Increase significant P=0.034	337 (21.4%)	410 (26.0%) Increase significant P=0.002

* per one or two year time period, depending on column

The expected decrease in admissions pre and post enrolment, as forecast in the ROI, has not been achieved. Whether this increase in admissions represents lack of effectiveness of the programme in improving the health of patients or a necessary improvement in access to secondary care for patients is unknown. The group with diabetes who fit the target criteria with the programme will include those more unwell patients whose disease will get worse with time and also those who are not so well at managing their own health.

The secondary care utilisation data from CHF and COPD was obtained as shown in the following table. Numbers of patients are too low to draw any conclusions at this

stage. There is stronger evidence in the literature for decreased hospitalisation in these two conditions²⁷, so this may yet be shown in CCM patients.

Secondary care admissions for patients in COPD and CHF for > 1 year

	No. pts	Admits pre	Admits post	ALOS pre	ALOS post
COPD	37	17	19	3.2	3.7
CHF	31	20	17	5.9	4.9

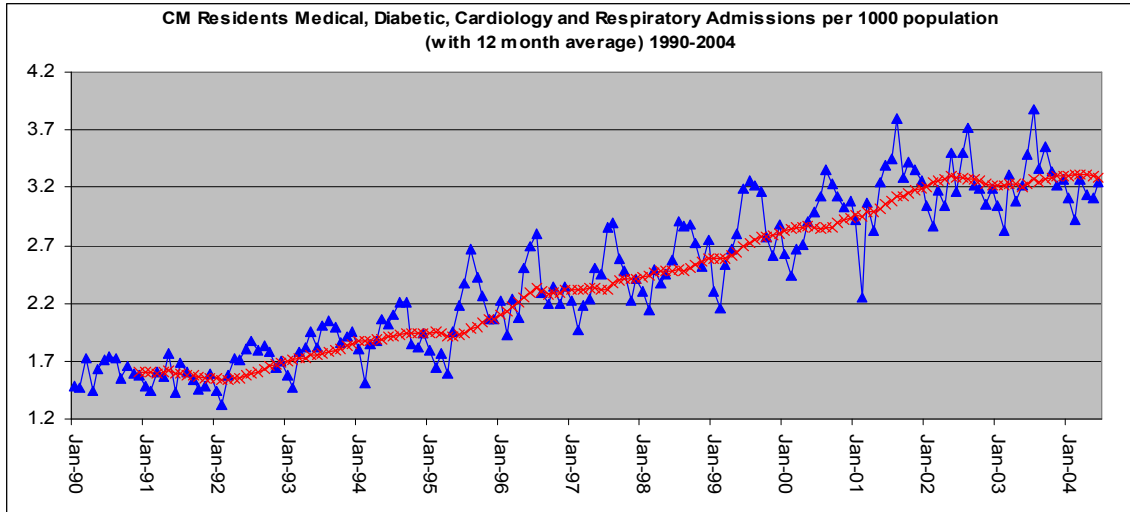
Notes: Patients enrolled by 1/12/2003 included, with data on admissions for one year pre and one year post enrolment. CHF data excludes those who died within one year of enrolment.

ALOS = average length of stay

In regards to renal dialysis the annual growth rate in 2001 was 8%. Since that time this figure has increased to 15 - 16% (population increase from June 01 to June 04 was 8.1%). As yet the programme has not had an effect on levels of renal dialysis. Given the low percentage of patients with diabetes in the region that have been enrolled for more than a year, and the time it takes for patients with poorly controlled diabetes to move to renal failure, the lack of effect at this time is not surprising.

In regards to actual vs predicted medical admission rates for the whole of Counties Manukau the following graph shows that there has been a levelling off in the admission rate since January 2002. Such a change has not been shown in other DHBs, suggesting that the focus of CMDHB on integrated care initiatives which include CCM, has made a difference to overall admission rates. It could be postulated that programmes such as CCM, POAC and reporting to GPs on their admission rates have together brought about a culture change within general practice whereby greater value is placed on caring for patients in such a way as to avoid admissions.

²⁷ Gonseth J et al. The effectiveness of disease management programmes in reducing hospital re-admission in polder patients with heart failure. *Eur Heart J* 2004; 25: 1570-95 and CCM COPD pilot study



Comparison with other programmes

The question arises as to whether the initial ROI was optimistic in expecting such a change in secondary care admissions. Have others achieved this kind of result?

