



THE UNIVERSITY OF AUCKLAND
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Alleviating the Burden of Chronic Conditions in New Zealand (The ABCC NZ Study)

Report: Disease Specific Analysis

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Preface

This report acknowledges that health disparities for Maori are recognised to exist within a social, economic and cultural context as well as structural discrimination.

The involvement of Maori, the indigenous population of Aotearoa and Te Tiriti o Waitangi partner with the Crown, in the design of this research project is consistent with the Government's health strategy for Maori "He Korowai Oranga" that Maori are entitled and should have access to effective health services.

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Chapter 1: Introduction

Chronic conditions are the leading cause of morbidity and mortality in New Zealand, causing over 80% of all deaths. This burden is particularly evident in CVD, Stroke, COPD and CHF, and there are large inequalities in prevalence relating to social inequality and to ethnicity. The prevalence of such problems will rise exponentially over the coming decades. Current reactive models of primary and secondary healthcare cope poorly with this burden. Although international and some local evidence suggests that models of chronic conditions management (continuous care) can improve the healthcare experience and outcomes of those with chronic conditions, such models have not been widely translated into practice in New Zealand or elsewhere. This is, in part, because the complexity of care systems and their wider societal contexts makes local interpretation and application difficult for DHBs and other agencies. The driver for the research is the need to improve effectiveness and efficiency of services for those with chronic conditions.

A. Aims of the ABCC Study

The aims of the ABCC NZ Study are to maximise potential health outcomes and reduce inequalities for New Zealanders with chronic conditions (CVD, Stroke, COPD, CHF) by: conducting a review of wide-ranging literature; evaluating current DHB service provision and process against best practice; and producing an interactive and practical workbook for DHBs in order to facilitate service development in chronic care. In addition, the study aims to contribute to international debate on the generalisability and practical applicability of evidence-based recommendations on chronic care. Overall, the aims of the study are:

- To gain an evidence-based perspective
- To gain an experts' view on the current state of Chronic Care Management practice
- To provide a standard setting on what best practice looks like
- To evaluate current practice

B. Methodology of ABCC Study

A multidisciplinary and multidimensional project team approach was utilised, incorporating systems theory analysis and the iterative and inclusive methodology of Participatory Action Research within a 4-stage process, each stage of which informs the subsequent stage.

The four stages of the ABCC study are:

LITERATURE REVIEW

- Conduct a review of evidence-based literature for service provision and process
- Prepare a literature review document for submission to HRC/DHBNZ

STOCKTAKE

- Undertake a comprehensive Stocktake/review of current and past programmes targeting management of chronic conditions (access existing databases and a questionnaire to all DHBs)
- Undertake detailed analysis of programmes for COPD, CVD, CHF and Stroke
- Analysis, interpretation and standard setting
- Stocktake report for submission to HRC/DHBNZ

EVALUATION – Understand reason for success/failure

- Carry out observation, key informant interviews and focus group interviews across the country
- Integrate and analyse data
- Create dimensions of best practice for workbook

ESTABLISHMENT OF EAG AND DEVELOPMENT OF WORKBOOK AND IMPLEMENTATION SYSTEM

- Workshop with Expert Advisory Group (EAG) and Chronic Care Steering Committee to provide guidance to the research team on preparation and format of workbook
- Produce workbook for DHBs, under the guidance of the EAG.

C. Outline of this report

This report commences with the overview of the ABCC study as described above. Chapter 2 outlines the background and methodology for the Stocktake analysis. Chapters 3 to 6 provide a description of findings for each of the disease specific questionnaires. Overall conclusions are found in Chapter 7.

Chapter 2: Stocktake methodology

A. Stocktake Background

A literature review of chronic conditions management (CCM) in the New Zealand context was undertaken to examine the existing evidence-based, social science-based, and culture-based literature. The Stocktake was informed by this review. The review addressed global best practice regarding healthcare delivery for CCM, including foci on: [1] the applicable chronic care frameworks; [2] understanding and updating health needs related to chronic conditions; [3] current examples of relevant workbooks; [4] disease specific literature review extracting aspects that are particular to each disease. Advisors during this stage of the study included the project's Expert Advisory Group, and the project's Governance Group as well as the HRC. Figure 1 gives an overview of the process. As a consequence of the process a Stocktake instrument was developed to capture an overview of CCM programmes and their practices within New Zealand.

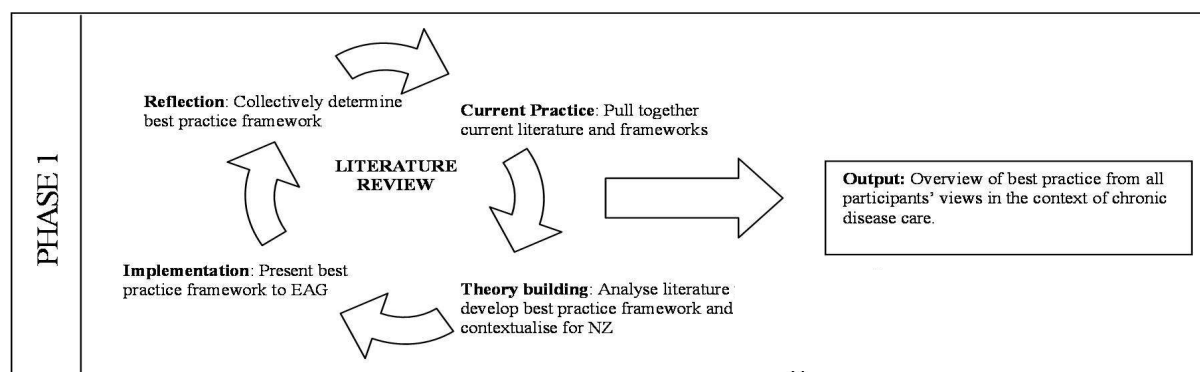


Figure 1: Overview of Phase 1 - Literature Review

B. Questionnaire Development

The CCM dimensions detailed below, identified by the Literature Review formed the basis of the Stocktake questionnaire. We subsequently held a series of five Standard Setting workshops involving CCM professionals across New Zealand (to be reported in detail later) which have validated our choice of dimensions. The Stocktake questionnaire was divided into two parts; firstly, a generic component that captured overall practice; and secondly, a disease specific component.

The dimensions are as follows:

1. Conceptual understanding of CCM
 - Patient empowerment
 - Patient self-management
 - Self-management education
2. Appropriate levels of collaboration
3. Active engagement of leadership
4. Appropriate development of sustainable community links
5. Focus on health inequalities
6. Decision support systems in place
7. Appropriate delivery design system
8. Knowledge transfer that is organised and appropriate
9. Attention to efficiency/cost/output

10. Attention to effectiveness outcomes
11. Adherence to clinical guidelines

The Stocktake questionnaire to DHBs was divided into two major components:

- [1] The Generic Stocktake (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study] Report: Generic Stocktake Analysis, May 2009) which comprised core questions around CCM, service process/integration, implementation catalyst and systems and response to cultural context.
- [2] The Disease Specific Stocktake (the current report).

The Stocktake development team comprised a senior clinician from each subject area, and representation from epidemiology, statistics, nursing, primary care, Maori health, Pacific health, IT and PAR expertise. MOH/ DHBNZ provided information extracted from the DHBs' District Annual Plans for the 2007/08 year.

The following diagram presents an overview of the Stocktake phase

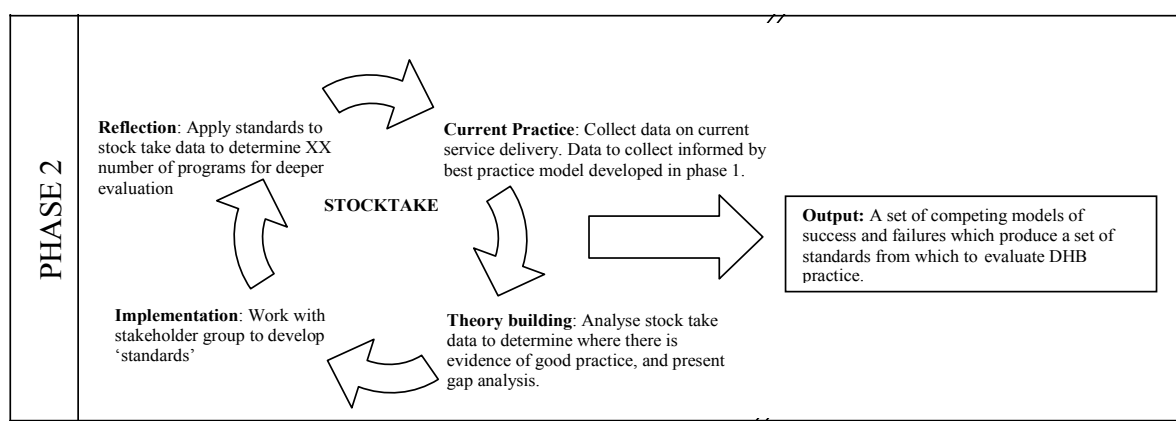


Figure 2: Overview of Phase 2 - Stocktake

The Generic and Disease specific sections of the Stocktake tool were circulated to the EAG and the questionnaire was modified as a result of feedback.

The Pilot

The tool was then piloted during July 2007 in two DHBs (Counties Manukau and Nelson Marlborough DHB). Feedback from the pilot sites included clarification regarding the ICD 10 codes to use for CVD, Stroke, COPD and CHF when extracting data from patient information systems; clarification as to whether 2006 referred to calendar or financial year; and using discharge rather than admission for the count as information is coded after the event, thus discharge information is more complete. The length and content of the Stocktake tool was also discussed and, as a result, the disease specific components of the Stocktake tool were refined and subsequently sent in two phases to all 21 DHBs:

1. Generic sections of chronic care management, primary care and health inequalities as well as the 'trunk' disease specific questionnaires
2. Tailored disease specific questionnaires based on the trunk questionnaire information provided.

Four regional workshops were held during September 2007 to review the study and gain feedback on the questionnaire tool content;

- Auckland

- Rotorua
- Wellington
- Christchurch

Workshop areas were:

- Clinical decision support/ IT
- Nature of team work/ organisational design
- Self management
- Access/ inequalities
- Community linkages

These workshops were also used to promote and publicise the study to DHBs, PHOs and NGOs.

Ethics

Ethical approval was sought via the expedited process through the Multi-region Ethics Committee. The study MEC/07/21/EXP was approved on 28 June 2007.

C. Disease Specific Stocktake dissemination

The Disease Specific Stocktake tool was disseminated to all 21 DHBs on 16 October 2007

Stocktake response rate

Only one DHB (extra to the pilot sites) responded by the due date¹. During December three DHB's advised the project of their decision to decline to participate and two DHBs did not respond at all. Several advised they would be delayed. Those that did return the Generic and trunk Disease Specific questionnaires had the appropriate second tailored disease specific questionnaires sent to them. By February 2008 the response rate of the remaining 18 participating DHB for the Disease Specific component of the questionnaires had increased to 7 for CHF, 8 for CVD, 6 for COPD and 9 for Stroke. Over subsequent months the project manger continued to correspond, talk and visit the delayed DHBs in an attempt to improve the response rate. A common reason for delay was competing demands on DHB resources such as having to prepare their District Annual Plans. By July 2008 the response rate of the remaining 17 participating DHB for the Disease Specific component of the questionnaires had increased to 11 for CHF, 13 for CVD, 10 for COPD and 11 for Stroke (see Table 1).

¹ The original plan was for DHBs to return the completed Stocktake questionnaires by the end of November 2007.

Table 1: Overview of Questionnaire Response Rate (July 2008)

GENERIC QUESTIONNAIRES			FOUNDATION DISEASE-SPECIFIC QUESTIONNAIRES				COMPREHENSIVE DISEASE-SPECIFIC QUESTIONNAIRES		
CCM Inventory	Primary Care	Health Inequalities	CVD ²	CHF ³	COPD ⁴	STROKE ⁵	CVD	CHF	COPD
88%	71%	88%	76%	82%	88%	75%	65%	76%	59%

Fifteen DHBs completed and returned a full set or parts of the questionnaires, a response rate of 88% (of 17)⁶. [NB. This figure, however gives a more favourable impression of overall response rate than is justified. As will become apparent later in the present report, and was also the case in the Generic Stocktake Report published separately, many of the responses submitted were incomplete]. The questionnaires were filled out by knowledgeable personnel including senior clinicians, service heads (clinical and managerial), Maori general managers/ liaison workers, and senior funders and planners within the DHB. Pacific and Asian general managers also completed relevant sections of the questionnaire.

D. Data Analysis

This report contains the analysis findings of the Disease Specific Questionnaire components of the Stocktake relating to DHBs. Descriptive statistics were performed on the four index disease questionnaires, and where appropriate, frequencies, percentages and central tendencies (mean) were calculated. All statistical analyses were conducted using SPSS version 15.0. Qualitative analysis was performed on qualitative responses. Coding of text responses was performed where necessary.

² **The DHBs that participated in the CVD Stocktake were:** West Coast DHB, South Canterbury DHB, Wairarapa DHB, Hutt Valley DHB, Northland DHB, Southland DHB, Nelson Marlborough DHB, Hawkes Bay DHB, Counties Manukau DHB, Waitemata DHB, Waikato DHB, Otago DHB and Canterbury DHB

³ **The DHBs that participated in the CHF Stocktake were:** South Canterbury DHB, Wairarapa DHB, West Coast DHB, Hutt Valley DHB, Nelson Marlborough DHB, Hawkes Bay DHB, Northland DHB, Southland DHB, Canterbury DHB, Otago DHB, Counties Manukau DHB, Waitemata DHB, Waikato DHB and Auckland DHB

⁴ **The DHBs that participated in the COPD Stocktake were:** South Canterbury DHB, Wairarapa DHB, West Coast DHB, Mid Central DHB, Southland DHB, Nelson Marlborough DHB, Hawkes Bay DHB, Northland DHB, Hutt Valley DHB, Otago DHB, Counties Manukau DHB, Waitemata DHB, Canterbury DHB, Auckland DHB and Waikato DHB

⁵ **The DHBs that participated in the STROKE Stocktake were:** South Canterbury DHB West Coast DHB Wairarapa DHB Hutt Valley DHB Mid Central DHB Nelson Marlborough DHB Hawkes Bay DHB Northland DHB Southland DHB Canterbury DHB Counties Manukau DHB Waitemata DHB Waikato DHB and Auckland DHB.

⁶ **The DHBs that participated in the Generic Stocktake were:** Auckland DHB, Bay of Plenty DHB, Canterbury DHB, Counties Manukau DHB, Hawkes Bay DHB, Hutt Valley DHB, Northland DHB, Nelson Marlborough DHB, Mid-Central DHB, Southland DHB, Otago DHB, Waikato DHB, Wairarapa DHB, Waitemata DHB and West Coast DHB,

Chapter 3: CVD Analysis

For the purposes of the ABCCNZ study, CVD (cardiovascular disease) excludes cerebrovascular disease and peripheral vascular disease. Cerebrovascular disease is addressed separately as 'stroke'. The CVD questionnaire was completed by 13 DHBs⁷. The DHBs were clustered by size for ease of analysis⁸. Overall there were three groups consisting of three small (DHB: C, G, Q), five medium (DHB: B, L, K, H, F) and five large DHBs (E, I, A, N, P). This breakdown is in accordance with the MoH breakdown by population. The following section describes the analysis of these questionnaires. The analysis considers an overview of patient demographics and services provided.

DHB size	DHB code
Small	C, G, Q
Medium	B, L, K, H, F
Large	E, I, A, N, P
Total	13

A: Demographic information

Two medium DHBs (K, F) were unable to respond to this section. DHB F was unable to respond to this section as they had been coding (ICD-10) acute coronary syndrome (ACS) incorrectly resulting in no patients with a primary diagnosis of ACS as per the relevant ICD-10 codes being recorded as admitted to hospital between 1/07/06 and 30/6/2007. They were unaware of this error until we alerted them to it. In the other 11 DHBs, there was a mean of 1517 patients per DHB with ACS admitted as inpatients in 2006. Large DHBs had a higher number of inpatients (mean= 2584 patients, range 849 to 6294 patients) than medium DHBs (mean= 879 patients, from 508 to 1228 patients) and small DHBs (379 patients, range 132 to 707 patients).

Across the 11 DHBs with recorded data, more males (58%, range 40% to 65%) than females (42%, range from 35% to 59%) with ACS were admitted as inpatients. NZ Europeans comprised 79% (range from 47% to 98%) of all inpatients admitted with ACS in 2006, 7% (range from 1.3% to 19.5%) were Maori, 2.8% (range from 0 to 15%) were Pacific, 1.5% (range from 0% to 5%) were Asian patients and 10% (range from 0% to 28%) were 'Other ethnicity'. The mean ages of patients with ACS were 71 years for NZ European patients (range 69 to 73), 69 years for 'other ethnicity' patients (range 64 to 74), 61 years for Asian patients (range 54 to 69), 60 years for both Maori (range 55 to 64) and 59 years for Pacific (range 46 to 72) patients.

Admission

Almost two thirds (61%) of patients with ACS were initially admitted to general medical wards, 32% of patients to cardiology units, 1.5% of patients to older people's health units, and 7% to other departments (including intensive care and surgical).

⁷ DHBs that are included in this analysis are: C, G, Q, B, F, H, L, K, A, E, I, N and P

⁸ DHBs were categorised into small, medium and large DHB by provider arm revenue. The MoH used the same classification for the 'DHB hospital Benchmark information report (March 2008)'.

Patient Management

Patients with ACS were largely managed on coronary care units-CCU (40%) and general medical wards (32%), while 18 % were managed on cardiology wards. Lower percentages were managed on Intensive Therapy/Treatment Units (1.5%) or in geriatrics services (2.5%). Three DHBs (small: G; medium: K, F) did not provide this data.

Audit processes

Seven out of 13 (54%) DHBs (medium: B, L, K, H; large: I, A, N) reported their DHB had audit processes or quality improvement programmes for the management of patients admitted with ACS. Four DHBs (31%; small: C; medium: F; large: E, P) reported the converse and two DHBs (small: G, Q) did not respond.

Those that had audit processes or quality improvement programmes provided details of clinical indicators used, as follows:

Medium DHBs

- *National Audit pathway. (B)*
- *Many clinical indicators are used. (L)*
- *MI Pathways- door to needle time; Low risk pathway-audit; AF audit. (K)*
- *Door to needle; use of ASA; use of statins; B blockers at discharge. (H)*

Large DHBs

- *Intermittent but not rolling audit (too expensive). Indicators- "door to needle time." (A)*
- *International Grace Registry. (N)*

B: Staffing

Overall leadership in cardiology

Nine DHBs (69%; medium: B, H, L, K; large: A, I, N, P, E) reported they had an individual with overall leadership in cardiology, and 4 DHBs (small: C, G, Q; medium: F) reported they did not.

Cardiology department

Seven of 13 DHBs (54%; medium: B, K; large: I, A, P, N, E) had a cardiology department, six of 13 DHBs (46%; small: C, G, Q; medium: L, H, F) did not.

Staffing level

In total, seven DHBs provided staffing levels (FTEs) across the cardiology department, although no small DHBs responded.

For medium DHBs, DHB B reported 29.4 FTEs of staffing, comprising 2.4 FTEs of cardiologists, 21 FTEs of nursing, 4.5 FTEs of cardiac technicians/scientists and 1.5 of administrative staff. DHB L had a total of 13.3 FTEs, encompassed of 2 FTEs of Cardiologists, 2 FTEs of Nursing, 6.79 FTEs of Cardiac Technicians/ scientists and 2.5 FTEs of Health Educators.