In the literature search for diabetes disease management programmes described above, two papers measured admission rates as follows:

Sidorov, Shull, Tomcavage et al	Admissions 0.12/pt/yr in DM programme, 0.56/pt/yr in control.	Pennsylvania. 6799 pts (3118 in HMO wide disease management programme).
Steffans	Hospital admission rates decreased 22%, bed days reduced 34%	John Deere Health Care provides care for 20,000 patients with diabetes. These results are after one year of their disease management programme.

The Kings Fund review²⁸ of case management (some of the studies reviewed were similar to the level of care in CCM, some had more intensive case management) showed that of the nineteen studies reviewed:

- 5 had significant decreases in admissions
- 4 had decreases that were not statistically significant
- 7 had no change in admission rates
- 2 had a non-significant increase

²⁸ Hutt R, Rosen R, McCauley J. Case managing long term conditions. Kings Fund, London, Nov 2004

A recent article by Fireman et al in Disease Management²⁹, that reviewed the effectiveness of the Permanente Medical Group disease management programmes for their population of three million people, concluded that "The causal pathway - from improved care to reduced morbidity to cost savings - has not produced sufficient savings to offset the rising costs of improved care. We conclude that the rationale for DM programs, like the rationale for any medical treatments, should rest on their effectiveness and value."

Significantly, the October 2004 US Congressional Budget Office *Analysis of the literature on disease management programmes*³⁰ concluded that "there is insufficient evidence to conclude that disease management programmes can generally reduce overall health spending. It is important to note that such programs could be worthwhile even if they did not reduce costs".

In conclusion, it would appear that in Counties Manukau there is no longer an annual increase in acute admission rates - a trend that is different from other DHBs around New Zealand. CCM may have contributed to a culture change within general practice whereby greater value is placed on caring for patients in such a way as to avoid admissions.

To date the CCM programme has shown an increase, rather than a decrease, in admission rates for enrolled patients with diabetes. Disease management programmes in diabetes can on occasions decrease admission rates, but in general do not. There is reason to believe this situation may yet be different for CHF and COPD.

²⁹ Fireman B, Bartlett J, Selby J. Can disease management reduce health care costs by improving quality? Disease Management 2004; 23: 63-74.

³⁰ <http://www.cbo.gov/ftpdocs/59xx/doc5909/10-13-DiseaseMngmnt.pdf>

6. Programme implementation

The key question here is: has the programme been implemented as intended?

Information for this section was collected from the following sources:

- Key informant interviews with CCM personnel
- Review of CCM patient attendance report – PHOCUS on Health
- Evaluation of the CCM electronic decision support report – Kate Hewitson
- Evaluation of the CCM monthly reports report – Kate Hewitson
- Practice Questionnaire

The practice questionnaire was sent to all practices with enrolled patients with a request that each person in the practice involved in CCM complete one. Only 47 replies were received (less than 50% response rate, replies from 23 practices and from five PHOs). However the average number of patients enrolled per responding practice was 166 and therefore the majority of programme patients are cared for by the responding practices. Therefore while giving a useful indication of how the programme is being implemented, the questionnaire results should be interpreted with caution. The questionnaire and full results are shown in Appendix One.

Patient self management

In line with current scientific evidence as to the effectiveness of self management interventions³¹, the CCM plan emphasised the importance of patient self management, patient education and wellness plans (which included goal setting). To enable practice support for patient self management the programme requires an average of 6 hours nursing time per year for each patient. In the interviews with staff of 10 practices in the Review of CCM Patient Attendance, each practice estimated that patients were receiving this amount of time, with a strong emphasis on patient education. In the practice questionnaire results the average nurse appointment time was 24 minutes with 56% scheduling 30-minute nurse appointments. 76% of questionnaire respondents said that their patients had written educational material.

³¹ Newman S, Steed L, Mulligan K. Self management interventions for chronic illness. *Lancet* 2004; 364: 1523-37

Peri K, Kerse N, Halliwell J. Goal setting for older people. A report prepared for the MOH by Auckland University, August 2004

However the average percentage of patients reported as being given a wellness plan was 44% (30% of respondents did not answer this question or did not know, suggesting this figure may be higher than reality). Only one of the ten practices interviewed in the Review of CCM Patient Attendance Report was using the wellness plan. Since the wellness plan includes the development and recording of self management goals with patients this does call into question the extent to which the programme has supported patients to improve their self management skills.