In terms of large DHBs, DHB N had 91 FTEs in total, these included 12 FTEs of cardiologists, 65.8 FTEs of nursing, 0.5 FTE occupational therapist, 0.5 FTE physiotherapist, 11.7 FTEs of cardiac

DHBs classified by size: Small: C, G, Q, Medium: B, D, L, K, H, F, Large: E, A, I, M, N and P

technicians/scientists and 0.5 FTE dietician. DHB E had 163 FTEs including 8.5 FTEs of cardiologists, 17.5 FTEs of nursing in service, 82.2 FTEs of nursing in ward, 21.6 FTEs of cardiac technicians/scientists, 16.5 FTEs of administrative staff and 16.7 FTEs of other staffing. DHB I reported having 71 FTEs, including 8.3 FTEs of cardiologists, 42.8 FTEs of nursing, 15.5 FTEs of cardiac technicians/scientists, 4.3 FTEs of administrative staffs and 0.2 FTE health psychologist. DHB A reported a total of 27 FTEs, including 8 FTEs of cardiologists, 1.8 FTEs of nursing, 0.1 FTE physiotherapist, 12.7 FTEs of cardiac technicians/scientists, 0.1 FTE dietician and 4.4 FTEs of administrative staff. DHB P reported a total of 20.6 FTEs which were comprised of 4.4 FTEs cardiologists, 5.7 FTEs in nursing, and 10.5 FTEs of cardiac technicians/scientists.

Protocols or endorsed guidelines for the management of ACS

Ten DHBs (77%) had protocols or endorsed guidelines for the management of ACS, two small DHBs (15%; C and Q) reported the opposite and one large DHB (P) did not respond.

C: Risk Stratification and Resources

Exercise tolerance testing

All 13 DHBs had access to exercise tolerance testing (ETT) within their DHB.

Patient demographic information

Six of 13 DHBs (small: C, G; medium: K, H, F and large: N) did not provide this data. Of the remaining seven DHBs, 58% of patients who accessed ETT were male and 42% were female. These patients were mostly New Zealand European (70%), 5% were Maori, 4.3% were Pacific, 2.7% were Asian and 19% were of 'other ethnicity'. The mean age of NZ European patients was 57 years, the mean ages of both Maori and Pacific were 55 years, that of Asian patients was 53 years, and of 'other ethnicity' patients was 58 years.

Referral process

All nine respondent DHBs reported that their ETT service was open to referral from hospital physicians. Four (small: C; medium: B, H; large: E) also welcomed referral from primary care. Six DHBs (small: C; medium: B, L, H; large: E, I) also received referral from other specialists. Four DHBs (small: G, Q; medium: K, F) did not respond.

Waiting time

Inpatients: Small DHBs: DHB G reported nil waiting time and DHB C reported a one week (unless considered urgent) waiting time. DHB Q did not respond. Medium DHBs: The waiting time in DHB B was reported as 'days' and in DHBs L and H the waiting time was reported as being less than one day. DHBs K and F did not respond. Large DHBs: three DHBs (A, P, N) ranged from one to three days. DHB E reported 'less than two weeks' of waiting time. The other DHB (I) did not respond.

Outpatients: Small DHBs: one reported a waiting time of one month (G) and the other (C) four to six weeks. DHB Q did not respond. Medium DHBs: waiting time for three DHBs (B, L, H) ranged from six to eight weeks. DHBs K and F did not respond. Large DHBs: 'less than two weeks' (E), 'triage dependent but majority < 4 weeks' (P), four to six weeks (I), three months (A), and one to four months (N).

Echocardiography

Twelve (of 13) of the respondent DHBs (92%; small: C, G; medium: B, H, F, L, K; large: I, A, N, P, E) reported they offered echocardiography. The other (Q) referred their patients to an adjacent DHB.

Demographic information

Of the 12 DHBs that offered echocardiography only six were able to provide some or all of the demographic information of the patients who access the service in 2006. Seven DHBs (small: C, G, Q; medium: K, H, F; large: I) did not provide demographic data.

Among the six respondent DHBs, 53% of the patients who accessed echocardiography were male and 47 % female. Only five DHBs provided detail on patients' ethnicity and age. Across these DHBs; most patients were NZ European (66%), followed by 'other ethnicity' (16%), Maori (9%), Pacific (7%) and Asian (2.5%). The mean ages of patients were 61 years for NZ European, 62 years for 'other ethnicity', 52 years for Pacific, 51 years for Asian, and 47 years for Maori.

Referral process

Three DHBs (large: I, P and A) reported they accepted referral from hospital physicians only. Two DHBs (medium: L; large: N) accepted referrals from hospital physicians and other specialists and one small DHB (G) accepted referral only from other specialists and primary care. Five DHBs (small: Q, C; medium: B, H; large: E) accepted referral from hospital physicians, primary care and other specialists. Medium DHBs K and F did not respond.

Waiting time

The current waiting time for echocardiography for inpatients was cited by small DHBs to be nil (G) or same day if possible given consultant is available (C). The inpatient waiting time in medium DHBs was reported as being on request within the same day (H), less than 24 hours (L), and 'days' (B), with two DHBs (K and F) not responding. The reported waiting time for an inpatient echocardiogram within large DHBs started at one day (E), one to five days (N), and less than one week (P), resulting in a range of one to seven 7 days. One DHB (I) reported having no data priority determined and DHB A did not respond.

The waiting time for echocardiography for outpatients varied considerably. In small DHBs, one DHB (G) reported the current waiting time was two to four weeks and another DHB (C) reported two weeks if urgent and three to four months for non-urgent patients. For medium DHBs, waiting times included ten days (L), six to eight weeks (H) or eight weeks (B), DHBs K and F did not respond. For large DHBs, the waiting time ranged from one month (E) to a range of one to twelve months (N). DHB P stated that their waiting time is priority determined, with the first priority being one to four weeks, the second priority being four to eight weeks, and the third priority being two to three months. DHB I reported a six months maximum wait. DHB A did not respond.

Coronary Angiography

Six DHBs (46%; medium: L, K; large: P, I, N, E) offered coronary angiography and seven DHBs (54%; small: C, G, Q; medium: B, F, H; large: A,) did not. However, six of these latter seven DHBs have a designated DHB to which they refer their patients. The remaining medium DHB (F) did not provide any details of where they refer their patients.

Demographic information

Four of six DHBs (medium: L; large: E, I, P) that offered coronary angiography provided demographics. The other DHBs (N and K) did not respond to this section. Based on the available data, a mean of 64% patients who accessed this service were male and 36 % were female. Most patients were NZ European (67%), followed by 'other ethnicity' (22%), Maori (6%), Pacific (4%) and Asian (1.5%). The mean ages of patients who accessed coronary angiography by ethnicity were 64 years for NZ European, 54 years for Asian, 57 years for Maori, 52 years for Pacific and 64 years for 'other ethnicity.'

Waiting time

A medium DHB (L) reported that the waiting is within 48 hours for inpatients angiography. As for the four large DHBs offering this service, the waiting time for inpatient angiography ranged from within the same day to seven days. For outpatients, the waiting time range from four weeks to nine months. A medium DHB (K) offering this service did not respond on waiting time.

Percutaneous Coronary Intervention

Four DHBs (31%; large: P, I, N, E) reported they had Percutaneous Coronary Intervention available within the DHB. Nine (69%) reported the opposite; however, patients who required this service were referred to another DHB for the intervention.

Demographic information

Three of the four DHBs (I, P and E) provided demographic information of patients who accessed the service in year 2006. Most (70%) of the patients admitted for a Percutaneous Coronary intervention were male and 30% were female. Of those patients, 66% were NZ European, 6% were Maori, 4.2% were Pacific, 1.5 % were Asian and 23% were from other ethnicities. The mean ages of these patients were 64 years for NZ European, 53 years for Pacific, 51 years for Asian, 52 years for Maori and 65 years for 'other ethnicities.'

Waiting time

All four DHBs (P, I, N, E) reported current waiting times for a Percutaneous Coronary intervention. The current waiting time for inpatient is on average three days (range one to seven days), with the waiting time for outpatients between one to six months.

Coronary Artery Bypass Grafting

Three of 13 DHBs (23%; large: P, N, E) reported they offer Coronary Artery Bypass Grafting (CABG) at their DHB. Ten DHBs (77%; small: C, G, Q; medium: B, F, L, K, H; large: I, A) reported they did not offer this service. However, all of these ten DHBs reported that patients who required CABG were referred to another DHB.

Demographic information

Only two DHBs (E and P) offering CABG provided demographics of the patients who accessed the service in 2006. Seventy-one percent of patients who had CABG were male and 29% were female. The majority of these DHB's patients were NZ European, accounting for 79%, 14% were 'other ethnicity', 3.4% were Maori, 1.6% were Pacific and 1.5% were Asian. The mean ages were 68 years for NZ European, 68 years for Asian, 60.5 years for Maori, 56 years for Pacific and 67 years of age for 'other ethnicity'.

Current waiting time for this service

All three DHBs (P, E, N) providing CABG returned waiting time information. The waiting time for a coronary artery bypass grafting surgery for inpatient from admission was 1 to 14 days. Outpatient waiting time was 3 to 12 months.

D: Cardiac rehabilitation service

All 13 DHBs offered cardiac rehabilitation to their patients.

Demographic information

Six DHBs (46%: small C; medium: B; large: I, A, E, P) provided demographic information of their patients who had received cardiac rehabilitation during 2006, although one of among these (P) was only able to provide gender data. The rest of the DHBs did not complete this section, with one (G) reporting that the information was unavailable.

From the available data, 66% of the patients who received cardiac rehabilitation were male and 34% female. Most were NZ European (67%), 8% were Maori, 5% Pacific, 3% Asian and 17% from other ethnicities. The mean ages of patients receiving rehabilitation were 66 years for NZ European, 58 years for Maori, 54 years for Pacific, 59 years for Asian and 65 years for 'other ethnicity'.

Referral process

Ten DHBs (small: C, G, Q; medium: H, L; large: P, I, E, N, A) responded to this question. Eight (small: C, G, Q; medium: H, L and large: I, E, P) said their rehabilitation service was open to referral from hospital and primary care physicians. Two large DHBs (A and N) accepted referral from hospital physicians only. Three medium DHBs (B, K, F) did not respond.

Staffing levels

In total, ten DHBs reported their staffing levels for cardiac rehabilitation service. For small DHBs, DHB G reported one FTE Cardiac Nurse Specialist. DHB C reported 1 FTE (One staff member is 0.8 FTE and the second member is 0.2 FTE). These staff cover cardiac outreach service but the class runs only for 2 hours. As for medium DHBs, DHB B reported having 1.7 FTEs of staffing. DHB L had 2.5 FTEs of health educators for their cardiac rehabilitation service. DHB H had in total one FTE of nursing for this service split between 0.4 Cardiac Rehab Nurse and 0.6 Cardiac Nurse Specialist/ Registered Nurse. In terms of large DHBs, DHB N reported they had 1.3 FTEs cardiac nurses providing Phase I and II cardiac rehabilitation. DHB I reported 1.2 FTEs of Clinical Nurse Specialist and 0.26 FTE Registered Nurse. DHB P reported 0.9 FTE Inpatient Cardiac Rehabilitation Nurse Specialist and 0.1 FTE outpatient heart failure programme. DHB A reported they had five nurses at 0.6 FTE each. Lastly, DHB E had 1.8 FTEs of staffing for rehabilitation service. DHB Q, F and K did not respond to this question.

Duration and content of the programme

One medium DHB (H) reported their programme could last up to 26 weeks, but within the remainder of respondents, the duration varied from four to 12 weeks (mean 6.5 weeks). Of these, one small DHB reported five weeks (C), five reported six weeks (medium: L; large: I, A, N, E), two small DHBs reported seven weeks (G and Q), one reported eight weeks (B), and one large DHB reported a range of four to 12 weeks (P). DHBs were asked whether their rehabilitation programme offers endurance training and/or strength training. Four DHBs (small: G; large: P, I, E) reported their programme

offered both endurance training and strength training. One DHB (B) said the provided endurance training only, while the rest (small: C; medium: L, H; large: A, N) reported they did not offer either endurance training or strength training. Three DHBs (small: Q; medium: K, F) were unable to respond to this portion.

Programme base

Ten DHBs responded; the rehabilitation programme of five DHBs (38%; small: G; medium: B, H; large: E, I) was both hospital and community-based. The rehabilitation programme of the other five DHBs (38%; small: C, Q; medium: L; large: A, P) was hospital-based only. One large DHB (N) was community-based only. Two medium DHBs (K and F) did not respond.

Ongoing home based exercise programme

Four DHBs (31%; medium: H; large: I, N, E) offered an ongoing home based exercise programme, whereas seven (54%; small: C, G, Q; medium: B, L; large: A, P) reported they did not and two (15%; medium: F, K) did not respond.

Any other forms of ongoing support

Nine DHBs (69%; small: C, G, Q; medium: B, H; large: E, P, N, I) reported that they offered other forms of ongoing support, two DHBs (15%; L and A) reported the opposite. The remainder did not respond.

Other community-based services

Similarly, nine DHBs (69%; small: C, G; medium: B, H; large: I, P, E, N, A) said that they offered other community-based services; one (15%; L) reported they did not. The remainder (Q, K and F) did not respond.

DHBs typically received their funding through recurrent (guaranteed) support; eight of 13 DHBs (62%; small: C, G; medium: B, L, H; large: A, P, E) fell into this category. One large DHB (I) reported funding through a combination of recurrent and limited time project support. The remainder (31%; Q, N, K, F) did not respond. DHB E reported they were also piloting a limited-time project. Eight of 13 DHBs (62%; small: C, G; medium: B, L, H; large: I, P, E) reported there was an overall funding for the cardiac department, from which the cardiac rehabilitation programme received their funding. One large DHB (8%, A) reported receiving ring-fenced, specific funding for its cardiac rehabilitation programme. Four (31%; small: Q; medium: F, K; large: N) did not respond.

Total annual funding for Cardiac Rehabilitation

Only three DHBs responded. A small DHB (G) that had been receiving recurrent (guaranteed) funding reported receiving an overall funding of \$85,000 for the current year. A medium DHB (L) which reported receiving recurrent (guaranteed funding) and overall funding reported they did not know their current total annual funding for this service. A large DHB (I), which had been receiving a combination of recurrent and limited time project funding, indicated that they received an overall funding of \$9,255,000.

Audit process or quality improvement programme for Cardiac rehabilitation service

Six of 13 DHBs (46%; small: G, C; medium: B; large: A, I, N) had an audit or quality improvement programme for cardiac rehabilitation. Three (23%; medium: H; large: P and E) said they did not, while four (31%; Q, F, L, K) did not respond.

Those that had such a process or programme provided details of clinical indicators used, as follows:

Small DHBs

- *Patients were sent evaluation forms and responses were analysed (G)*
- *Audit process is in the format of a questionnaire which is given to patients attending Cardiac Rehabilitation classes. The questionnaire was based on the guidelines standardised by the NZ Heart Foundation. They followed the Essential data suggested by the Heart Foundation but were currently trying to work with IT to improve the data they collect and store (C)*

Medium DHBs

- Patient satisfaction surveys, HAD questionnaires (B)

Large DHBs

- Class participants are given anonymous evaluation forms to complete with SAE to send after attending classes. Database for ACS pts referred to Cardiac Rehabilitation Nurses (N)
- Attendance by age and ethnicity (A)
- New patients, readmissions records, DNAs (I)

E. Smoking cessation

Ten DHBs reported they offered smoking cessation services (small: Q, C; medium: B, F, L, K, H, large: I, A, N). Three (small: G; large: E, P) reported they did not – however, DHB G reported smoking cessation service was previously offered but its contract expired in mid 2007 and wasn't renewed by MOH).

Demographic information

Although ten DHBs offered smoking cessation service, only DHB Q (small) and L (medium) provided demographic information of the patients that accessed the service. Two large DHBs (A and N) reported that demographic information was unavailable, one small DHB (C) reported that they were unable to provide data, and five did not respond. From the available data, it was found that 62% of the patients who received smoking cessation service were female and 38% were male. For these two DHBs most patients were NZ European (72%, range 59% to 85%), followed by 'other ethnicity' (25%, range 8% to 41%), Maori (9%, range 5% to 14%), Pacific (0.5%, range 0% to 1%) and Asian 0%. Mean ages by ethnicity were 49 (range 45.6 to 53) years for patients from 'other ethnicity,' 45 (range 42 to 49) years for NZ European, 36 (range 30 to 42) years for Maori and 26 years for Pacific (in DHB Q only).

Referral Process

Three DHBs (small: C, Q; and medium: L) reported that their smoking cessation service was open to referral from both hospital and primary care physicians. One large DHB (A) accepted referrals from hospital physicians only. Six DHBs (B, H, F, I, K, N) did not respond.

Staffing levels

Three DHBs reported the staffing levels of their smoking cessation service. DHB C (small) reported there was no hospital service, but was currently advertising for 0.5 FTE staffing who will accept referrals from the hospital and make referrals to Primary Care. This DHB also reported 2 FTE, all GP practices have at least 1 trained Quit coach (usually a practice nurse). DHB Q (small) reported they

had 1.5FTEs level of staffing for smoking cessation service. DHB L (medium) reported approximately 1 FTE of staffing and had a smokefree hospital coordinator (1.15 FTE; not specific to disease area). The rest of the DHBs (except for DHBs G, P, and E, which did not have smoking cessation service) did not respond.

Funding for smoking cessation service

Of those 10 DHBs who offered smoking cessation service, three (30%; small: C, Q; medium: L) reported receiving funding on a recurrent (guaranteed) basis. One large DHB (I) received funding through a combination of recurrent and limited time project support. The remainder (60%; medium: B, H, F, K; large: A, N) did not respond. One small DHB (C) reported smoking cessation activities were funded as part of overall funding for the cardiac department. Two DHBs (20%; Q, L,) received ring-fenced funding.

Total annual funding for smoking cessation programme

Only three DHBs responded to this question. A small DHB (Q) that received recurrent (guaranteed) and specific funding reported the amount of annual funding was unknown. A medium DHB (L) which received recurrent (guaranteed) funding said they received specific funding of \$73,038 in the current year. A large DHB (N) which did not respond on recurrent or limited funding reported they did not know their annual funding for this service.

Audit process or quality improvement programme for smoking cessation programme

Two DHBs (20%; small: C; medium: L) said they did not audit the service. The other eight (80%) did not provide this data.

F: Dietician Service

Eleven DHBs (85%; small: G, C; medium: B, H, F, L, K; large: A, N, P, and E) provided a dietician service for their cardiac patients. DHB K specified that theirs was an inpatient/ or through cardiac rehab programme. DHB N mentioned that dieticians see all diabetic patients and those with special needs, but not all cardiac patients individually. This DHB also mentioned running weekly classes for all inpatients to attend, along with an outpatient session once every six weeks. One DHB reported it did not offer such service (I), although it did indicate that it offers a formalised referral process to primary care for this service. This DHB also stated that dietetic advice and education is available, but not as a specific or dedicated service. One DHB (Q) was unable to respond.

Demographic information

No demographic information was provided by the eleven DHBs with a dietician service.

Referral Process

Four DHBs (36%; small: G, C; medium: L; Large: E) reported that their dietician service was open to referral from both hospital physicians and primary care. Two medium (B and H) and two large (A and P) DHBs (36%) stated that their dietician service was only open to hospital physicians. Three DHBs (medium: F, K; large: N) did not respond.

Staffing Levels

DHB G reported that their dietician service is absorbed into the 1.5 FTEs dieticians employed by the DHB. DHB C had 2 FTEs of staffing levels supporting this service, in which 0.5 FTE was dedicated to

community work. In terms of medium DHBs, DHB H said the DHB employs 5.7FTEs for all its patients (i.e. including child health, community rehab, renal, professional advisor, diabetes centre and medical ward.) DHB L cited that there is no disease specific dietician service, the dieticians work across the hospital. As for large DHBs, DHB A and DHB E respectively reported 0.1 FTE and approximately 0.5 FTEs of staffing levels supporting this service. DHBs F, K, N, B and P did not provide this data.

Funding for Dietician service

Seven of 11 DHBs (64%; small: C, G; medium: H, L; large: A, E, P) reported they received recurrent (guaranteed) support for their dietician service. In five of these DHBs (45%; small: C, G; medium: H, L; large: P) the dietician service was funded as part of the overall funding for the cardiology department. Two large DHBs (A, E) received specific funding for their dietician service. Four DHBs (medium: B, F, K; large: N) did not provide this data.

Audit process or quality improvement programme for dietician service

One (9%; A) large DHB reported they had an audit process or quality improvement programme for their dietician service but did not detail clinical indicators used. Four DHBs (small: C; medium: H; large: E, P) reported they did not have an audit process for this service. Six DHBs (B, G, F, L, K, N) did not provide this data.

G. Cardiac Patient Self Management and Education Programmes

Nine DHBs (69%; small: C, G; medium: B, H, F, K; large: I, N, E) reported they offered cardiac patient self-management and education programmes. Four DHBs (31%) reported the opposite (small: Q; medium: L; large: A, P). All DHBs with self management and education programmes had written action plans. Three gave further details about their written plan:

- *Heart Guide Aotearoa (HGA) home based pilot programme. Our service is piloting this programme and at present...the number of patients who have enrolled in the programme is 81. Our expected target for HGA ending January 2008 is 100 patients, this is well within our goals (F)*
- *Plans are evidence-based and formulated by local Heart Foundation (K)*
- *Inpatient education is undertaken by CCU/ Ward nursing staff- limited by their resources (i.e. time and experience). Action plan (for angina) is written and emphasised by staff before discharge. Educational material given to patients (and reviewed by cardiac rehab Nurse) contains guidelines re activity- walking; work; driving; sex. Info regarding medication also provided. Medication card also prepared by pharmacist for self managing medications. (N)*

Demographic information

Six DHBs (small: C, G; medium: F, K; large: I, N) did not provide this data. In total, three DHBs (33%; medium: B, H large: E) provided the demographic information of the patients that accessed the service in 2006.

A mean of 59% (range 50% to 64%) of patients who accessed self-management and education programmes were male and 41% (range 36% and 50%) were female. Most patients were NZ European (72%, range 60% to 84%); 18% (range 7% to 17%) were from 'other ethnicity', 12% (range 3% to 20%) were Maori; 3% (1% to 7%) range were Pacific; and less than 1% (0% to 2%) were Asian.

DHBs classified by size: Small: C, G, Q, Medium: B, D, L, K, H, F, Large: E, A, I, M, N and P

The mean ages of patients by ethnicity were 68 years (range 66 to 72) for NZ European, 66 years (range 57 to 69) for 'other ethnicity', 63 years (range 57 to 69) for Asian, 60 years (range 58 to 64) for Maori and 57 years (range 55 to 59) for Pacific patients.

Referral process

Two DHBs (small: G; large: E) accepted referral from both hospital physicians and primary care. Two medium DHBs (B and H) received referrals from hospital physicians only. One small DHB (C) reported their service was open to referral from primary care only. Four DHBs (44%) did not respond.

Staffing Levels

DHB G reported one FTE clinical nurse specialist (cardiac) supporting patient self-management and self-education programmes. DHB C had 1 FTE clinical nurse specialist and practice nurse (care plus). For medium DHBs, DHB B reported having staffing levels of 0.8 FTE of rehabilitation. DHB H had 0.7 FTE of cardiac nurse educator. A large DHB (E) reported they had 1.8 FTEs of nurses supporting this service. Four DHBs (F, K, I, N) did not respond.

Funding for patient self-management and self-education programmes

Four DHBs (small: C, G; medium: H; large: E) reported that they received recurrent (guaranteed) support. One large DHB (I) received a combination of recurrent and limited time project support. Four DHBs (B, F, K, N) did not respond. Six DHBs (67%; small: C, G; medium: B, H; large: I, E) reported that their patient self-management and self-education was funded through overall funding for the department. Three DHBs (33%; F, K, N) did not respond.

Audit process or quality improvement programme for patient self-management and education service

One medium DHB (B) had an audit process or quality improvement programme for their patient self-management and education service. This DHB used Patient Satisfaction Surveys and Hospital Anxiety and Depression questionnaire as indicators. Four DHBs (44%; small: C, G; medium: H; large: E) reported that they did not audit this service and four DHBs did not respond (F, K, I, N).

H. Case management for CVD

Six DHBs (small: G, medium: B, L, K, Large: I, A) operated case management for CVD patients. Of these, three DHBs gave additional comments: one (B) reported that case management was limited to multi-co-morbid frequent flyers; another DHB (G) stated that all patients are case managed by Clinical Nurse Specialist within cardiac; another DHB (K) said their case management was limited by time constraints and limited staff resources. Seven DHBs (small; C, Q, medium; H, F, large; N, E, P) did not operate a case management for CVD, one of which (E) further explained that Heart guideline Aotearoa Project had a case management component; this is a one year pilot. DHB N also noted that providing case management for CVD was impossible given the volume of patients dealt with, although a core management programme is offered for brittle heart failure patients.

Demographic information

Only one DHB (B) provided demographic information, while the remaining five DHBs (83%; small: G, medium: L, K; large: I, A) did not respond.

For the DHB that provided demographic information, 65% of the patients were male and 35% were female. Sixty-six percent of the patients were NZ European and their mean age was 65 years, 16% were from other ethnicity; their mean age was 66 years, 10% were Maori; their mean age was 56

years, 5% were Pacific; their mean age was 56 years and 3% were Asian; their mean age was 71 years.

Referral process

Three DHBs (small: G; medium: L; and large: I) reported that their case management service was open to referral from hospital physicians and primary care. One large DHB (A) said that they only accept referral from hospital physicians. DHBs B and K did not respond.

Staffing levels

DHB G reported they had 1.0 FTE clinical nurse specialist (cardiac) supporting case management. As for medium DHBs, DHB B reported staffing support comes from 0.8 nursing FTE dedicated to this service. DHB L reported cardiac liaison nurse supported this service. In terms of large DHBs, DHB I reported they had 1.2 FTEs of staffing levels supporting case management service, whereas DHB A had 0.2 FTE CHF nurse supporting this service. DHB K did not respond.

Service elements

Only four DHBs commented on this. The following are their responses:

- *Individualised care plans and follow-up as per our care pathway for 6 months post event. (G)*
- *Education of CVD, medication and support for follow-up for newly diagnosed. Some coordination. (L)*
- *Primary/ Secondary/CCM. (I)*
- *Outpatient clinic-based, home visits, outpatients visits, pool of patients. (A)*

Funding for case management

Of those six DHBs that operated case management for CVD, five (83%) gave details of service funding – all five (small: G; medium: B, L; large: I, A) received recurrent (guaranteed) support. Three DHBs (50%; G, B, L) received case management funding as part of overall funding for their department. Two large DHBs (33%; A, I) received specific funding for their case management service. DHB K did not respond.

Annual funding for case management for CVD

None of the six DHBs knew their current total annual funding for CVD case management.

Audit process or quality improvement programme for case management for CVD

Three of six DHBs (50%; B, I, A) had audit process or quality improvement programme for their case management for CVD. The following were the indicators used:

- *Hospital Anxiety and scale, questionnaire at home visit and three months post first visit (B)*
- *Readmission rates; DNA's; New Patient numbers (I)*
- *Attendance by age/ ethnicity (However, this DHB were unable to provide demographic information for the patients who accessed this service) (A)*

I. Cultural specific programmes

Only one DHB (H) offered cultural specific programmes. The remainder replied that they did not.

Nine of 13 DHBs (69%; small: C; medium: B, H, F, L; large: I, A, N, E) had cultural support workers to facilitate access and management. Six DHBs (C, L, N, H, I, G) commented further:

- *1 FTE Disease State Management Nurse (shared with COPD), Whanau Ora staff, Korua and Kuia community support. GP Maori Outreach support GP Marae clinics, Specialist Respiratory Nurse Marae and Community House (for Pacific Peoples) clinics (FTE components are not separated out) (C)*
- *Maori Health Workers, part of the role is to encourage whanau in the decision making related to treatments and network with Maori community and Maori community health providers (L)*
- *Kai Tiaki workers provided by the DHB to support Maori patients and whanau. We refer to DSM nurse in primary health organisations for community support for Maori patients if they wish us to. Also we are establishing links/ giving talks/ holding seminars with these community groups (N)*
- *Any cultural specific programme: Not delivered by this DHB provider arm. However, in 2007/2008 this DHB funded: (1) Maori Cardiac Rehabilitation service- managed by two PHOS and delivered by three Maori Health providers. (2) a social marketing programme targeting Maori men. (3) Maori Chronic care advanced nursing practitioners. Cultural Support Workers: provides Maori health liaison and cultural support workers for patients and staff. (H)*
- *As with other questionnaires. We have Maori and Pacific cultural support unit who are available to assist with clients but this is not disease specific. (I)*
- *We liaise with Maori providers and PHOs to support Maori with CVD. Did not have the numbers to warrant a cultural specific service. (G)*

J. Equivalent initiatives that do not entirely fit the descriptions of the above services

The DHBs were asked if they operate any equivalent initiatives that do not entirely fit the descriptions the questionnaire used. In total, eight DHBs responded, in which four reported 'No' and four DHBs (B, H, K, E) provided the following responses:

Medium DHB

- *CT/ MRI cardiac work (so less tertiary intervention required); Nurse led clinics (B)*
- *Cardiac monitoring 0.8 FTE nurse (H)*
- *Work across sector: secondary to primary; work with [a sports trust]; [NGOs]; Trusts funds transport; PHO. Education and training package for staff to upskill. (K)*

Large DHB:

- *We run a very good nurse led programme for ACS. Also there is a very active research programme looking at ACS. (E)*

K. Initiatives DHBs tried to implement but were unsuccessful

DHBs were asked if there were any initiatives they have tried to implement and failed. Four DHBs (F, K, N, P) talked about the initiatives that were unsuccessful and four DHBs reported 'No'. The following are the DHB's responses:

Medium DHB

- *A support group met once in 2006 in November, this has not been coordinated again, due to timeframe and arrangement of speakers not completed. It was a worthwhile initiative as it was well supported with a good percentage turnout. (F)*
- *Low risk chest pain pathway-bed availability/ personnel. Cardiac rehabilitation in rural area. Barriers: distance; personnel; complexity of patient; financial; appropriate training/ up-skilling of RN. Cardiac Rehab with Maori Provider; appropriate personnel; funding. Empowering ward staff to undertake stage 1 cardiac rehab. Barriers; turnover of staff; time; funding. (K)*

Large DHB

- *Cardiac Care nursing staff to initiative a complete Phase I Cardiac Rehabilitation. This initiative has had many successes related to nurse time; experience and motivation. (N)*
- *We tried to run a Tai Chi for heart failure patients but we had significant drop-out and the numbers became so poor we couldn't continue. (P)*

L. Initiatives DHBs would like to implement

Lastly, DHBs were asked about the initiatives they would like to implement. Three DHBs (Q, I, E) did not respond and ten DHBs commented on the initiatives that they would like to implement:

Small DHB

- *Given the waiting list for ETT at our hospital and the fact that other DHBs have initiated nurse lead ETT I think this would be worth pursuing in the future for our DHB. (G)*
- *Increasing links and effective pathways between primary and secondary providers. (C)*

Medium DHB

- *Resources limited by nursing FTE. Working towards looser links with primary care but difficult to achieve without additional resources. (B)*
- *Cardiac rehab not currently readily available throughout (parts of the district) are not well served. (H)*
- *Heart failure Nurse-led service. Risk assessment clinics for at risk patients; more input with physiotherapists/ exercise specialists to advise cardiac patients on exercise limitations. (F)*
- *Heart failure clinic; secondary care clinics run in primary care. (L)*
- *Working with PHOs: resource and train these staff to work with cardiac rehab nurse specialist; to coordinate rehab programme back into primary GP sector; marae based to allow for whanau involvement. Venue/ personnel to deliver rehab service: more rehab programmes to cater for different age groups needed; timely intervention. More pathways: angina; CHF. (K)*

Large DHB

- Under resourced in terms of providing basic support of “basic cardiology” (A)
 - Exercise testing
 - ECHO
 - Stress ECHO
 - Angiography
 - Angioplasty
 - Surgery
- *Psychological support person for patients who have issues outside of our expertise to manage. Setting up travelling show information sessions for patients in outlying areas who are vulnerable to attend Phase II outpatient classes in (name of city). Also evening sessions for those who have returned to work and are not able to attend during the day. (N)*
- *No cardiac support group at all in rural region. Heart Group Aotearoa is being implemented there however. (P)*

M. Summary of evidence-based CVD service provision by DHB size

The table below summarises CVD service provision according to DHB size (those DHBs not providing a response are excluded)

Table 2: Summary of CVD service provision according to DHB size

	Small DHBs (%) positive response	Medium DHBs (%) positive response	Large DHBs (%) positive response
Overall Leadership in Cardiology	0	80	100
Protocols/guidelines for ACS management	33	100	100
Echocardiography	67	100	100
Coronary Angiography	0	40	80
Percutaneous coronary intervention	0	0	80
Coronary Artery Bypass Grafting	0	0	60
Cardiac rehab (hospital or community based)	100	100	100
Ongoing (post-rehab) exercise programme	0	33	60
Ongoing (post-rehab) support	100	67	80
Cardiac rehab audit or quality improvement programme	100	50	60
Smoking cessation service	67	100	60
Smoking cessation audit or quality improvement programme	0	0	Nil response
Dietician service for cardiac patients	100	100	80
Dietician service audit or quality improvement programme	0	0	33
Cardiac patient self-management and education programme	67	80	60
Self management programme audit or quality improvement programme	0	50	0
CVD Case management	33	60	40
Case management audit or quality improvement programme	0	50	100

N. Discussion and comments

The CVD questionnaire was completed by 13 DHBs. Five of these were large, five medium, and three small.

It was reassuring that nine of 13 DHBs report that they have an individual with overall leadership in cardiology (despite only seven DHBs possessing a cardiology department). However, there was a clear difference between large/medium DHBs and others in this regard with the four respondent DHBs without designated leadership comprising all three small DHBs and one medium DHB.

Two thirds of patients admitted with **acute coronary syndrome (ACS)** appear to be managed by general physicians in general medical wards. This was largely (and unsurprisingly) dictated by DHB size. Forty percent of presentations with ACS were managed in a coronary care/high dependency unit. International trends are for an increasing proportion of patients to be cared for by specialist cardiologists, and where this happens a larger numbers of ACS patients are likely to undergo invasive investigations. Published New Zealand experience [1] confirms this and a 2006 [2] suggests this difference continues despite widely disseminated regional guidelines.

The ability to conduct **post-presentation risk stratification** non-invasively was present in all 13 DHBs in the form of treadmill testing. Waiting times for inpatient treadmill tests, however, appeared problematic in small to medium DHBs at two to seven days, whereas large DHBs (with one exception) were able to perform this within 24-72 hours. **Non-invasive assessment of left ventricular function by echocardiography** was available in all but one DHB locally. Waiting times did not appear particularly problematic *for inpatients*, with access generally within 24-72 hours.

Angiography was available locally in 46% of respondents. The remaining DHBs transfer patients to other DHBs for this service. It is disappointing that waiting time was only reported in five of the six respondents (see discussion below on demographics). Waiting times ranged from 24 hours to seven days. As such it is impossible to comment comprehensively on this. The clinical experience at Waikato, however, is that waiting times do not meet current international guidelines for performance of coronary angiography post presentation with an acute coronary syndrome. Median time to angiography following presentation at Waikato is four days with outliers as long as seven to ten days particularly from referring DHBs. More detail is given in the figure below which is used with permission of Dr. Gerard Devlin, Clinical Director of Cardiology, Waikato DHB.

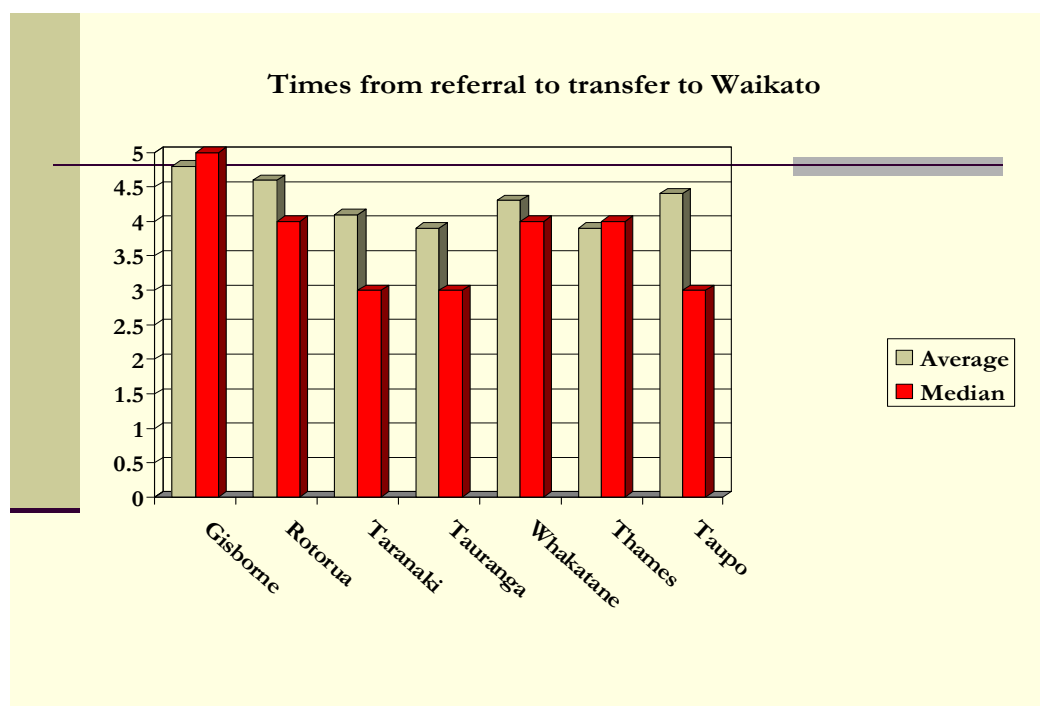


Figure 3: Waikato DHB - Patients referred for Coronary Angiography

Similar reporting patterns were noted for **percutaneous intervention and coronary artery bypass grafting** and as such it is inappropriate to comment on access to these services. However, again in Waikato DHB, waiting times for percutaneous intervention unsurprisingly reflect and parallel those for coronary angiography for inpatients. The Waikato experience is that patients proceeding to coronary artery bypass grafting post presentation with acute coronary syndrome have a median delay of eight days post coronary angiography (Dr Gerard Devlin, personal communication, December 2008).

Our major concern in relation to the section of the Stocktake dealing with acute coronary syndromes is the lack of data provided to the ABCCNZ investigators on management of high risk patients requiring coronary angiography post presentation. This is, in our experience a significant barrier to delivery of optimum care in a timely fashion to patients with a presentation of acute coronary syndrome and needs to be highlighted to funders. It has been identified in the New Zealand ACS audit as problematic [2] [3].

Provision of Elective Services for Assessment of Patients with suspected Coronary Artery Disease. As mentioned above, all 13 DHBs provide non-invasive assessment with **exercise tolerance testing**. **Waiting times varied from two weeks to four months** which we believe to be not unreasonable, though we find it surprising in light of our own experience (Waikato) of a waiting list for treadmill testing of three to four months with consequent difficulty coordinating treadmill tests with outpatient appointments, as an ideal 'one-stop shop'.

It was also interesting that five of the 13 accepted direct referrals from primary care. This approach was adopted by all three small DHBs. We understand that some medium and large DHBs are also considering this concept. If used wisely with appropriate referrals and resources we would welcome this approach. However, there are obvious concerns regarding quality of referral (which would potentially be ameliorated with greater and more widespread use of adequate decision support structures and tools). We are not aware of any published data on direct primary care access to exercise tolerance testing in cardiology. There is data for primary care direct access to echocardiography – with mixed results (see below).

Variable **outpatient wait times for echocardiography** were again noted across the DHBs from two weeks to twelve months. Our personal experience at Waikato is close to 12-18 months for a “routine” echocardiogram. A waiting time of six months or less clearly fulfils current MoH guidelines for DHB compliance, but again makes the one-stop shop approach logistically difficult. We are not aware of international published guidelines on this. Five DHBs accepted echocardiography referrals directly from primary care. A local pilot project of a similar service about to commence in Waikato identified that one referral in six had pathology requiring cardiology follow-up. The remainder were either benign flow murmurs, or could be managed in primary care with cardiology advice by letter (Dr. Gerard Devlin, personal communication, December 2008).