In spite of these low results, there are some who have caught the vision of patient self management. In the questionnaire, encouraging patient self management was the second to most common aspect of the programme that caused the greatest joy (8 responses). The most common response was the joy of seeing improvements in patient outcomes. Conversely when asked what the biggest frustration was in the programme the most common response was the struggle of working with patients who did not appear to want to, or be able to, make necessary life changes.

The low rate of implementation of effective self management interventions is also reflected in the way that programme outcomes that require more patient involvement such as HbA1c, and BMI have shown smaller change than those more influenced by medical management such as cholesterol and blood pressure levels.

A representative group of providers and programme staff met in August 2004³² and identified key barriers to the use of the wellness plan as follows:

- Content issues
- Lack of translation into other languages
- Lack of understanding of the importance of self management by providers
- Lack of coordinated and effective training for all staff
- Ongoing use by patients not reinforced by staff
- Need for a better electronic version

The content plan was updated in light of these concerns by the group and is now also available electronically. Translation of some aspects of the plan into Maori, Tongan and Samoan is currently proceeding. Further education sessions on wellness planning have been developed and are awaiting implementation.

³² See Notes from Wellness Plan workshop on 19/8/04

In terms of cultural responsiveness earlier attempts to implement this aspect of the programme foundered due to internal DHB issues. Planning is now back on track with ownership by both Maori and Pacific who are working with the programme to develop this aspect.

In summary, the patient self management aspects of the programme have yet to be fully implemented.

Community Linkages

The community linkages aspect of the original plan was relatively underdeveloped. All modules have a list of community resources in the practice manuals, but it is not known how often these resources are used.

It is of note that all practices interviewed in the Review of CCM Patient Attendance report had access to Community health workers assistance if patients were not attending for regular reviews and utilised this assistance after either one or two missed reviews.

Current workstreams include exploring this aspect of the programme further.

Practice delivery systems

The Review of CCM Patient Attendance report revealed that practice delivery systems for CCM varied markedly with some practices having highly organised systems such as outlined in the CCM 2001-6 Plan, and others unaware of, or unable to, implement key practice processes. Important aspects of delivery systems lacking in some practices were:

- Flagging the charts of patients so that receptionists, new and locum GPs and PNs are immediately aware which patients are in programme as soon as their file is accessed
- Use of appointment systems for both GPs and nurses to ensure the patient receives adequate dedicated time
- Ensuring laboratory test results are received before the GP quarterly review
- Continuity of care whereby the patients sees the same GP and PN at each review
- Both GPs and practice nurses entering data in the templates

- Timely sending of template data to the Server and actioning of prompts from electronic clinical decision support (ECDS)
- Improving attendance by matching quarterly review timing with the need for repeat prescriptions
- Strong team approach, with identified GP and PN programme leaders and discussion of CCM progress at practice meetings
- Use of CCM reports for quality improvement purposes through discussion at team meetings
- Developing a Wellness Plan with each patient, with follow up by all staff at each patient review

Further information gathered from the practice questionnaire shows that:

- 61% of practices have increased practice nurse hours to manage the project
- Adequate staff time was the third to most common frustration with the programme
- For 57% of practices all practice nurses are involved in the programme, 20% have a single designated CCM nurse, and 24% have a mixture of both
- 98% of practices have an appointment system for GP visits and 87% for nurse visits
- 80% of patients see the same GP each time, and 76% see the same nurse
- 63% of patients have lab results to hand at their quarterly review
- 66% of quarterly reviews are scheduled at the time patients need repeat scripts
- CCM is discussed at practice meetings an average of 6.5 times a year, median of 4 times a year (10 did not answer this question, 15 of the 33 who did, discussed the programme three or less times per year)
- 4/17 GPs and 3/26 nurses do not enter data in the templates

Since the Review of CCM Patient Attendance a Practice Delivery Systems Guide been developed and discussed with all PHOs. It is beginning to be used by PHO staff as they work with practices to improve programme outcomes.

The under emphasis on delivery systems to date may partly explain the low rate of up to date patients in the programme (64.2%).

Decision support

The five key aspects of decision support are:

- Adoption of an evidence based guideline
- Education in regards to best management
- Development of a template that incorporates the guideline and guides good practice
- Electronic clinical decision support (ECDS)
- Links with secondary care

In terms of implementation, each disease in the programme has an active Disease Specific Advisory Group who have adapted or developed a clinical guideline and then used that to develop the PMS template and ECDS rules. Education has been provided to practice staff in regards to the management of the disease and this was rated by questionnaire respondents as moderately effective (4.18 on 5 point scale, with 5 = very effective) in improving the health of patients. However discussions with programme personnel suggest that some providers have missed out on education.

The ECDS is designed to be received during, or at the end of the consultation. However only 45% of questionnaire respondents enter data into the templates during the consultation, and only 49% send the data to the server at the conclusion of the consultation (26% at the end of the day, 26% once a week). Therefore the receipt of ECDS advice is delayed.

The monitoring of the ECDS advice is done by the GP in 40% of cases, by the nurse in 24%, a combination of nurse and GP in 26% and by the practice manager in 10% of practices. Only 21% of respondents (31% for GP respondents) said they made changes to patient management in response to ECDS at least monthly, with 40% saying they had never changed clinical management in response to ECDS messages. The most common change made is to medication, with changes in referral patterns being next most common.

Notwithstanding the delayed receipt of, and infrequent response to ECDS, it would appear from programme outcome data that clinical aspects of patient management such as prescribing, content of regular checks, and regular laboratory testing are now all done well. Prompting from the presence of the items in the template may be responsible for much of this improvement in care. HbA1c outcomes require both good clinical management and patient self management and have been less affected by the programme. (Interestingly however, there are no rules around high HbA1c levels if the patient has had diabetes for less than five years.)

Clinical information systems

The development of robust IT systems has been somewhat delayed, a factor not uncommon in such complex programmes. IT issues were cited in the questionnaires as the second most common frustration with the programme. A lot of time and effort over the last year has gone into improving the IT aspects of the programme, including ensuring reliable transfer of data from the practices to the server. A number of problems, including delays in modifications to templates and ECDS, better error messaging, and more immediate ECDS are now about to be solved with the implementation of the new TIM system.

The original Five Year plan did not include electronic decision support but this is now an integral part of the programme. It should be noted, however, that there will need to be changes in the way practices process the templates and an increase in the uptake of the Health Intranet if TIM is to provide more effective ECDS.

There have been major delays in reporting. Accurate clinical and attendance reports have only been available since early in 2004. These reports are still not well utilised or understood as showed in the following table taken from the questionnaire data:

Question: Which of the following reports do you read and understand? (Only 28 – 32/47 replied to this Q)

	How often read?			How well understood?
a Clinical report – front sheet with tables	Monthly 28%	2-3 mthly 33%	Less often 43%	Not at all 1–2–3–4–5 Very well 2.9
b. Clinical report – pages with graphs	Monthly 25%	2-3 mthly 39%	Less often 36%	Not at all 1–2–3–4–5 Very well 2.7
c. Patient overdue and non attender report	Monthly 38%	2-3 mthly 31%	Less often 31%	Not at all 1–2–3–4–5 Very well 3.5
d. Clinical exception reporting eg creatinine	Monthly 23%	2-3 mthly 43%	Less often 33%	Not at all 1–2–3–4–5 Very well 3.0

From the above data it would appear that the patient attendance report is the one both most often used and best understood. Clinical reports are not well understood or regularly used by most respondents, so their potential for improving clinical outcomes through use in clinical governance activities is yet to be realised.

This is reflected in the questionnaire results regarding how often patient management or practice systems have been changed as a result of information in

the regular reports: 56% of respondents replied 'never', 5% 'annually', 24% quarterly and 12% monthly.

Organisation of health care

Some PHOs have lacked the CCM project management staff and clinical leaders required for effectively supporting practices to implement the programme and provide ongoing clinical governance. Others have put a great deal of resources into assisting both the development and implementation of the programme. The current PHO manual is three years old and is now in the early stages of being updated so as to provide a more effective resource for PHO managers. The new funding formula for PHO support ensures adequate funding of PHOs of all sizes and can be expected to result in a higher level of PHO support to practices.

In terms of links with secondary care there has been strong support from secondary care in the following ways:

- Contribution to governance and planning committees
- Participation in DSAGs
- Provision of education
- Clinicians providing outreach clinics
- Clinical nurse specialists providing education and support
- Establishment of nurse clinics
- Improved provision of eye screening for diabetes nephropathy

In regards to ensuring adequate funding, practices generally view the funding available for the programme as appropriate (only one questionnaire respondent mentioned lack of funding as a frustration with the programme). There are issues going forward with the new funding formula due to some PHOs or practices having limited Care Plus places available so these will need to be monitored carefully if this is not to become a barrier to enrolment.

Summary of implementation issues

This following table summarises the key aspects of the programme as described in the 2001-2006 Plan for CCM in Counties Manukau, within each pillar of the Wagner model, and how well that aspect has been implemented.