From the four of six limited information provided **wait times for elective coronary angiography** vary from four weeks to nine months. Similar wait times are reported by the four DHBs who responded in this section for coronary angioplasty range for one to six months. The wait times reported for elective cardiac surgery are three to twelve months from wait listing. We believe this to be unfortunate (and certainly in excess of most international experience) and would suggest that a waiting time of less than 3 months is preferable for all.

Data on **cardiac rehabilitation** was provided by all 13 DHBs. The mean duration of programmes appeared to be just over six weeks, with one DHB reporting the programme could last up to six months. Five DHBs responded that the programme was both community and hospital based. Of concern is the fact that just less than half of the DHBs appeared to have some form of audit process to assess the effectiveness of the cardiac rehabilitation service. There was no mention of any key performance indicators used. Even when employed, audits appeared to largely consist of demographic data collection and patient satisfaction surveys. Once again, we believe this to be extremely poor and feel that it calls into question the validity of the quality reporting data that DHBs provide to the Ministry of Health (and hence to the public).

Of the 13 respondents, three DHBs (23%) reported that they did not offer a **smoking cessation** service. Given the importance of smoking cessation in secondary prevention, failure to offer the service in even 23% of DHBs is a cause for concern. Furthermore (and once again), only two DHBs appeared to audit the effectiveness of a smoking cessation program, and similar conclusions to those expressed above must apply.

Dietician Services – We were similarly surprised to find that one of the 13 respondents did not offer any dietician support for cardiac patients. Again, no audit processes around the effectiveness of dietetic intervention appeared present in all but one DHB.

Cardiac Patient Self Management and Education Programmes – There must be similar concern that these programs, essential to effective CCM, were not offered in four of 13 DHBs responding to the questionnaire. Staffing levels for programmes that were in operation were limited. Inpatient education was given by ward staff without assessment of effectiveness of patient self management programmes - an audit being reported in only one DHB.

Disappointingly, only six (of 13) DHBs operated **case management programmes** for CVD, and again, with limited staffing levels. Physicians and primary care had access in three DHBs. Assessment of the effectiveness by an audit programme was present in only 3 DHBs

Cultural specific programmes were only offered by one DHB. However, 70% offered cultural support workers to facilitate access and management.

Variability in provision by DHB size was not confined to local availability of ‘technical’ tertiary service such as PCI and CABG. Larger DHBs were generally more likely to have CVD leadership, protocols for ACS management, CVD case management and audit processes for smoking cessation services, dietician services and case management services. Though the converse was the case for

audit processes for cardiac rehabilitation services (with no large DHBs reporting audit processes in this area) such discrepancies in provision and monitoring are of considerable concern.

The paucity in provision of **demographic information** on patients accessing the majority of services was once again demonstrated. Simple demographics were only available in relation to exercise tolerance testing in 54% of DHBs responding, in relation to echocardiography in 50%, for coronary angiography in 46%, for PCI in 75%, for CABG in 66%, for cardiac rehabilitation in 46%, for smoking cessation services in 20%, for dietetics services in none, for self management and education programmes in 33%, and for case management in 17. Easy access to such information is essential for adequate service planning, and the lack of such data reinforces the concerns around information transfer and decision support which emerged in our Generic Stocktake Report (May 2009).

In conclusion, we believe the present findings to be disappointing. As mentioned previously, a major concern is the lack of data relating to the management of acute coronary syndromes, particularly further access to invasive risk stratification which is critical to current best practice and emphasised in Australasian and other international guidelines [4] [5] [6] (and as further detailed in our Literature Review). Cardiac rehabilitation and ancillary programmes appeared to be offered by all DHBs, but a recurrent theme was the lack of assessment of effectiveness by audit of agreed key performance indicators. We are also concerned about the variability (apparently by DHB size) in provision, in guidelines and in audit of CCM services which should be in place in all DHBs, irrespective of their size.

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Chapter 4: CHF Analysis

The CHF questionnaire was completed by 14 DHBs⁹. The DHB's were clustered by size for ease of analysis¹⁰. There were three small (DHB: C, G, Q), five medium (DHB: B, L, K, H, F) and six large DHBs (E, I, A, M, N, P). This breakdown is in accordance with the MoH breakdown by population. The following section describes the analysis of these questionnaires. The analysis considers an overview of people with CHF, patient demographics and services provided.

DHB size	DHB code
Small	C, G, Q
Medium	B, L, K, H, F
Large	E, I, A, M, N, P
Total	14

There was a mean of 372 patients with CHF admitted as inpatients to 13 of 14 DHBs in 2006, with on average 129 (range 35 to 247), 193 (range 100 to 290) and 613 (range 199 to 923) patients with CHF admitted as inpatients to the small DHBs, medium DHBs and large DHBs respectively. However, one medium DHB (K) did not provide this data.

A: Demographic information

Thirteen of 14 DHBs provided demographic information of their patients admitted for CHF in 2006 (DHB K did not provide this data). There were more male (52%, range 46% to 57%) than female (48%, range 43% to 54%) patients admitted. Most patients admitted were NZ European (75%, range 48% to 96%), followed by Maori (12%, range 3% to 36%), 'other ethnicity' (8%, 0% to 18%), Pacific (4.8%, range 0% to 24%) and Asian (1.4%, range 0% to 5%). The mean age of these patients was 77 years for both NZ European (range 72 to 79) and 'other ethnicity' (range 65 to 97), 64 years for Maori (range 58 to 77), 59 years for Pacific (range 32 to 68) and 73 years for Asian patients (64 to 82). One large DHB (M) reported that they were unable to provide patients' age details as these were not available by ethnicity.

Admission

The majority of patients with CHF (70%) were admitted by general physicians, 20% of the patients were admitted by a cardiologist, 4.2% by Older Peoples Health, and 5% of patients were admitted by other departments such as the medical, paediatric, and surgical department. Two medium DHBs (L, K) did not provide details. Most patients were initially managed on a general medical ward (72%; range 0.5% to 100%), 15% (range 0% to 66%) on cardiology wards, 5% (0% to 31%) on geriatrics wards and less than 1% (range 0% to 3%) on other wards. Three DHBs (G, K and M) did not provide this data.

⁹ DHBs that are included in this analysis are: Small: C, G, Q, Large: B, L, K, H, F, Large: E, A, I, N, M and P

¹⁰ DHBs were categorised into small, medium and large DHB by provider arm revenue. The MoH used the same classification for the 'DHB hospital Benchmark information report (March 2008)'.

Audit process

Six DHBs (46%; B, L, H, I, A, N) reported they had audit processes or quality improvement programmes for the management of patients admitted with an acute exacerbation of CHF and six (46%) indicated the opposite. One large DHB (P) and one small (Q) did not respond.

One medium DHB (K) that did not have audit process cited that they had recently at that time (2006) registered for HF registry and the National benchmarking audit was ready to go and was beginning to use those tools.

Five of six DHBs that had audit processes or quality improvement programme reported the clinical indicators that they were using. The following are their response:

- *HF registry nationwide initiative (B)*
- *Intermittent review on inpatients (L)*
- *Readmissions (L)*
- *JCAHO clinical indicators (I)*
- *'A full audit was completed in 2006' (I)*
- *Attendance rate by age and ethnicity (A)*
- *Key drugs, length of stay, social profile, echo measures. (N)*
- *Sampling audit similar to "Grace" (N)*

B: Staffing

Overall leadership

Only four DHBs (29%; B, L, I, M) had an individual with overall leadership in CHF and ten (71%) indicated the opposite.

Cardiology Department

Eight of 14 respondent DHBs (57%; B, K, E, I, A, M, N, P) had a cardiology department and five DHBs (36%) did not. One large DHB (L) did not respond.

Staffing level

The eight DHBs were asked to provide the staffing levels (FTE) in their cardiology department. Seven DHBs (B, K, E, I, A, N, P) responded. In terms of the medium DHBs: DHB B reported 2.4 FTEs of cardiologists; 4.6 FTEs of general physicians; 21.3 FTEs of nursing; 0.3 FTE of physiotherapist; 0.2 FTE of occupational therapist; 4.5 FTEs of cardiac technicians/scientists and 0.1 FTE of dieticians. In total, DHB B indicated a staffing level of 33 FTEs within its cardiology department. DHB K indicated 1.5 FTEs of cardiologists; 19 FTEs of nursing (DHB-wide); and 1.8 FTEs of cardiac technicians/scientists, for a total of 22 FTEs within its cardiology department.

For large DHBs: DHB E reported 8.5 FTEs of cardiologists; 99.7 FTEs of nursing (17.5 in service and 82.2 in wards), 21.6 FTE of cardiac technicians/scientists; 16.5 Administration and 16.7 others (i.e. radiographers, registrars and house officers). This DHB B had 163 FTEs of staffing within its cardiology department. DHB I reported 8.3 FTEs of cardiologists; 42.8 FTEs of nursing; 15.5 FTEs of cardiac technicians/scientists; 0.2 FTEs of health psychologist; 0.8 FTEs of heart failure RN and 0.6 FTEs of health failure nurse specialist. This DHB also reported that their nursing staff were part of nursing FTEs listed for the cardiology department. In total, DHB I had a staffing level of 68.2 FTEs within its cardiology department. DHB A reported 9 FTEs of cardiologists; 1 FTEs of general physicians; 3 FTEs of nurse and 12.7 FTEs of cardiac technicians/scientists. In total, DHB A indicated a staffing level of

25.7 FTEs within its cardiology department. DHB N reported 12FTEs of cardiologists; 65.8 FTEs of nursing; 0.5 FTE of physiotherapist; 0.5 FTE of occupational therapist; 11.7 FTEs of cardiac technicians/scientists and 0.5 FTE of dieticians. In total, DHB N indicated a staffing level of 91.0 FTEs. Lastly, DHB P reported 4.4 FTEs of cardiologists; 5.7 FTEs of nursing; and 10.5 FTEs of cardiac technicians/scientists, for a total of 20.6 FTEs in the cardiology department.

Guidelines

Seven DHBs (50%; C, B, L, F, A, N, P) reported that they had protocols or endorsed guidelines for their management of CHF. Six (43%; G, H, K, E, I, M) reported the opposite. One small DHB (Q) did not respond to this question.

Three DHBs that reported having protocols or endorsed guidelines for the management of CHF made additional comment:

- *Standing orders and Action Plan (C)*
- *In line with the NZGG Guidelines. (F)*
- *Different cardiologists use different guidelines. (A)*

Two DHBs that reported not having protocols or endorsed guidelines for the management of CHF provide additional comments:

- *We are guided by the NZGG on the management of heart failure. (G)*
- *Guided by Heart Foundation publications on the management of heart failure. (G, K)*

C: Echocardiography for Patients with CHF

Thirteen of 14 DHBs (93%) indicated that they offer echocardiography for CHF management. Only one small DHB (Q) reported that they did not, although this DHB provided some information on echocardiography done for all diagnoses.

Demographic information

Four DHBs (L, E, I, A) gave details for patients who accessed echocardiography for CHF in 2006, although one DHB (L) was only able to provide gender data. Nine of 13 DHBs (69%; C, G, B, K, L, H, P, N, M) did not provide demographic data.

From the data of four DHBs, more men (53%) than women (47%) accessed echocardiography for CHF. The ethnicity and mean age data of the three DHBs was aggregated: the majority of the patients who had an echocardiography were NZ Europeans (61%), followed by patients from 'other ethnicity' (12%). 8% were Maori, 9% were Pacific and 4% were Asian. The mean age of these patients were 62 years for NZ European, 60 years for patients of other ethnicity, 50 years for Pacific and Maori, and 48 years for Asian.

Staffing level

The DHBs were asked to indicate the staffing levels (FTE) for the echocardiography service. Ten DHBs (G, B, K, H, F, E, A, M, N, P) provided the staffing levels in their cardiology department. Four DHBs did not respond. In terms of small DHBs; DHB C and Q did not respond. DHB G reported 3 FTEs of physicians (cardiology) and 1 FTEs of nursing, in total DHB G indicated a staffing level of 4 FTEs in echocardiography service.

For medium DHBs, DHB B reported 4.5 FTEs of echocardiography technicians and 1 FTE of nursing; a total of 5.5 FTEs. DHB L did not respond. DHB K reported they had 1.8 FTEs of echocardiography

DHBs classified by size: Small: C, G, Q, Medium: B, D, L, K, H, F, Large: E, A, I, M, N and P

sonographers. DHB H indicated that they had 3.1 FTEs total staffing level in this service, which comprised of 2.5 FTEs of echocardiography technicians and 0.6 FTEs of 'other staffing' (booking clerk). DHB F reported 1.5 FTEs of echocardiography technicians.

For large DHBs, DHB E had 15.1 FTEs total staffing within their echocardiography service, which included 8.5 FTEs of physicians (cardiology), 4.6 FTEs of echocardiography technicians, 1 FTE of nurse aid and 1 FTE of administrator. DHB A reported 3 FTEs of echocardiography technicians and 0.1 of nursing. DHB N indicated that they had 2.4 FTEs of echocardiography technicians, 1.8 FTEs of receptionists/booking clerk and 0.5 FTE of orderly; in total, this DHB had 4.7 FTEs staffing levels in echocardiography service. DHB M reported they had 10.1 total FTEs in the service, comprising 1.4 physicians (cardiology), 8.2 FTEs of echocardiography technicians and 0.5 FTE of nursing. Lastly, DHB P reported having 4.4 FTEs physicians (cardiology) and 2.4 FTEs echocardiography technicians for a total of 6.8 FTEs in the service. DHB I did not respond, citing that 'no specific FTE for ECHO part of general cardiology budget.'

Number of Echoes performed

Seven DHBs (C, G, B, L, H, K, A) did not provide data on the number of echoes performed for CHF in 2006. One of these DHBs (H) said that they could not identify echoes performed by patient diagnosis). A small DHB (Q) reported performing 275 echoes, although it specified that this number was for all diagnoses instead of being CHF-specific. One medium DHB (F) reported that 1,565 echoes for CHF were performed in 2007. Five large DHBs reported they had on average performed 6,228 echoes for CHF in 2006 (actual numbers were 10649 (E), 4600(N), 3976 (I), 4356 (P), and 7560 (M)). However, DHB I stated its number of echoes performed was for all cardiology, since specific numbers of CHF patients were unavailable.

Waiting time for Echocardiography

For small DHBs, DHB C did not provide the waiting time for inpatients, however the waiting time for outpatients was 6 to 8 weeks. For DHB G the waiting time for inpatients was 'nil' and outpatients was 2 to 4 weeks. DHB Q, which reported not offering echocardiography specifically to CHF, nonetheless recorded an outpatient waiting time of 93 days, although it did not supply an inpatient waiting time. Waiting time for an echocardiography for inpatients at respondent medium DHBs was generally less than 24 hours. However, the waiting time for outpatients was approximately 8 weeks, though one DHB (L) reported 10 days. Across the large DHBs, it appears that the average waiting time for inpatients was approximately 2 to 3 days, although one DHB (I) stated that this was 'priority determined.' The outpatient waiting time for large DHBs varied more widely. Two DHBs (M and N) were priority determined. DHB N reported a waiting time of within 6 weeks if urgent and 6 to 9 months for semi-urgent outpatients. DHB M cited: Priority A: 1-2 weeks; B: 9 weeks; C: 6 months. DHB I reported less than 6 months and DHB A reported 90 days. Lastly, DHB E reported a waiting time of less than one week for outpatients.

Funding for Echocardiography

The echocardiography services in most DHBs (85%; G, B, L, H, F, E, I, A, N, P and M) were supported by recurrent and guaranteed funding. Two DHBs (C, K) did not respond. Nine DHBs (69%; G, B, L, H, F, E, I, P and M) received overall funding for their cardiology department or general medical service, with only one DHB (A) receiving ring-fenced funding for echocardiography. DHB N mentioned that it was not funded per echo, but rather as part of primary referred funding, which was approximately one fourth the cost of actual service.

Actual funding

Of the 13 DHBs that offered Echocardiography service only one DHB provided details on actual funding. DHB (I) a large DHB stated that their current amount of annual overall funding they received for their echocardiography service was \$ 9.6m.

Audit process or quality improvement programme for Echocardiography Service

Five DHBs (39%; B, F, E, I, N) reported that they had an audit process or quality improvement programme for their Echocardiography service, while another five DHBs (39%; L, H, A, M, P) indicated the opposite. Three DHBs (23%; C, L, G) did not respond.

Clinical indicators

The five DHBs were asked what clinical indicators they were using for this service. One medium size DHB (F) reported that they used HAPNZ (Health Accreditation Programme for New Zealand) and other DHB (B) reported "QI in response to issues identified with service". In terms of large DHBs, one DHB (N) reported using:

- Waiting times
- Patient category type
- Number of echoes performed
- DNA's
- Numbers reported by cardiologists

DHBs E and I did not provide data on clinical indicators.

D. Hospital at Home Teams for Management of Acute Exacerbation of CHF

Three of 14 DHBs (21%; B, C, F) offered hospital at home team (early discharge support and/or admission avoidance) for CHF exacerbation. Eleven (79%) reported they offered no such service.

Comments

Four DHBs that did not have hospital at home teams commented further. A small DHB (G) explained that they did not have formal hospital at home team, however they had cardiac nurse specialists who provide home visits and follow-up after discharge. Another medium DHB (K) said that they were unable to implement this service due to resource constraints. A large DHB (A) stated that some patients in CHF (very few) are visited at home by CHF nurses. This DHB went on to say that this service is limited due to lack of resources as well as an uncertainty of the value of this service. DHB N mentioned that a Home Hospital Service was available but does not offer services as stated in questionnaire.

Among DHBs that did indicate offering a hospital at home team, one commented further. DHB F reported their service involved following a group of patients with end-stage heart failure, which allowed them to titrate medications (coordinated through GPs).

Demographic information

Among the three DHBs that indicated offering a hospital at home team, none provided demographic data of patients.

Staffing levels for this service

The two medium size DHBs responded to this question, one (B) reported they had 1FTE nursing. The other medium size DHB (F) reported they were unable to determine staffing levels because service delivery intermixed with Phase two of cardiac rehabilitation.

Funding for hospital at home teams

One medium DHB (F) reported their service received specific funding on a recurrent and guaranteed basis and the total annual funding this service received was \$127,000. The other medium DHB (F), indicated that their service received a combination of recurrent (guaranteed) and limited time project funding support, however, they were unable to determine the amount of annual funding for this service. The small DHB (C) did not respond.

Audit process or quality improvement programme for hospital at home teams

Only one (F) of the three DHBs had an audit process or quality improvement programme for their hospital at home service. This DHB (medium) reported using the New Zealand Guidelines Group-Cardiac rehab as a clinical indicator. DHB B indicated that it did not have such processes, and DHB C did not respond.

E. Discharge Planning for Patients admitted with acute exacerbation of CHF

Eight of the 14 DHBs (57%; C, B, L, E, I, A, N, M) had specific discharge planning for CHF patients. Six DHBs (43%; Q, G, K, H, F, P) reported they did not have specific discharge planning. However, one of these DHBs (F) replied on questions regarding the funding of this service.

Funding for Discharge Planning

In total, six of eight DHBs (L, F, E, I, A, N) received recurrent and guaranteed support for this service, one (M) received a combination of recurrent funding and limited time project support and two (B and C) did not respond. The discharge planning service of five DHBs (L, F, E, I, N) was funded as part of overall funding for cardiology or general medical services, the other two (A, M) receiving specific ('ring-fenced') funding.

Total annual funding

Most DHBs were unable to provide details of the funding they received for this service; 'unknown' (L); 'not available' (A, F); and nil response (E, M). One DHB (N) explained that funding was for heart failure nurse salary plus direct costs (only budgeted) and a large DHB (I) had received a recurrent and overall funding of NZD 9.6 million.

Audit process or quality improvement programme for discharge planning

Only one of 8 DHBs (13%; N) reported they had an audit process or quality improvement programme for this service. This DHB reported their database captured readmission rate (less than 3 months), demographics and medications and they used these measures as clinical indicators.