Pillar	Intended implementation	Actual implementation
Patient self management	Wellness plans Pt education Goal setting Cultural competence	Poor Reasonable Poor Delayed
Community linkages	Resource list in manuals	Lists present, use unknown
Delivery systems	Well organised practice systems	Varying
Decision Support	Electronic clinical decision support (ECDS) Education Folders	Delayed, now working well Patchy In place, now updated
Clinical information Systems	Templates ECDS Reports	Working well Delayed, now working well Delayed, still not well utilised
Organisation of health care	PHO support Links with secondary care Funding	Variable Strong Adequate

The aim of the Wagner Chronic Care model is that programmes will result in informed activated patients (and whanau) and prepared proactive teams. Has this been achieved? The current answer would have to be “partially”. The building blocks are all now in place, but as yet many practices have not fully understood the philosophy of the programme and many patients are not yet supported to adequately self manage their disease.

7. Conclusions

7.1 Summary

In summary the effectiveness of the programme in regards to the following key areas is as follows:

- Patient involvement (up to date with checks): Partially effective
- Patient outcomes: Effective
- Saved admissions and bed days: Not directly effective
- Implementation as planned: Partially
- Addressing inequalities: Partially

The programme has made good progress in addressing inequalities. The proportion of Maori and Pacific enrolled is considerably greater than that in the population as a whole. Prescribing rates for these ethnic groups of key preventive medications, such as statins, are as high, or higher, than that for other ethnicities.

Barriers to effectiveness that have now been removed include difficulties with templates, ECDS and accurate reporting. The benefits of better processes in these areas have yet to be realised.

Areas of continuing concern are: education and motivation of providers, support for patient self management (including cultural responsiveness), robust practice delivery systems, clinical governance systems (at the practice and PHO level) and community linkages.

The building blocks are all in place and these mirror the content of other successful disease management programmes. The challenge over the next year is to fully implement the programme and achieve the patient outcomes expected from the pilot practice results. It is unlikely that the predicted savings in bed days will ever be realised while the focus is on diabetes.

7.2 Recommendations

That the results of this evaluation be discussed with key stakeholders

That suggestions for changes to the programme that will increase its effectiveness be canvassed from key stakeholders

That a plan for improving the effectiveness of the CCM programme be put in place, to include key activities, timelines and accountabilities – see CCM Evaluation Plan

That an external evaluation be carried out in late 2005.

14. When are they sent in relation to the consultation?

At the end of the consultation - 49%, In batches at end of day - 26%, Weekly - 26%

15. Who monitors/manages the clinical advice messages from the server?

GP - 40% Nurse - 24% Manager - 10%

16. How often have you changed patient management as a result of clinical advice from the server?

Never Annually Quarterly Monthly Fortnightly Weekly
 40% 13% 28% 15% 3% 3%

31% of the GPs answering this question answered monthly or fortnightly, the rest less often.

17. What kind of changes to patient management have you made? 24 responded, 14 made medication changes, 8 changes in referral patterns, 6 changes in lifestyle counselling

18. Which of the following reports do you read and understand? (Only 28 - 32 relied to this Q)

	How often read?			How well understood?
a. Clinical report - front sheet with tables	Monthly 28%	2-3 mthly 33%	Less often 43%	Not at all 1-2-3-4-5 Very well 2.9
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d. Clinical exception reporting eg creatinine	Monthly 23%	2-3 mthly 43%	Less often 33%	Not at all 1-2-3-4-5 Very well 3.0

19. How often have you changed patient management or practice systems as a result of the regular reports?

Never Annually Quarterly Monthly Fortnightly Weekly
 56% 5% 24% 12% 0% 2%

20. What kind of changes have you made? 9 responded. 7 made changes to recalls and appointments systems, 2 started using CHW, 2 made changes to goal setting/pt info

Pt self management

(Only 33-36 /47 answered these 4 Qs, some practices gave conflicting answers)

21. What % of your patients have written Wellness plans? 44%

22. What % of your patients have written education material? 76 %

23. What % of your patients have written goals? 49 %

24. Do you run group education sessions? 2 PHOs answered Yes

25. What is your biggest current frustration with the CCM programme? 36 replies

Patient factors 11, IT 9, Time 7, Payments 6, Wellness plan 3

26. What is your greatest joy? 33 replies

Better patient outcomes 18, Improved self management 8, More regular care 7, Job Satisfaction 2, Team work 1,