Comments

Five DHBs commented on this service. Among DHBs that provided discharge planning for patients admitted with acute exacerbation of CHF, a small DHB (C) reported that they made referral to community outreach and discharge summary includes instructions; follow up appointment and GP

consultant. A medium DHB (L) indicated that their discharge planning service provides support for patients through nursing services only. A large DHB (A) stated that it selected 'frequent flying' patients seen by CHF nurses and made outpatient management plans for them. Another large DHB (N) mentioned providing a heart failure pack, plan for scales, information on how to monitor self, and information on low salt diets for all patients.

For those DHBs that did not have discharge planning for patients, one small DHB (G) said that they were trying to establish this service; however, describing the process as challenging since the three involved physicians had different views on treatment options. A medium DHB (K) explained that no referrals were sent to cardiac care coordinator as too many referrals meant workload could become unmanageable for one staff member. Lastly, another medium DHB (H) indicated that they operated discharge planning for high-risk patients only.

F. Outpatient Based Management for Patients with Heart Failure

Twelve of 14 DHBs (86%) offered outpatient based CHF management services. Two small DHBs (C, Q) did not. Nine DHBs (64%; small: C, G; medium: B, K, H, F; large: A, N, and M) offered a Home Team for CHF management, and three DHBs (large: E, P, I) did not. Two DHBs (Q, L) did not respond.

Demographic information

The 13 DHBs were asked to provide demographics of patients accessing these services in 2006. Demographic information was provided by three DHBs (38%; H, E, A), one of which (E) did not offer home team for CHF management. More males (64%) than females (36%) accessed the service. Sixty-four percent of patients were NZ European, 16% were Maori, 15% were from 'other ethnicity', 2.3% were Pacific and 2.7% were Asian. The mean age of patients when was 77 years for 'other ethnicity', 67 years for NZ European, 59 years for Maori, 55 years for Pacific and 56 years for Asian patients.

Staffing levels

Outpatient-based management service comprised one FTE cardiac nurse specialist role in DHB G. DHB B reported that they had one FTE staff dedicated to the service. DHB H had 3.1 FTEs nurses to manage outpatients with CHF, COPD and DVT. DHB F reported this service was included in 1 FTE 'for everything.'

For large DHBs: DHB (E) had 0.6 FTEs Nurses; 0.6 FTEs RMO and 0.6 FTEs SMO. DHB I reported that staffing was part of the cardiology budget. DHB A reported 0.2 FTE staffing for their service. In DHB N, there was a direct 1 FTE staffing and indirect staffing of cardiologist and registrars. DHB M reported a staffing level of 3 FTEs heart failure nurse specialists. Last of all, DHB P stated that there was 0.1 FTE for nurse led clinic, although there were no dedicated medical staff.

Funding for Home team management for patients with Heart Failure

Nine DHBs (75%; G, B, H, F, E, I, A, M, P) responded that they had received (guaranteed) support for their service and three (25%; K, L and N) did not respond. The outpatient based management of six DHBs (50%; G, H, F, E, I, P) was funded as part of overall funding for the cardiology or general medical service and for three DHBs (25%; A, B, M) the service was 'ring-fenced'. Three DHBs (K, L, and N) did not respond.

Total annual funding

DHBs were mostly unable to provide the amount of funding they received for this service (G, L, K, H, F, E, A, P, N, M). One medium DHB (B) reported they had received ring-fenced funding of \$127,000. A large DHB (I) received recurrent and overall funding of NZD 9.6million.

Audit process or quality improvement programme for outpatients management for CHF patients

Only two DHBs (17%; large: I, M) had an audit process or quality improvement programme for this service and seven DHBs (58%; small: G; medium: H, F; large: E, A, P and N) reported the opposite and three (B, L, K) not responding. Clinical indicators used by DHBs I and M comprised 'medication use' (M) and 'patients with left ventricular systolic dysfunction on ACE'; 'patients with left ventricular systolic dysfunction on target dose ACE' and 'patients with left ventricular systolic dysfunction on beta blockers' (I).

Self Management and Education

Nine DHBs (64%, small: G; medium: B, K, H; large: E, I, A, N and M) offered specific programmes in self-management and education and four (28%, C, L, F, P) did not, although one of these DHBs (F) answered subsequent questions regarding this service. DHB Q did not respond.

Seven of the nine DHBs (78%; G, B, E, I, A, N, M) reported their programme involved written action plans.

Demographic information

One of nine DHBs (11%, E) provided full demographic information of patients accessing self-management and education services in 2006. Another DHB (M) provided only ethnicity details. Seven DHBs (G, B, K, H, N, I, A) did not provide demographic data.

More male patients (69%) than female patients (31%) accessed this service. More NZ European patients (40%) accessed the service, followed by Maori patients (29%), Pacific patients (17%), 'other ethnicity' (11%) and Asian patients (4.5%). The mean ages were 66 years for those of 'other ethnicity,' 60 years for Maori patients, 59 for Pacific patients, and 58 years for NZ European patients. No Asian age data was reported.

Staffing levels

Staffing levels varied between DHBs; two medium DHB (B and F) reported that there was 1 dedicated FTE (with DHB F stating this also covered all cardiac rehabilitation). In terms of the five large DHBs: DHB E reported they had 1.8 FTE of nurses and 0.5 FTE of RMO; DHB I did not provide specific detail; DHB A had 0.2 FTE of nursing.; DHB N reported 1 FTE of staffing and DHB M had 3 FTE heart failure nurse specialists.

Referral process

The self-management and education programmes of four DHBs (G, B, F, E) were open to referral from both hospital physicians and primary care. The service of two large DHBs (I and A) was open to hospital physicians only, one large DHB (M) stated referral only came from primary care, and one large DHB (N) reported that their self-management and education programmes was open to referral from primary care and cardiologist only. Two medium DHBs (K and H) did not respond.

Funding for self-management and education

Six DHBs (G, B, F, E, A, I, M) received recurrent (guaranteed) support and three DHBs (H, K and N) did not respond. The self-management and education programmes of five DHBs (G, F, E, I, M) were funded as part of an overall funding for your cardiology or general medical service, and two (B, A) reported they received ring-fenced funding. Three DHBs did not respond.

Actual annual funding

Most DHBs were unable to detail the amount of funding they received for this service. A medium DHB (B) reported that they received specific funding of \$127,000.

Audit process for self-management and education

Only one large DHB (E) indicated they had an audit process or quality improvement programme for this service. This DHB was unable to detail the clinical indicators used. Six respondent DHBs (small: G; medium: H, K; large: I, A, M) reported that they had no such processes or programmes, and two (B, N) did not respond.

Comment

One DHB (N) further stated that a pack was given to all patients in the cardiology service; the pack contained a DVD on self-management and one on 'living with chronic health problems' specifically tailored for Maori patients, a poster to put on the fridge, advice about key monitoring and when to act. Another DHB (G) stated that self-management was individualised and provided by CNS-cardiac, and that patients are also invited to attend their cardiac rehabilitation program. The DHB (K) that consistently did not respond to any of the follow-up questions commented that: their self-management and education involved a one on one education, the use of the HF-CHF management book, weight and diet management, and diuretic titration.

Case Management

Eight of 14 DHBs (57%, small: G; medium: B, K, H, F; large: I, N, M) provided case management for patients with CHF, five DHBs (small: C; medium: L; large: E, A, P) did not have such service and one DHB (Q) did not respond. One DHB (C) that did not operate case management said that they were developing care plans for patients.

Among DHBs that did offer case management, DHB B that offered case management reported that the service was limited to multi-comorbid frequent flyers. DHB G stated that case management was provided by a Cardiac Nurse Specialist following admission to hospital and that this service received occasional community referrals from GPs/Practise Nurses. DHB H mentioned that their case management was a function of the Medical Outreach Service. DHB I stated that access to their service is on a case by case, high needs basis as no specific funding is ring fenced for this service.

Demographic information

Comprehensive demographic information of patients who were managed on case management was provided by only one DHB (H), although DHB M was able to provide patient ethnicity data. Six DHBs (G, B, K, F, I, N) did not provide demographic data.

From the limited data available, more female patients (52%) than male patients (48%) accessed this service. In general, more NZ European patients (43%) accessed the service, followed by Maori patients (22%), 'other ethnicity' 17%, Pacific patients (15%) and Asian patients (4.5%). Mean ages

were 87 years for patients of 'other ethnicity', 68 years for NZ European patients, 67 years for Pacific patients and 62 years for Maori. Details on Asian ages were not provided.

Referral process

The case management service of three DHBs (G, H, F) were open to referral from both hospital physicians and primary care. One large DHBs' (I) service was open to hospital physicians only, another large DHB's (M) service was open to primary care only, and one large DHB (N) reported that their case management service was open to referral from cardiologist only. Two medium DHBs (B and K) did not respond.

Staffing levels

A small DHB (G) reported that there was 1 FTE of cardiac specialist nurse role. For the medium DHBs (H and F), DHB H reported that staffing level for case management was as per the outpatient based management team (i.e. the same service), i.e. 3.1 FTEs nurses to manage outpatients with CHF, COPD and DVT. DHB F had 1 FTE which included all cardiac rehabilitation activity. A large DHB (I) reported staffing was part of the cardiology department budget. DHB N reported 1 FTE of staffing and DHB M had 3 FTE of heart failure nurse specialists. DHBs B and K did not provide staffing details.

Service element and their integration

Eight DHBs were asked to define the elements of their case management service and integration. Three (K, F, M) did not respond. Comments from five (G, B, H, I, N) DHBs' indicated that they perceived case management as about supporting and facilitating patients in self-management of their condition.

"...they move from the acute management and stabilisation back to the community self/GP management" (DHB B)

"A focus is on supporting the client to be independent and teaching the client to monitor and manage their condition." (DHB H)

"The aim is self management independence or dignified death." (DHB N)

Moreover, some DHBs explained that integrations were occurring in order to facilitate case management services. Nurses and case management providers had linkages with GPs, PHOs, other allied health care team and medical services.

"...close liaison with GPs and PHOs." (DHB I)

"...linking with in hospital allied health team or palliative team, rest home, transplant team, Maori health provider if required to the community setting, e.g. GP, rest homes, hospice." (DHB N)

"The nurses ... have close access to physicians. They also have access to dieticians, take bloods, refer patients for blood tests, x-rays (done the same day), get scripts from physicians. They work closely with the other providers involved in the care of the client, including groups, care plus nurses... maintain links and support other nursing teams e.g. hospice nurses." (DHB H)

In terms of the service elements of case management, the following were the responses from the DHBs.

Small DHB

- *Individualised assessment and care plans. Access to cardiac rehabilitation programme. Medication titration action plans monitored. (DHB G)*

Medium DHB

- *Acute in hospital support, outpatient nurse led clinics, home based/community stabilisation. Most patients received all three services as they moved from the acute management and stabilisation back to the community self/GP management. (DHB B)*
- *The medical outreach service received referrals for people who had been identified as having two or more admissions in one year (or at risk of doing so). The nurses visited clients in their homes. (DHB H)*

Large DHB

- *Phone calls; ordering tests; clinic visits; in hospital visits and home visits. (DHB I)*
- *From ward to home, including frequent flyers, brittle, complex patient, non-compliant patient, end stage - palliative. Complex discharge planning, patient and family education, following up by phone calls and home visit as required. (DHB N)*

Funding for case management

Of those eight DHBs that operated case management, six (G, B, H, I, M) reported they received recurrent and guaranteed support for their service. DHB F indicated that it received a combination of recurrent and limited time project support for this service and two DHBs (K, N) did not respond. The case management services of six DHBs (G, H, F, I, M) were funded as part of an overall funding for their cardiology or general medical service, although three DHBs (B, K, N) did not respond. DHB I indicated receiving \$9.6 million as part of their overall department funding.

Audit process for case-management

Only two DHBs (25%, large: N and I) reported they had an audit process or quality improvement programme for their case management services. One DHB (N) reported using readmission (less than 3 months) as a clinical indicator. Thus, it seems that only one DHB (N) conducts regular audit in this area. The other DHB (I) did not provide details on its audit process or quality improvement programme.

Home Telemonitoring

Only three DHBs (medium: L, F and large; N) indicated they offered this service. The remainder (79%) did not.

Demographic Information

None of the DHBs provided demographics of patients accessing this service in 2006.

Referral process

One medium DHB (F) indicated referral are accepted from both hospital physicians and primary care. The service of a large DHB (N) is open to cardiologists' referral only. DHB L did not provide information on their referral process.

Staffing level

A medium DHB (F) reported 1.0 FTE cardiac rehabilitation overall for outpatient-based management. A large DHB (N) reported they have 1.0 FTE staff supporting this service. DHB L did not provide information on staffing levels.

Funding for telemonitoring for CHF patients

A medium DHB (F) received recurrent guaranteed funding for their telemonitoring service and this service was funded as part of an overall funding for their cardiology / general medicine department. Two DHBs (L and N) did not respond.

Audit process and quality improvement for telemonitoring

One DHB (N) stated that they did not have an audit process or quality improvement programme in place for telemonitoring. DHBs F and L did not respond.

G. Palliative Care Support for CHF Sufferers

Eleven DHBs (79%; small: G; medium: B, L, K, H, F; large: E, P, I, N, M) did offer palliative care support for patients with end-stage CHF. Two DHBs (C, A) reported that they do not. DHB Q did not respond.

Comments

Six DHBs made further comments regarding this service. The six DHBs that offered palliative care support for CHF patients discussed the nature of the support; three medium-size DHBs reported the following:

“Community based service” (B)

“Through the hospice” (H)

“Hospital palliative care team and hospice palliative care service for patients in community, however, gaps existed for Maori and Pacific patients.” (K)

Some large DHBs had more comprehensive palliative care support:

“An End of Life Support Care package is available for any patient at the end of life stage. This support package is available for use to General Practice, Hospital level residential facilities, and District Nursing. Each of these groups are supported by the Palliative Care team and trained to deliver basic palliative care. The Palliative Care team provides support to those teams in general, but also for specific patients with complex needs. There is also a same support provided in the Hospitals.” (E)

“[Person completing the questionnaire] worked with palliative care team and hospice nurse mainly co-joint management, we do not discharge our patients from the service.” (N)

“Palliative care service established late 2007 and to date has not managed CHF patients.” (P)

Demographic information

No DHBs provided demographic data.

Service provision

Six of 11 DHBs (55%; G, B, K, H, F, N) did not respond. Five DHBs responded, of which the palliative care support in four DHBs (I, M, P) were provided by palliative care specialists. The palliative care support of one large DHB (E) was provided by both CHF and palliative care specialists and one medium DHB (L) reported that their service was supported by neither CHF specialists nor palliative care specialists (they did not say who did support it).

Referral process

Three DHBs (L, E, and M) indicated that their palliative care service was open to referral from both hospital physicians and primary care. Two other DHBs (I, P) reported that they accepted referral from hospital physicians only. Six DHBs (G, B, K, H, F, and N) did not respond.

Funding for palliative care support for CHF patients

Five of 11 DHBs (L, E, I, P, M) reported they received recurrent and guaranteed funding for their palliative care support service. Six (G, B, K, H, E, N) did not respond.

Two DHBs (L, P) indicated that their service is funded as part of an overall funding for their cardiology or general medicine department. One DHB (M) indicated that their funding for this service is part of the palliative care budget. Two (E, I) indicated that they received ring fenced funding for their palliative care support. Of these two DHBs, one large DHB (E) reported they received a specific funding of \$4,241,267. Another large DHB (I) reported they were allocated \$300,000 of specific funding.

H. Cultural Specific Programmes

Twelve of 14 DHBs (86%) reported that they did not operate any cultural specific programmes and two DHBs (C, N) reported that they did operate such programmes. Ten DHBs (71%; C, B, L, K, H, E, I, A, N and M) reported they have cultural support workers. Four DHBs (29%; small: Q, G; medium; F; large: P) did not have cultural support workers available to facilitate access and management.

Comments

Six DHBs made additional comments.

Small DHBs:

A small DHB (C) that offered cultural specific programme and had cultural support workers listed their staffing levels for this service: *1FTE Disease State Management Nurse (with an unknown % of FTE role for CHF); Whanau Ora staff; Korua and Kuia community support; GP Maori Outreach support; GP Marae clinics; Specialist Respiratory Nurse Marae and Community House (Pacific Island People) clinics (FTE components not distinguished).*

Another small DHB (G) stated that cultural support workers were provided as required.

Medium DHBs:

One medium DHB (L) that had cultural support workers reported they had Maori health workers, part of whose role was to encourage whanau in the decision making process related to treatments and to network with Maori community and Maori community health providers. Another medium DHB (K) said they worked with the Hauora groups (PHO) and had one on one work with whanau.

DHB H stated that its Maori service provides Maori health liaison and cultural support for patients and staff.

I. Equivalent initiatives that do not entirely fit the descriptions of the above services

The DHBs were asked if they operate any equivalent initiatives that do not entirely fit the descriptions the questionnaire have used. Ten DHBs responded, of which four DHBs (small: Q;

DHBs classified by size: Small: C, G, Q, Medium: B, D, L, K, H, F, Large: E, A, I, M, N and P

medium: L, H, F) reported 'No' and five reported they had operated equivalent initiatives. The following are DHB's responses:

Small DHBs:

- One DHB (G) reported that although they had hospital at home team but this was an informal service provided by CNS cardiac nurses who provided home visits and did follow up after discharge.

Medium DHBs:

- One DHB (B) indicated they operated nurse-led clinics.

Large DHBs:

Three DHBs (A, N and M) provided a detail description of other initiatives offered.

- DHB (A) indicated that they had recently submitted a business case for a health psychologist in CHF/Diabetes. One other DHB (N) reported that patients are seen on wards or clinic as required but this service element was poorly resourced to manage it. Staff within this DHB tried to provide key education to community nurses e.g. in rest homes, practice nurses, DSM Nurses and were available to support and advise. They also had a video/DVD on Low Salt diet along with a Heart Failure pack to give out to patients and families.
- Lastly, one DHB (M) described their staffing levels in relation to case management. Instead of explaining particular initiatives, this DHB reported that in year 2006, only one Heart failure Nurse Specialist was employed and no dedicated SMO tenths were available. Thus, specific HF activities were limited to high risk patients involving a combination of case management, home visits and clinics (Funding in 2006 1FTE Heart failure Nurse Specialist). In July 2007, further funding became available to employ 3 FTE Heart Failure Nurses, 0.5 FTE SMO dedicated to Heart failure management and additional funding for primary care management. Since that time the services offered to heart failure patients have increased but this is still in the process of development including roll out to primary care. (Budget in 07/08 year= \$400,000 and includes HF nurses, SMO and primary care funding).

J. Initiatives DHBs tried to implement but were unsuccessful

Five DHBs (C, K, A, N, M) talked about the initiatives that were unsuccessful and five DHBs (small: G; medium: B, L, H, F) reported that they did not have initiatives that they tried implementing that were unsuccessful. The following are the DHB's responses:

Small DHBs

- One DHB did not respond (Q). Another DHB (G) said they had implemented no initiatives that were unsuccessful. DHB C reported they had tried implementing a Heart Failure Support Group which was unsuccessful. However, they did not provide further detail.

Medium DHBs

- Four DHBs (B, L, H and F) reported they had not tried to implement initiatives that proved unsuccessful. One DHB (K) reported they tried to implement CHF group sessions that run along the same lines as post-Myocardial Infarction (MI) rehabilitation programmes. The difficulties they encountered were complexity of patients; difficulties with titration; time;

DHBs classified by size: Small: C, G, Q, Medium: B, D, L, K, H, F, Large: E, A, I, M, N and P

availability of staff; age; location; lack of physiotherapies; social worker; clinical nurse specialist for HF.

Large DHBs

- Three DHBs (E, P and I) did not respond to this question. Three other DHBs gave detail regarding the initiatives they had tried. One (M) explained that it was a challenge to get funding for nurse specialist for Heart Failure Service. It took them 3 years to get original funding for 1FTE Nurse Specialist for Heart Failure, stating it was “an uphill battle all the way.” Subsequent funding was more successful in 2007 allowing an increase in HF service but this is still in process of development.

Another large DHB (N) reported that they tried setting up a Nurse led Heart failure Clinic, however, was not successful. The barriers they encountered were firstly, the DHB could not be convince of a clear case of need for a Nurse-led Heart Failure Clinic. Secondly, there was a focus on utilising other ways of contacting or meeting patients, for instance there was a greater emphasis on home visiting. In addition, it was time consuming, as it could take a minimum half a day for a home visit, therefore might not be able to respond promptly when patients’ needs arise. Thirdly, patients do not always want to just see a nurse at the clinic.

Lastly, for elderly or distant patients, Nurse-led heart failure clinic is not an easy option.

Finally, one DHB (A) commented that the initiative that was unsuccessful was not an initiative of the DHB, but a GP programme (five years or more earlier) that was not successfully implemented.

Problems had included IT based pathway which necessitated a significant amount of secondary care input (ECHOs on demand) and specialist back up, which was not discussed in advance.

K. Initiatives DHBs would like to implement

Lastly, DHBs were asked about the initiatives they would like to implement. Five DHBs (small: Q; medium: L; large: E, I, P) did not respond. The responses of the others are summarised are as follow:

Small DHBs

- One DHB (G) expressed that they would like to implement Heart Failure clinics with a designated physician and a nurse specialist team. Barriers preventing this initiative were identified as lack of funding for nursing hours and lack of specific physicians for heart failure.
- Another DHB (C) reported that they would like to have clear pathways and protocols agreed by all hospital and Primary Health. They would also like to further develop fine tuning management for CHF patients. Moreover, they were also hoping to fund a PHO to implement a long term conditions programme with all GPs. Currently their hospital was undertaking a “Patient Journey” project across primary and secondary health sectors.

Medium DHBs

- One DHB (B) reported wanting to improve acute management for CHF through increasing specialist nurses’ involvement in ward and MDT to provide more efficient and effective patient management prior to discharge. This DHB would also wanted to establish HF education and/or exercise group along with a day-stay for fluid management service with multidisciplinary input.

- Another DHB (K) said that they would like to establish a patient support group, have a heart failure nurse specialist available 7 days week, get an education package and training for staff to ensure succession planning, have physician or cardiologist availability in the community, get a hypertensive/ risk management clinic for BP management, and develop rural CHF nurse-led clinics.
- One DHB (F) stated that they would like to establish support from cardiologists to lead the services for CHF and develop linkages with GPs.
- Lastly, another DHB (H) reported that an echocardiography audit programme was planned to commence. They would also like an increase in medical outreach service to attend to the less-high users on a short term basis to provide them with education programmes and support them to monitor and manage their conditions.

Large DHBs:

- Another DHB (A) indicated that if they had more resources they would like to expand their CHF service and establish a MDT for vertical integration (disease specific). However, their priority was on managing waiting list for cardiology secondary and tertiary intervention.
- The third DHB (M) commented that they would like an increase in resources to manage CHF patients in the community, also to improve discharge planning and transition from hospital to the community.
- Lastly, one large DHB (N) identified existing gaps within their service provision for CHF, including nurse-led service/clinic; home visit on request and flexible diuretic regime. This DHB also wished to work on cultural specific initiative. However, they claimed that problems were beyond their ability to remedy. They were hoping to develop packages of care for patients with CHF that are easily accessible. They also wanted to strengthen caregivers' ability to assess patient with self-management monitoring (e.g. medication overnight and weighing when they cannot themselves). Lack of infrastructure and support were issues; they would like their nurses at the nurse-led initiatives to concentrate on patients rather than administrative work, therefore support such as a secretary was ideal. Moreover, this DHB wanted to establish Community Allied Health Team- that is responsive, available and educated to assist patients. Finally, this DHB wished to have support for purchasing of scales and preferably looking into developing ways of having scales that alarm at 2kg variance.

L. Summary of evidence-based CHF service provision by DHB size

The table below summarises CHF service provision according to DHB size (those DHBs not providing a response are excluded).

Table 3: Summary of CHF service provision according to DHB size

	Small DHBs (%) positive response	Medium DHBs (%) positive response	Large DHBs (%) positive response
Audit/Quality Improvement for Patients admitted with CHF	0	60	60
Leadership in CHF	0	40	33
Protocols/guidelines for CHF management	50	60	50
Echocardiography	67	100	100
Hospital at home teams for acute CHF exacerbations	33	40	0
Discharge planning for CHF patients	33	40	83
Audit/quality improvement programme for discharge planning	Nil response	Nil response	100 (Only 1 DHB responded)
Outpatient based CHF management service	33	100	100
Audit/quality improvement programme for outpatient CHF service	0	0	40
CHF self-management education programme	50	60	83
Audit/quality improvement programme for CHF self management	0	0	25
CHF Case management	50	80	50
Audit/quality improvement programme for CHF case management	Nil response	Nil response	100 (Only 2 DHBs responded)
Palliative care for CHF patients	50	100	83

M. Discussion and Comments

Congestive heart failure is a major clinical condition with increasing prevalence and high annual mortality rates often exceeding 20% even after institution of contemporary treatment. The true community prevalence of heart failure in New Zealand is unknown although is projected to affect approximately 2% of the adult population (at least 80,000 people), and prevalence is strongly age related, affecting 1 in 10 people over the age of 80. Each year there are 12,000 hospital admissions of patients with CHF, with average length of stay 7 days.

The Heart Failure Questionnaire was completed by 14 DHBs, although information from many sections was not available from all 14. There was reported to be an average of 372 patients with heart failure admitted to the DHBs, although there was a wide range, 35 - 923 patients admitted, reflecting the varying size of the DHBs. The majority of these patients (two thirds) were managed under general medical services, with the remainder within cardiology or older people's health services. This would be expected given the demographics of most heart failure cohorts. It is

interesting to note that the majority of DHBs (10/13) did not have clinical leadership in heart failure and only seven out of 13 DHBs reported having quality improvement programmes or audit for management of heart failure patients. Heart failure management is strongly evidence-based^{1,2} and thus audit/quality improvement initiatives are an essential part of implementation of evidence-based management. There is a clear need within New Zealand for improvements in audit of care for patients with heart failure to ensure that optimal evidence-based healthcare is delivered for all patients. Such audit processes should occur in hospital but equally need to occur in primary care, as most heart failure patients are managed primarily in the community.

Adequate investigation of patients with the syndrome of heart failure is essential to assist in identifying the underlying aetiology of heart failure and to direct appropriate therapeutic intervention.¹ Imaging of the heart is considered to be an important part of investigation and the usual imaging modality is echocardiography. Echo services were offered by all DHBs except for one small DHB. The responses to the questionnaire suggest that echocardiography services are available for in-patients with heart failure. However, there was a wide range of waiting times for echo services: this is likely to be a more important issue for outpatient rather than in-patient echocardiography. Anecdotally the commonest request from general practitioners in New Zealand in relation to improved health care delivery for the management of patients with heart failure is for enhanced access to echocardiography services. The data from the current questionnaire does not address this issue, although the wide range in waiting times for echocardiography will impact on access to this service by general practitioners. Timely investigation, including echocardiography, is important once heart failure has been diagnosed to allow appropriate management to be initiated as rapidly as possible. Long waiting times for outpatient echocardiography represents a major barrier to healthcare delivery for patients with heart failure.

Patients hospitalised with heart failure are at high risk for readmission within the following 3-6 months. The transition from the hospital to community is an important step to improving care for patients with heart failure. Hospital discharge planning alone has been shown to decrease hospital readmissions in short-term follow-up³ and hospital readmissions were markedly decreased in a management study that involved careful stability criteria before hospital discharge.⁴ Thus, appropriate discharge planning is an important process in improving heart failure management. It is encouraging to note that 8 of the 14 DHBs had specific discharge planning for patients with heart failure. Details on the structure of such discharge planning were not available. Audit processes around discharge planning appear lacking.

Randomised, controlled trials have now clearly demonstrated that a variety of different models of healthcare delivery can improve quality of life, decrease hospital readmissions and improve survival for patients with heart failure.⁵⁻⁷ These trials have involved different interventions, differing patient groups, and include various components of the Chronic Care Model. The comments below discuss the data from the major sections in the questionnaire:

Hospital at home teams

Hospital at home services specifically for patients with heart failure have not been evaluated in the clinical trials of the management interventions. Only 3 of the 14 DHBs offered any form of "hospital at home" service, although it is uncertain of the exact format of these services. There is an overlap

between providing simple interventions for patients in their home compared to more structured services to deal with exacerbations of heart failure at home.

More generally, home-based, nurse-directed management programmes can have a significant impact for patients with heart failure.⁸⁻¹¹ Many patients with heart failure are elderly and access to hospital-based clinics may be difficult. Home visiting allows the provision of education and other strategies within the context of the patients own surroundings and allow tailoring of the programme to the individual patient. The specifics of which home-based interventions are available in New Zealand were not available from the current questionnaire.

Outpatient based management.

Outpatient based management may occur in different locations including hospital outpatient clinics, patients home and primary care. The current questionnaire did not assess management specifically in primary care, and thus most of the data relate to the interventions delivered from the hospital rather than directly from the PHOs. Encouragingly, 12 of the 14 DHBs provide some form of outpatient based management for patients with heart failure. These services are provided by a range of healthcare professionals including cardiac rehabilitation nurses, specific heart failure nurse specialists, district nurses, and existing medical outpatients services. Audit of heart failure management in this setting was lacking.

Case-management of complex patients with heart failure was provided by 8 of the 14 DHBs, with such services provided by existing outpatient services or dedicated heart failure nurse specialists. The clinical trials often focused on management of patients at high risk of subsequent readmission, who were thus often complex patients to manage. Such patients are often difficult to manage by general practitioners alone and thus the ability for DHBs to offer assistance with management is an important component of healthcare delivery for patients with heart failure.

Self management and education are important for patients with heart failure. Such intervention may have impact when delivered alone¹² but is probably more important as part of broader model of healthcare delivery for patients with heart failure.⁷ Nine of the DHBs offered specific programmes in self management. It is likely that the impact of other interventions will be less effective if self management aspects are not provided. The specific components of self management also appear variable, probably reflecting the lack of specific tools to assist education of patients with heart failure regarding their condition and self management.

Telemonitoring

Telemonitoring or structured telephone support (remote monitoring) can reduce all-cause mortality and heart failure readmissions.⁵ Telemonitoring is a means to systematically organise effective care and can enhance existing healthcare services. At the time of this questionnaire, only 3 DHBs offered telemonitoring for patients with heart failure. It is unclear which models of telemonitoring were available and how these interacted with other healthcare services. Telemonitoring in general is a relatively new concept to New Zealand, while such services may enhance delivery of care a challenge is to determine the best means of integration of telemonitoring with existing healthcare services in a cost-efficient way. Thus, it seems reasonable that telemonitoring was not widely available at the

time of this questionnaire. DHBs should work together in this area to determine the optimal use of these technologies in the New Zealand environment.

Palliative care

The management of patients with end-stage heart failure has not been a major part of palliative care services in the past. End of life care for patients with heart failure represents many challenges and referrals of non-cancer patients, including patients with heart failure, to palliative care are increasing. The majority of DHBs offered palliative care support for patients with end-stage heart failure. In general, these services appeared to be within the existing palliative care services offered by the DHBs. While at present the number of referrals to such services appears relatively small, the increased awareness of end of life care for patients with heart failure will need careful planning by DHBs for expansion of palliative care services, especially in the community.

Heart failure affects all ethnic groups in New Zealand. Heart failure among Māori occurs on average 10-15 years earlier than for non-Māori. Mortality from heart failure is approximately 8 times higher among Māori males aged 45-64 than non-Māori and approximately 3½ times higher among Māori aged >65 years. Hospital admissions for heart failure are 8-9 times higher among Māori compared with non-Māori.¹³ Similar discrepancies exist for Pacific people who also develop heart failure 10-15 years earlier than non-Pacific people. The current data report that cultural specific programmes were not provided by 12 of the 14 DHBs at the time of the survey.

Common themes have emerged from this questionnaire of the DHB management of patients with heart failure with regard to audit and funding. In general, there appears to be a lack of specific audit and quality initiatives to monitor and improve the delivery of health care for patients with heart failure. Funding for specific aspects of heart failure management appear to vary widely across the DHBs. Funding represents one important barrier to implementation of effective models of healthcare delivery for patients with heart failure. To some degree regional variations that have been demonstrated from the current data should be expected given the wide range in populations served by the DHBs. However, the models of healthcare delivery should be structured around interventions that have been proven to improve health outcomes, and thus if implemented appropriately will reduce this variation across the country.

Conclusions

Evidence-based healthcare delivery for patients with heart failure improves quality of life, reduces all-cause mortality, decreases all-cause readmissions and decreases heart failure readmissions. Consequently, implementation of appropriate models of care will have substantial impact for both patients with heart failure and the healthcare system in New Zealand. The current data from 14 DHBs in New Zealand demonstrate that while some initiatives are being implemented among the DHBs these interventions vary widely in structure and content, funding is variable and in general insufficient and audit processes are lacking. Culturally specific programmes are not being delivered. Despite differences in potential models of care, common themes, such as the important role of the heart failure nurse specialist, need to be recognised by the DHBs and appropriately resourced and supported. Currently the wide range in waiting times for simple investigations, such as with echocardiography, will have a significant negative impact on the delivery of appropriate health care

for patients with heart failure. Delivery of timely access to these investigations is an important part of improving care for patients with heart failure.

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Chapter 5: COPD Analysis

The COPD questionnaire was completed by 15 DHBs¹¹. The DHBs were clustered by size for ease of analysis¹². There were three small (C, G, Q), six medium (B, D, L, H, F, K) and six large DHBs (A, E, I, M, N, P). This breakdown is in accordance with the MoH breakdown by population. The following section describes the analysis of these questionnaires. The analysis considers an overview of patient demographics and services provided.

DHB size	DHB code
Small	C, G, Q
Medium	B, D, L, H, F, K
Large	A, E, I, M, N, P
Total	15

Large DHBs had a higher number of inpatients (mean of 749 patients, range 351 to 1217 patients) than medium DHBs (mean of 305 patients, from 208 to 576 patients) and small DHBs (mean of 162 patients, range 108 to 265 patients).

A: Demographic information

In total, 14 DHBs provided patients' demographic information, although one medium DHB (K) did not provide this data. More male (56%, range 41% to 100%) than female (44%, range 0% to 59%) with AECOPD were admitted as inpatients in 2006. Most inpatient admissions were NZ European (79%, range 52% to 100%), followed by Maori (13%, range 0% to 38%), people of 'other ethnicity' (6%, range 0% to 16%), Pacific (3.0%, range 0% to 22%) and Asian (0.3%, range 0% to 1.7%). Mean age of NZ European patients was 74 years (range 69 to 82 years), 71 years for 'other ethnicity' (range 63 to 76 years), 72 years for Asian (range 62 to 80 years), 65 years for Pacific (range 50 to 78 years) and 63 years for Maori (range 58 to 68 years).

DHB B provided further comment by specifying that it did not have a respiratory ward, and instead transferred patients into older person's services. DHB N commented that respiratory medicine admits all acute respiratory conditions.

¹¹ DHBs that are included in this analysis are: C, G, Q, B, D, F, H, L, K, A, E, I, M, N and P

¹² DHBs were categorised into small, medium and large DHB by provider arm revenue. The MoH used the same classification for the 'DHB hospital Benchmark information report (March 2008)'.

Admission

Most inpatients with AECOPD were admitted by General Medicine (mean 67%, range 0% to 100%), 22% Respiratory services (range 0% to 100%; some DHBs do not have a Department of Respiratory Medicine [see below]), 4.4% by other departments (range 0% to 11%) and 1.2% by Older Peoples Health (range 0% to 12%). One medium size DHB (L) did not respond.

Initial management

In eight of 14 DHBs (small: C, G, Q; medium: D, F, L, H, B), all AECOPD patients were managed on a General Medical Ward. One medium DHB did not respond (K). Of 14 DHBs, a mean of 81% (range 20% to 100%) of patients were managed on a General Medical Ward, 14% on a Respiratory ward (range 0 to 80%) and 0.8% on Geriatrics Services (range 0 to 11%).

Audit process or quality improvement programme

Five DHBs (33%; medium: D, K; large: P, I, N) reported they had an audit process or quality improvement programme for the management of patients admitted with AECOPD. Nine DHBs (67%; small: C, Q; medium: F, H, B, L; large: A, E, M) reported that they did not have such a process or programme. A large DHB (M) added the rider that some audit indicators were captured non-systematically. DHB G did not respond.

The five DHBs that reported they had audit processes or quality improvement programmes were asked about the clinical indicators that they employed. One DHB (I) reported they had no specific indicators, and others are reported below:

- *'COPD -KPI- although not supported to monitor database'* (D)
- *'As part of Winter planning process, we look at known COPD patients that have been classified according to the GOLD standard, or those that are unknown with a positive chest x-ray, symptoms of primary COPD, i.e. SOB, persistent cough, increasing sputum.'* (K)
- *Average length of stay and readmissions rate* (P and N)
- *Mortality rate and use of Spirometry in acute admission* (N)

One DHB (M) that reported not having audit processes or quality improvement programmes specified that although it lacks a DHB-wide audit for COPD, some audits and indicators are captured within involved services, but these are not audited systematically across the DHB.

B: Staffing

Overall leadership

Eight of 15 DHBs (54%; small: C; medium: D, F, B; large: P, I, E and N) had an individual with overall leadership in COPD and seven DHBs (47%, small: Q, G; medium: L, K, H; large: A and M) did not. One medium DHB (F) reported that losing a doctor in the near future would jeopardise this leadership role. A large DHB (M) reported that within their respiratory medicine department there was a leadership role for the COPD clinic, oxygen service, and for pulmonary rehabilitation, but that individual had no authority to directly influence other relevant services (e.g. General Medicine).

Respiratory Medicine Department

Nine of 15 DHBs (60%; medium: D, F, K, B; large: P, I, E, M, N) had a respiratory medicine department. All three small DHBs (C, G, Q), two medium DHBs (L, H) and one large DHB (A) (40%) did not. A small DHB (C) reported that they had employed a Respiratory Clinical Nurse Specialist who worked across the hospital and community settings, including with primary health and Maori health

providers. A medium DHB (D) reported that it provided a sleep service, a community sleep service, and a respiratory lab.

Staffing levels

The nine DHBs were asked to provide staffing levels (FTE in Respiratory Medicine) in respiratory physicians, nursing, clinical psychology, occupational therapy, physiotherapy, respiratory technicians/scientists, dieticians and administrative staff.

DHB Q, which did not have a respiratory medicine department, reported they had 1.3 FTEs in nursing, 1 FTE Respiratory technician and 4 FTEs in general physicians. Of the nine DHBs that had a respiratory medicine department, three (K, M and N) did not indicate staffing levels in that department. For the medium DHBs; DHB D reported they had 2 FTEs in respiratory physicians and 6.5 FTEs in nursing. DHB B reported they had 0.7 FTE respiratory physician, 2.4 FTEs in nursing, 1 FTE in physiotherapy and 0.6 FTE in respiratory technician/scientist. DHB F indicated that they had 0.5 FTE in Respiratory Physician, 1.8 FTEs in Respiratory Technicians/Scientists and 1 FTE in Administrative staff. In large DHBs, DHB I stated they had 4.11 FTEs in respiratory physicians, 5.9 FTEs in nursing, 0.3 FTE in clinical psychology, 0.5 FTE in physiotherapy, 1.1 FTEs in respiratory technicians/scientists, 2.5 FTEs in administrative staff and 3 FTEs in community health workers. Finally, for DHB E, their respiratory department had 8 FTEs in respiratory physicians, 10.6 FTEs in nursing, 0.5 FTE in clinical psychology, 1.1 FTEs in respiratory technicians/scientists and 8.7 FTEs in administrative staff.

However, it is important to note that the above represents total respiratory FTEs and thus does not give an insight into the level of commitment to COPD.

Protocols or endorsed guidelines for management COPD

Nine DHBs (60%; small: G; medium: D, F, L, K, B; large: P, I, N) had protocols or endorsed guidelines for the management of COPD and six DHBs (40%; small: C, Q; medium: H; large: A, E, M) did not. Two DHBs that did not have protocols or guidelines made further comments; one small DHB (C) reported that they had protocols and guidelines in the community but not for the hospital setting. Another large DHB (M) reported that their respiratory service had protocols for most aspects of COPD care and they had a section on their care in the RMO handbook but there was no endorsed DHB-wide guideline which applied uniformly from ED through the various other services to the respiratory service.

Six DHBs reported the protocols or endorsed guidelines that they used for the management of COPD:

- *Respiratory resource manual (G)*
- *COPD Integrated Clinical Pathways guideline; COPD Guidelines; (Guidelines on COPD pathways guideline for the exacerbation of COPD.) (B and D)*
- *Use Australian/ NZ guidelines; COPD-X (B)*
- *The Global Initiative for Chronic Obstructive Lung Disease -GOLD (B, P, K, F)*

C: Spirometry

Fourteen DHBs offered spirometry service in their DHB, one DHB (L) did not respond. Six DHBs (B, D, H, F, N, and M) gave additional comment:

Medium DHBs:

“Community Spirometry funded for 150 tests per year. PFT service (1/2 time).” (B)

“Accredited lab. Spirometry also in ED and Medical wards. Also maintain a community based spirometry service throughout the region.” (D)

“This is carried out in a variety of settings e.g. in wards by patients, in ED, by the oxygen nurse (community nursing) and by the medical outreach team.” (H)

“One hospital provides an excellent service that the respiratory nurses service and general practitioners may refer to.” (F)

Large DHBs:

We have a ward based spirometry service via the ECG technicians (suitably trained and regularly recertified) plus access to full lung function testing for in-patients where appropriate. (M)

“Full lung function laboratory available. Working with GPs to increase GP spirometry.” (N)

Demographic information

Only two DHBs (14%; small: Q; large: E) gave demographic information of patients that accessed spirometry services in 2006. Twelve DHBs (86%; small: C, G; medium: D, F, K, H, B; large: A, P, I, M, N) did not provide demographic data.

From the data of the two DHBs, it appears that similar percentages of male (mean 53%, range 51% to 55%) and female (mean 47%, range 45% to 49%) patients accessed the service. The majority of patients were NZ European (81%, range 70% to 93%). Patients of ‘other ethnicity’ made up 3.1% (range 2% to 4.2%), 4% (range 2.9% to 5%) were Maori, 1.5% (0% to 5%) were Pacific people and 0.5% (range 0% to 1%) were Asian. The mean age of NZ European was 61 years, of the mean for ‘other ethnicity’ patients was 62 years, the mean for Asian patients was 57 years, the mean for Pacific patients was 51 years and for Maori was 52 years.

Referral process

Ten DHBs responded to this section about referral processes. The spirometry services of eight DHBs (53%; Small: C, Q; Medium: B, F, H; Large: E, N, P) were open to referral from both primary care and hospital physicians. Two large DHBs (13%; A and I) reported they accepted referral from primary care. Four DHBs (Small: G; Medium: D, K, Large: M) did not respond.

Staffing level for spirometry service

The staffing level supporting spirometry service for DHB Q (small) was 1 FTE. DHB C reported that the respiratory nurse specialist provides spirometry in the community and does clinics at some GP practices and that three GP practices had their own spirometer. The medical technician performs spirometry at outpatients and for inpatients this was only a small portion of her role. DHB F (medium) indicated that their service had 1.5 FTE in respiratory technologist and 1 FTE in respiratory technician. DHB H stated that a range of nurses carried out spirometry service. DHB I (large) reported they had 0.5 FTE respiratory technicians and 0.1 FTE for SMO. DHB A indicated that spirometry was carried out by Outpatients Dept nurses in addition to their usual commitments. DHB B stated that their service had 0.6 FTE in Respiratory Technicians and 0.6 FTE in respiratory Physiotherapist (community spirometry clinics). Lastly, DHB E (large) reported they had 5.5 FTEs in respiratory scientists. DHB P reported that spirometry was incorporated into a sleep and respiratory

laboratory with 3.4 FTEs for technologists. Six DHBs did not respond (small: G; medium: D, K, B; large: M, N).

Unfortunately our questionnaire did not clearly distinguish spirometry services from the pulmonary function laboratory service.

Funding for Spirometry service

Nine DHBs (64%; small: Q, C; medium: B, F, H; large: A, I, E, P) received recurrent (guaranteed) support for their spirometry service and this came from overall funding for the department rather than being ring-fenced. DHB P recorded that it received recurrent (guaranteed) funding, although it did not specify whether or not the service was funded specifically or as part of overall department funding. DHB B specified that community spirometry funded 150 tests per year and were currently completing 450+ tests per annum. Six DHBs (50%; small: G; medium: D, K, L; large: M, N) did not respond.

Audit process or quality improvement programme for Spirometry Service

Only five DHBs (33%; small: Q; medium: F; large: E, I, N) reported they had an audit process or quality improvement programme for their spirometry service and five DHBs (36%; small: C; medium: B, H; large: A, P) indicated the opposite. Five DHBs (small: G; medium: D, K, L; large: M) did not respond. Two of the DHBs with an audit process indicated the 'clinical indicators' they used:

Medium DHB (F):

'ATS/GRS task force guidelines on standardisation of spirometry'

Large DHB (E):

'Biological control programme';

'Quality control for calibration';

'Patient satisfaction surveys'

D: Pulmonary Rehabilitation

The majority (93%) of participant DHBs operated a pulmonary rehabilitation service. Only one medium sized DHB (L) did not. Further comment was provided by three DHBs.

Small DHB:

- *"Only commenced in 2007 so 2006 data not available." (Q)*

Medium DHB:

- *"In the process of delivering in partnership with primary and secondary services across the region." (D)*
- *One hospital runs pulmonary rehabilitation while another hospital runs these services through physiotherapy. (F)*

Demographic information

Only three DHBs (21%; small: C; Large: E, P) gave demographic information regarding patients that accessed pulmonary rehabilitation in 2006. Eleven DHBs did not provide demographic data (79%; G, Q, B, D, H, F, K, A, I, M, N).

Across the three DHBs, a higher percentage of females (59%; range from 46 to 68%) than males 40% (range 32% to 53%) accessed pulmonary rehabilitation. Most patients were NZ European (mean 75%; range 55% to 89%), followed by patients from other ethnicity (mean 22%; range 8.4% to 36%), Maori (mean 11%; range 2.5% to 20%), with roughly 0% Pacific and Asian. The mean ages of patients who accessed this service by ethnicity was 64 years for 'other ethnicity' (range 56 to 73 years), 66 years for NZ European (range from 65 to 67 years), and 57 for Maori (range 52 to 61 years).

Duration of the pulmonary rehabilitation programme

Only seven DHBs (small: Q; medium: B, F; large: I, E, P, A) reported the duration of their programme. Across these DHBs, the mean duration was seven weeks (range 5 to 8 weeks). DHB C stated that their programme had been on a continuous roll-on and roll-off throughout most of the year, but did not specify the programme duration.

Training programme

Eight DHBs (small: Q, C; medium: B, F, H; large: I, P and E) offered both endurance and strength training in their programme. DHB A offered only endurance training in their programme.

Staffing level for this service

In total, seven DHBs provided rehabilitation staffing level details. DHB Q, indicated that they had no respiratory physicians, but 4 FTEs general physicians, 0.2 FTE in nursing and 0.5 FTE in physiotherapy. DHB C reported they had 0.2 FTE in nursing and 0.2 FTE in physiotherapy. DHB B reported they had 0.2 FTE in Physiotherapy. DHB F had 0.5 FTE in Nursing, 4 hours/year FTE in Clinical Psychology, 2 hours/year FTE in Occupational Therapy, 32 hours/year FTE in Physiotherapy and 4 hours/year FTE in Dieticians. DHB H had 0.2 FTE in Physiotherapy. DHB I indicated that they had 0.1 FTE in Respiratory Physicians, 0.5 FTE in Nursing and 0.5 FTE in Physiotherapy. DHB E reported the staffing level that support an eight weeks pulmonary rehabilitation programme, including one hour of Respiratory Physician, 40 hours in Nursing, two hours in Clinical Psychology, one hour in Occupational Therapy, 40 hours in Physiotherapy, one hour of Dietician and one hour of Social Worker. DHB N had 0.5 FTE in Nursing, 2 hours/year FTEs in Clinical Psychology, 2 hours/year FTEs in Occupational Therapy, 0.35 FTE in Physiotherapy and 2 hours/year FTE in Dieticians. DHB A indicated using 0.8 FTE in Physiotherapy.

Referral process

Ten DHBs responded. The pulmonary rehabilitation service of six DHBs (43%; small: Q, C; medium: B, F; large: E and I) was open to referral from hospitals physicians and primary care; in four DHBs (29%; medium: H; large: A, N and P) the service was open to referral from hospital physicians only.

Programme base

Ten DHBs responded. The pulmonary rehabilitation programme of five DHBs (36%; medium: F, H; large: P, E, A) was hospital based, the programme of one small DHB (C) was community based, and in

four (29%; small: Q; medium: B; large: N and I) the programme was a combination of hospital and community-based.

Ongoing home based exercise programme

Four DHBs (29%; medium: F; and Large: E, N, P) operated an on-going home-based exercise programme. Six DHBs (43%; small: Q, C; medium: B, H; large: A, I) reported the opposite. Four DHBs did not answer this question.

Other forms of on-going support

Seven DHBs (50%; small: C, Q; medium: B, F, H, large: N, P) reported that they offered other forms of ongoing support for COPD patients. Three large DHBs (21%; Large: A, I, E) indicated the opposite. Four DHBs did not respond.

Other community based services

Five DHBs (36%; Medium: B, F and H; Large: N and P) reported that they offered other community based services and another five DHBs (36%; Small: C, Q; Large: A, I, E) did not offer other community based services. Four DHBs did not respond.

Funding for pulmonary rehabilitation programme

Nine DHBs (64%; Small: C, Q; Medium: B, H; Large: A, I, E, N, P) reported that their pulmonary rehabilitation programme was supported by recurrent and guaranteed support, in which the funding of seven was from within their overall respiratory budget. Five DHBs did not provide a response.

Audit process or quality improvement programme for pulmonary rehabilitation service

Of the 14 DHBs that indicated that they had pulmonary rehabilitation service, seven (50%; Small: Q; Medium: B, H; Large: N, P, I, E) had an audit process or quality improvement programme for this service. Two DHBs (14%; C and F) said they did not. Five DHBs (29%; G, D, K, A, M) did not respond. The four DHBs that had an audit process or quality improvement programme were asked about the clinical indicators they used; only three responded and the 'clinical indicators' they reported using were:

- *The six minute walk test(Q, H);*
- *Chronic respiratory index questionnaire(Q);*
- *Hospital anxiety and depression scale(Q);*
- *Service attendance(Q);*
- *Functional goals(H);*
- *Patient reassessment immediately post course to document outcomes(E);*
- *Feedback questionnaire(E);*
- *Quality of Life questionnaire, MMRC, Walking distance (B);*
- *Patient satisfaction survey (P);*
- *Pre and post programme quality of life assessment (P)*

E: Long Term Oxygen Therapy (LTOT) and other O₂ services

All DHBs provide assessment for LTOT. DHB F specified that although it provided long term follow-up, it was not able to provide this as effectively as possible due to inadequate funding of FTE in this area. DHB B further commented that it provided non-invasive ventilation for acute exacerbations of COPD.

Demographic information

Demographic information of patients who accessed LTOT was gathered from six DHBs (small: C, Q; medium: L, H; large: P, and E). Eight DHBs did not respond (G, D, F, K, B, I, M and N) and one DHB (A) said they were unable to provide data.

Data from the six respondent DHBs showed that on average, a similar proportion of male (53%; range 42% to 64%) and female (47%; range 36% to 58%) patients accessed LTOT in 2006. Patients were predominantly NZ European (mean 77%, range 54% to 90%), followed by Maori (mean 13%, range 1.6% to 41%), 'other ethnicity' (mean 7%, range 0% to 18%), Pacific (mean 1.1%, range 0% to 2.4%) and Asian (mean 0.3%, range 0% to 1%). The mean ages of these patients were; 70 years for NZ European (range 65 to 78 years), 66 years for patients from 'other ethnicity' (range 56 to 75 years), 73 years for Pacific (range 58 to 85 years), 60 years for Maori (range 52 to 69 years) and 48 years for Asian (range 44 to 52 years).

Service lead for LTOT assessment service

Six DHBs (40%; small: C; medium: B, L, H; large: E and I) indicated that they had a designated medical lead for LTOT assessment service; Four DHBs (27%; small: Q; medium: F; large: P, A) did not, and five DHBs (small: G; medium: D, K; large: M and N) did not respond.

Who conducts the assessments

Four DHBs reported 'physicians' (27%; medium: F, L; large: A, P), three DHBs reported 'nurses' (20%; small: Q; and medium: B and H) and three DHBs reported both physicians and nurses (20%; small: C; large: E and I) carried out the LTOT assessments. No DHB reported that LTOT assessment was conducted by physiotherapists or respiratory technicians/scientists.

Referral process

Of the ten DHBs that responded to this question, seven (47%; small: C; medium: B, F, H; large: A, N and E) reported that their LTOT service was open to referral from both hospital physicians and primary care. Three DHBs (20%; small: Q, medium: L; large: I) said that their service accepted referral from hospital physicians only.

Ambulatory oxygen therapy

Eight DHBs (57%; small: C, Q; medium: F, L, H; large: A, I and E) reported that they offered ambulatory oxygen therapy. DHB P and B indicated that it did not offer this service. Five DHBs (33%; small: G; medium: D, K; large: M and N) did not respond.

Short-burst therapy

Eleven DHBs (73%; small: C, Q; medium: F, B, L, H; large: A, I, N, P and E) indicated that their DHB offered short burst oxygen therapy. Four DHBs (27%; small: G; medium: D, K; large: M) did not respond.

Non-invasive ventilation for stable COPD

Three large DHBs (20%; E, N and P) indicated that they offered non-invasive ventilation for stable COPD patients. Eight DHBs (53%; small: Q, C; medium: B, F, L, H; large: A, I) reported that they did not offer non-invasive ventilation for stable COPD patients. Once again, four DHBs (27%; small: G; medium: D, K; large: M) did not respond.

Non-invasive ventilation for AECOPD

Eight DHBs (53%; small: Q, medium: B, F, H; large: E, I, N and P) indicated that their DHB offered non-invasive ventilation for AECOPD patients and three DHBs (20%; small: C; medium: L; large: A) reported they did not have such a service available. Once again, four DHBs did not respond.

Written guidelines:

LTOT

Ten DHBs responded to this question; all ten (67%) indicated that they had written guidelines for LTOT. These DHBs comprised two small (C and Q), four medium (B, F, L and H) and four large (A, I, P and E) DHBs. The other five DHBs did not respond.

Ambulatory oxygen therapy:

Seven DHBs (47%; small: C, Q; medium: B, F, L, H; large: A) reported that they had written guidelines for ambulatory oxygen therapy; two large DHBs (13%; I and E) did not, and six DHBs did not give a response.

Short-burst therapy

Seven DHBs (47%; small: C, Q; medium: B, F, L, H; large: A) indicated that they had written guidelines for short-burst therapy; two large DHBs did not (13%; I and E) and six DHBs did not respond.

Funding for LTOT service

Eight DHBs (53%; small: C, Q; medium: B, L, H; Large: A, I and E) who responded indicated that their LTOT service was funded on a recurrent and guaranteed basis, as part of overall funding for respiratory or general medical services.

Audit process or quality improvement programme for LTOT service

Ten of 15 DHBs with LTOT services responded to this question. Only four DHBs (27%; small: C; Large: I, N and E) had an audit process or quality improvement programmes for their LTOT service and six DHBs (40%; small: Q; medium: B, F, L, H; large: A) indicated the opposite. Two DHBs commented further:

- *“Currently we are auditing the 2007 data on oxygen patients which will be presented to the physicians with one of the goals from this being a more uniform approach to the prescribing and re assessing of domiciliary oxygen patients.” (C)*

- *“Audit of Notes; 6 monthly assessments of patients as per national service specifications.” (E).*

F. Hospital at Home Teams for acute exacerbation of COPD

Only one of 15 DHBs (D) indicated that their DHB offered the Hospital at Home Team (early discharge support and/or admission avoidance team) for patients presenting to hospital with AECOPD. One medium DHB (F) answered ‘yes and no’ and explained that follow up was given by the respiratory nurses on referral but not as standard to all discharged patients. The remaining 13 DHBs reported that they did not offer this service, among which eight DHBs made further comments regarding this issue. Two main themes emerged from their comments:

Inhibiting factor: lack of resources

It appears that some DHBs were unable to develop this service aspect due to lack of resources, funding, workforce and support.

- *‘Have tried to set this up but previously declined due to funding constraints.’(B)*
- *‘Limited team through District nursing, specialist respiratory nurse, and home based support.’ (C)*
- *‘There is no senior physician with a dedicated respiratory focus. Respiratory nurses often working in isolation. Respiratory specialist clinics are sporadic and not regular. There is a great need for a respiratory team working together to achieve early discharge and/ or admission avoidance team. Respite care and placement issues are a problem as they are chronically ill at a younger age and COPD is not considered a disability so lack of support from Life Links and CARE.’(G)*
- *‘We have discussed this approach but have not had resource within the DHB to run a pilot (it is resource intensive) to assess what percentage of admissions could be avoided (overseas experience has varied widely reflecting the severity and social circumstances of each health systems/hospitals COPD population) and thus whether this is a worthwhile in terms of cost/benefit. We have a high COPD admission rate in this DHB compared to UK and this may reflect the use of out of hours A & E facilities that do not know the patients “normal” level of function combined with a very elderly COPD population with a lot of co-morbidity and limited social support.’(M)*

Similar services are available or in the process of developing the service

Six DHBs said that they had outreach teams working in the community or provided other measures to prevent admissions. One DHB stated plans to begin the service in early 2008 while another DHB indicated they were redesigning their community service to better-define acute intervention.

- *‘We offer district nursing service, clinical nurse specialist, oxygen/respiratory and medical outreach service for community based patients.’(H)*
- *‘But we do have an outreach team that cares for complex respiratory patients.’(E)*
- *‘Depending on the interpretation of hospital at home being, clinical nurse specialist from ED following up patients at their homes and liaison with primary care, thus preventing*

admissions. We do not have respiratory clinical nurse specialist with case load, managing patients.' (K)

- *'Hospital in home available, but seldom actually involved with patients. We have an active COPD rehab/ management programme and utilise this more for early discharge.'* (N)
- *'Community services are being redesigned at present and will include a more clearly defined acute intervention.'* (C)
- *'Due to start early 2008, funding obtained at first attempt.'* (A)
- *'We do have a POAC scheme and also an Acute Care team who target high users in A&E department, but we do not have a COPD specific programme. We do, have an IV home therapy to prevent admissions and for early discharge and patients are now discharged early to the PDAC programme.'* (I)
- *'We offer district nursing service, clinical nurse specialist, oxygen/respiratory and medical outreach service for community based patients.'* (F)

Second phase questions

The one DHB that ran a Hospital at Home Team for AECOPD did not respond to the second phase questionnaire. Thus no detailed analysis was available to us.

G. Palliative Care Support for COPD Sufferers

Palliative care support was available in 13 DHBs (86%; small: C, G, Q; medium: D, L, K, H; Large: P, I, A, E, M and N). The other two DHBs (20%; medium: F and B) indicated they did not have palliative care support for COPD sufferers, both of which provided further comment. DHB B stated that it recognised this as an area for development and currently utilised specialist hospice services in the community. DHB F stated that historically its hospice has been encouraged to provide this service, although this area needs to be further looked at. Among the 13 DHBs with palliative care support, four DHBs also provided further comment.

Small DHB:

- *"Only provided through district nursing with very limited specialist palliative care support. We are in the process of redesigning our palliative care service which will definitely include end stage COPD."* (C)
- *"Palliative care support provided as part of district nursing service in the DHB."* (Q)

Large DHB:

- *"Rarely used and specific to COPD."* (A)
- *"On occasion we will have end-stage COPD patients assessed by the in-patient palliative care team if deemed appropriate and very occasionally the hospice team have been involved in the care of COPD patients at the end of life but there is a perception that the resource is limited and thus a reluctance to offer this as standard part of the management of advanced COPD. You would have to discuss this with the hospice service to assess their perspective in this regard."* (M)

Demographic information

Demographic information regarding those that accessed the service was available from only one medium DHB (L). The majority of the DHBs (92%; C, G, Q, D, K, H, A, M, P, I, E and N) that reported they had palliative care support did not provide demographic data.

Service provision

Six DHBs responded to this question. Two DHBs (15%; small: C and large: N) indicated that their palliative care supports for COPD sufferers were provided by both COPD specialists and palliative care specialists. Two large DHBs (A and I) and one small DHB (Q) reported that their palliative service was provided by palliative care specialists. DHB L, on the other hand, indicated that its palliative service was neither provided by COPD specialists nor palliative care specialists, although it did not provide further detail to explain this.

Funding for palliative care support

Of those DHBs that responded, four (small: C, Q; medium: L; large: I) received recurrent and guaranteed support. One of these DHBs (I) received ring fenced funding and in the other three (C, Q, and L) palliative care was funded from overall funding for their respiratory or general medical service. Nine DHBs (G, D, K, H, P, A, E, M and N) did not provide this data.

Audit process or quality improvement programme for palliative care support for COPD sufferers

Only two DHBs (15%; medium: L; large: I) had an audit process or quality improvement programme for their palliative care support service, of which one (L) reported that they used accreditation through Quality Health as a quality improvement programme. The other DHB (I) reported no clinical indicators. DHB C reported that it did not have an audit process or quality improvement programme for this service. The rest of the DHBs did not respond (small: Q, G; medium: D, K, H; large: A, P, E, N, M).

H. Smoking Cessation

All 15 DHBs indicated that they had smoking cessation services (either specific for respiratory medicine or generic within the DHB). DHB A indicated that their smoking cessation services were generic. In addition, four DHBs provided further comment.

Medium DHBs:

- *“MOH discontinued funding, although has recently (December 2007) moved to restore services in a new format. The local PHO provides smoking cessation services in the community funded by the DHB, and a limited inpatient service for smoking cessation is funded by the DHB to target high-risk individuals and those that express a desire to quit.” (G)*
- *“Community based provider.” (B)*
- *“This is a limited service that is available but not readily on call due to reduced FTE.” (F)*
- *“This is provided by the hospital not specifically the respiratory service. Also many PHOs also operate a programme.” (I)*

Demographic information

The amount of demographic information regarding the patients who accessed this service in the DHBs was limited as only two DHBs (13%; small: Q; medium: L) provided this. The rest of the DHBs did not provide demographic data (87%; small: C, G; medium: D, F, K, H, B; large: A, N, P, I, E, M).

From the information of two DHBs, more female patients (62%; range 59% to 65%) than male patients (38%; range 35% to 41%) accessed smoking cessation services. It was predominately NZ European patients (72%; range 59% to 85%) who accessed the service, followed by patients from 'other ethnicity' (25%; range 8% to 41%), Maori (9%; range 5% to 14%) and Pacific (0.5%; range 0% to 1%). The mean age of patients who accessed the service was 49 years for patients from 'other ethnicity' (range 46 to 53 years), 45 years for NZ European patients (range 42 to 49 years), 36 years for Maori patients (range 30 to 42 years) and 26 years for Pacific patients (no range).

Referral process

The smoking cessation service of four DHBs (27%; small: C, Q; medium: L; large: A) was open to referral from both hospital physicians and from primary care. Eleven DHBs (G, D, F, K, H, B, P, I, E, M, N) did not respond.

Staffing levels for smoking cessation service

Three DHBs provided their staffing levels. DHB Q (small) indicated that they had 1.5 FTEs. DHB C (small) reported that there was no hospital service, but were currently advertising 0.5 FTE. This DHB also stated that it provided 2 FTE [Maori Quit smoking service] and that all GP practices had at least 1 trained Quit coach (usually a practice nurse) of unknown FTE. DHB L (medium) indicated their smoking cessation service was a generic service, that there was approximately 1 FTE smokefree hospital coordinator and 1.5 FTE staffing (not disease-specific). A large DHB had 3 FTEs.

Funding for smoking cessation service

For those DHBs that responded, four (27%; small: C, Q; medium: L; large: A) received recurrent and guaranteed support for their service. Of these, three (Q, L and A) received specific-ring fenced funding and one (C) received funding as part of overall departmental funding. Eleven DHBs (73%; G, D, F, K, H, B, I, P, E, M, N) did not respond.

Total annual funding for this service

Three of the four DHBs (C, Q and A), who provided funding information above, did not provide further details. Only one DHB (L) stated that they had received recurrent ring fenced funding of \$73,038.

Audit process or quality improvement programme for smoking cessation service

As noted above, all 15 DHBs offered smoking cessation service at their DHBs, however only one small DHB (7%; Q) reported they had an audit process or quality improvement programme for their service. This DHB reported that they used referral rates; nicotine replacement therapy usage and quit rates as clinical indicators. Three DHBs (20%; small: C; medium: L; Large: A) did not have such process, eleven DHBs (73%; small: G; medium: D, F, K, H, B; large: P, E, I, M, N) did not provide this information.

Additional comment

One small DHB (G) cited that the MoH discontinued funding, although they had recently (December 2007) moved to restore services in a new format. The local PHO provided a smoking cessation service in the community funded by the DHB and a limited inpatient service for the smoking cessation was funded by the DHB to target high-risk individuals and those that expressed a desire to quit.

I. Vaccination

Influenza vaccination service was reported to be available as a specific service for COPD patients in four of the 15 DHBs (27%; small: C; medium: K, B; large: N) with 11 DHBs (73%; small: Q, G; medium: D, F, L, H; large: P, I, A, E, M) indicating the opposite. Only two of 15 DHBs (13%; small: C; medium: K) offered a pneumococcal vaccination service to their COPD patients with 13 DHBs (87%; small: Q, G; medium: D, F, L, H, B; large: P, I, A, E, M, N) indicating that they did not.

Comments

Most DHBs commented further on the provision of vaccination; three key themes emerged from their comments, firstly, although specific vaccination service was not offered in most DHBs, patients with COPD were advised and encouraged to have flu and pneumococcal vaccinations.

- *'Advice only is provided. All patients advised to have flu vaccinations, discussion with appropriate patients re pneumococcal vaccination.'* (D)
- *'Influenza vaccination is advised and encouraged to COPD patients...'* (F)

Secondly, comments indicated that those vaccinations are available from the GPs or Primary Health care practices, therefore some DHBs referred their patients to GPs for this service and some GPs had received funding for such service.

- *'In General Practice- YES for Influenza. In Hospital No.'* (E)
- *'As a rule patients attending the COPD clinic or newly diagnosed patients with COPD are advised (as are their GPs) that annual influenza and 5 yearly Pneumococcal vaccination are indicated but the vaccination is done via the Primary Care services and not by our staff or clinics.'* (M)
- *'This is generally provided by GPs. This can be prescribed for inpatients but there is no data on the utilisation of this option.'* (I)
- *'No, we refer patients to their GP as it is a PHO initiative.'* (G)
- *'Some PHOs fund Pneumococcal vaccine free using SIA funds.'* (I)
- *'Influenza [vaccination] encouraged and offered via GP. Pneumococcal not routinely available and not funded. Recommended to individuals as needed. Usually provided via GP.'* (N)

Finally, some DHBs explained the barriers that hindered patients from receiving vaccinations:

Cost barrier

- *'Pneumococcal vaccination is advised...however there is a payment barrier and not all patients can afford it.'* (F)
- *"Influenza vaccination is currently underfunded for secondary services but to meet patients need, we do provide."* (K)

Nurses were under-trained in giving injection

- *'Respiratory nurses are not trained in vaccinations at present.'*(F)

Lack of funding

- *'Funding issue...'* (H)
- *'Have tried to set this up but previously declined due to funding constraints.'*(B)

Lack of leadership

- *'...but also lack of clinical leadership to implement.'*(H)

One DHB (I) that did not offer vaccination services stated that their hospital does vaccinate patients who re-present with pneumonia and all those with COPD.

Demographic information

Unfortunately, no data was available for analysis. One small DHB (C) reported that they could not provide demographic information and three (K, P and N) did not respond. This section was not applicable for the other DHBs, as they did not offer a service.

Funding for vaccination service

Only one DHB (C) responded; they received recurrent and guaranteed support for their vaccination service as part of an overall departmental funding.

Audit process or quality improvement programme for vaccination service

DHB C reported that it did not have an audit process or quality improvement programme for vaccination service. The remaining DHBs did not respond.

J. COPD Patient Self Management and Education Programmes

Specific programmes in self-management and education were offered in nine of the 15 DHBs (60%; small: C, G; medium: D, F, K, B; large: P, M, N), the remaining six DHBs (40%; small: Q; medium: L, H; large: I, A, E) indicated the opposite. The nine DHBs that reported they had such programmes were asked if their programmes involved written action plans; seven DHBs (48%; small: C, G; medium: D, K, B; large: P, N) had written action plans and two DHBs (13%; medium: F; Large: M) did not.

Comments

DHBs that offered COPD self-management and education programmes that involved written action plans offered the following services as part of their programmes:

- *'Most patients with COPD are now managed by nurse practitioners. Those with Cor pulmonale are managed by physicians/ nursing team.'* (D)
- *Nurse led clinics; COPD pathway, Pulmonary rehabilitation.* (B)

One large DHB (M) and one medium DHB (F) that provided self-management and education programmes, but did not have written action plans, made further comments:

- *'As part of the pulmonary rehabilitation programme patients undergo extensive education around COPD, symptom management etc. We do not cover written action plans as done in asthma as they are not well validated and COPD is a much more heterogeneous disease and*

a “one size fits all approach” is not necessarily appropriate for all. Coping with exacerbations and thresholds for obtaining medical advice, commencing antibiotics etc are discussed both in the clinic and Pulmonary Rehabilitation setting.’(M)

- *‘Education and written information is certainly given to patients around self management. Actual written self management medication plans as such as required to be signed off by a GP or consultant at present are considered “prescribing”.’ (F)*

Another (medium) DHB H that reported they did not offer self-management and education programmes for all COPD patients, *did offer* self-management and education for patients with advanced and late stage COPD.

Three other DHBs reported that they did have programmes in use for rehabilitation with COPD patients. For example, one DHB (I) specified that they had available a [community] group and COPD nurse outreach support from PHC Nursing team. In addition, they had both wellness and crisis plans as part of their CCM. They also reported that their diabetes specific self-management programme will extend to all chronic diseases in the future. Another DHB (E) cited that the hospital has a programme that they used for rehabilitation, however, each PHO ‘does something different’. DHB A stated that it has not tried to establish this service because it was not convinced it helps and because of the ‘pressure of clinical commitments.’

Demographic information

Of the nine DHBs with specific programmes in self-management and education, none provided demographic data of patients accessing this service.

Referral process for self-management and education programme

Three DHBs (33%; small: C; medium: B and F) responded to this question. DHB F and B indicated that its self-management and education programme was open to referral from both hospital physicians and primary care. The self-management and education programme in DHB C was open to referral from primary care only. Six DHBs did not provide information regarding their referral process.

Staffing levels

Four DHBs gave a response about staffing levels. A small DHB (C) reported that they had a 1.0 FTE in clinical nurse specialist, and practice nurses (CarePlus) of unknown FTE supporting this service. A medium DHB (F) had a 1.0 FTE employee supporting *asthma* education. Another medium DHB (B) had 1.2 FTEs in Clinical Respiratory Specialist Nurses and 0.5 FTE in Clinical Nurse Manager Respiratory. And a large DHB (N) had 5 FTEs of Clinical Nurse specialists.

Funding for self-management and education programme

Two DHBs (22%; C and B) received guaranteed support as part of overall departmental funding. DHB F reported having an overall departmental funding but did not specify whether it had guaranteed or limited-time support. No other DHB responded.

Audit process and improvement programme for COPD patient self-management and education programme

Only one DHB (N) reported they had an audit process for this service. Two DHBs (22%; B and C) explicitly said that they did not have audit or quality improvement programmes in this area. Most DHBs that had self-management services did not respond.

K. Case Management for COPD

Seven DHBs (47%; small: C; medium: D, K, H; large: I, M and N) operated case management services for patients with COPD and seven DHBs (47%; small: Q, G; medium: L, B; large: P, A and E) said they did not. In addition DHB (F) uncertainly reported 'yes and no', explaining that their patients were followed up until they felt confident managing their condition independently. This DHB also stated that future planning would examine linking with GPs to manage 'community COPD' more effectively.

Five DHBs that operated case management for patients with COPD gave additional comments. Among medium DHBs, DHB K indicated that case management was available for a selected client group with complex frequent admissions and inability to cope with the diagnosis. DHB H reported that they had outreach nurses who each had case load of severe COPD patients. Among large DHBs, DHB M reported that their case management for patients with COPD was historically provided by a COPD nurse specialist attached to General Medicine who case managed 15-20 patients who had a history of frequent presentation to that service. This DHB commented that there had not been the nurse specialist resource to extend the service more widely and they felt that there was only limited evidence of cost/benefit in the NZ situation. DHB N reported that patients are seen by the COPD nurse specialist as needed. This DHB also stated that education is provided, needs assessed and individual advice and follow up given, sometimes as part of Pulmonary rehabilitation but otherwise in individual sessions. DHB I mentioned providing the following services as part of case management:

- *'Phone calls, clinic visits, hospital visits, home visits and liaison with GPs. Respiratory nurse specialist as outreach from hospital but also "Mini MICH" programme and CCM generally provide case management approach.'*

Three DHBs that reported they did not operate case management for patients with COPD made further comments. One (G) stated that they provided case management on an informal basis as they did not have time or resources. DHB A stated that it has not tried to establish the service due the pressure of clinical commitments. Lastly, DHB B expressed that they could not support this service, and where necessary referred patients to PHO and other community services, case management being limited to multiply-co-morbid frequent flyers.

Demographic information

Only one DHB (H) provided demographic information of the patients that accessed the service in 2006. Most DHBs (small: C; medium: D, K; large: I, M, N) that indicated they had case management for COPD patients did not provide demographic data.

Referral for case management for COPD

Three DHBs responded to this question. One medium DHB (H) reported that their case management service was open to referral from both hospital physicians and primary care. One large DHB (I) reported that their case management was only open to referral from hospital physicians. One small DHB (C) reported that their case management was only open to referral from primary care. Four DHBs (D, K, M and N) did not provide information regarding their referral process.

Staffing levels

Only two DHBs indicated the staffing level for this service. DHB C reported they had 1 FTE in Clinical Nurse Specialist. They also had practice nurses (Care Plus) and district nurses for this service.

However, the DHB was unsure of their staffing level. DHB H stated they had 3.1 FTEs in nurse which is the same team as described for CHF patients.

Service elements

Three DHBs (C, H, I) described the service elements and their integration of their case management service. DHB C cited that the lead carer is identified through a Community Clinical meeting and patient held records in some instances assist with integrating components of care. DHB H reported that their case management included care plans, monitoring teaching self management and monitoring, co-ordinating care from hospital services (MDT approach), working as part of the wider team, e.g. (liaising with GPs, Care Plus). Lastly, DHB I indicated that their service included phone calls, clinic visits and hospital visits.

Funding for case management for COPD

All three DHBs (43%; C, H, I) that responded to this question received recurrent and guaranteed support for their case management service as part of overall funding for the respiratory department. The other DHBs did not respond.

Audit process and improvement programme for case-management for COPD

Only three of seven DHBs (38%; N, H and I) had an audit process or quality improvement programme for case-management for COPD. One DHB (14%; C) reported they did not have such processes/programmes. Four DHBs (D, F, K and M) did not respond.

L. Cultural Specific Programmes

Cultural specific programmes

Only two DHBs (small: C; medium: K) indicated that they had culturally specific programmes available at their DHB. The remainder of the DHBs did not.

Cultural support workers

Nine DHBs (60%; small: C, G; medium: F, L, K, H; large: I, A and E) reported they had cultural support workers to facilitate access and management of COPD patients, the other five DHBs (40%; medium: D, B; large: P, N and M) did not.

A DHB (C, small) who indicated that they had cultural support workers to facilitate access and management of COPD patients gave additional detail regarding their staff availability for this support: 1 FTE Disease State Management Nurse (however uncertain of the specific FTE for COPD); Whanau Ora staff; Korua and Kuia community support; GP Maori Outreach to support GP Marae clinics, specialist respiratory nurse Marae and Community House (Pacific Island People) clinics (FTE components for COPD not specified).

A medium size DHB (D) indicated that they did not have culturally specific programmes and support workers because there were partnership clinics held with some Maori and Iwi providers.

Another medium size DHB (F) reported that they were not granted funding for specific respiratory Maori and Pacific programmes due to their limited population size. However, they stated that they did have excellent Maori and Pacific support services.

A large DHB (N) explained that there was no need in the population under their care for culturally specific programmes. They further explained that they had close contact with Kaitiaki and their patients had been supportive of this approach. They also worked closely with local Iwi providers and their disease management nurses.

M. Equivalent initiative that do not entirely fit the descriptions of above services

Two DHBs (medium: F and L) indicated that they had no other equivalent initiatives. Eight did not respond (Q, C, G, H, M, N, P and I). However, five DHBs (medium: D, K, B; large: A and E) stated that they operated equivalent initiatives that did not fit the descriptions used in our questionnaires. The following are the responses categorised by DHB size.

Medium DHB:

- *Nurse Practitioner partnership clinics (outreach clinics on Marae or Iwi based clinics). This DHB (D) has respiratory services plan currently being rolled out, to include: 4 FTEs Community Based Physiotherapy; 6 FTEs Proficient Level Respiratory Nurses; 1 FTE Expert Nurse for Professional Development; 0.8FTE Nurse Practitioner. This DHB also had community sleep service; six community spirometry across the region; Community Pharmacy and Community Psychology service.*
- *One DHB (K) funded the Asthma Society to coordinate a COPD support programme. Education sessions run by respiratory physicians and clinical nurse specialist for primary providers. Provide an urgent assessment of compromised COPD patients referred by GPs and rest homes.*
- *Lifestyle Exercise maintenance classes and Nurse led clinics. (B)*

Large DHB:

- *GP Liaison: 5 + years ago- teaching spirometry in primary care. (A)*
- *Nurse educator for primary community and secondary care providers. Specialist advice for palliative care of people with COPD. (E)*

N. Initiatives DHBs tried to implement but were unsuccessful

Two DHBs (medium: L; large: A) reported they did not have initiatives that they tried implementing and were unsuccessful. Six DHBs (small: Q; medium: D, H; large: I, M, N) did not respond. Seven DHBs (small: C, G; medium: F, K, B; large: P and E) provided responses as follows:

Small DHB

- *COPD Pathway across primary health and secondary health continuum. This failed because they were unable to get agreement among hospital physicians about best practice protocols (some did not accept the guidelines). (C)*
- *Had established a community based support group for respiratory patients and there were barriers such as venue and funding. Lack of coordination of the group and this was left to respiratory nurse specialists. (G)*

Medium DHB

- *Community inpatient service to manage patient conditions during the winter period to prevent complications of their condition with the aim of preventing hospital admission. (K)*
- *Hospital at home; increased nursing support to practice nurses (education, one to one; primary health support; spirometry teaching). (B)*
- *Plan for next 12 months is to link in more formally with the Paediatrics and Respiratory consultants to support each other's*
- *work. Long term oxygen therapy requires evaluating and brought up to national standards. Palliative care of end stage COPD is not sufficient and requires reviewing. (F)*

Large DHB

- *COPD pathway implementation failed because the plan was not applied widely by the hospital medical staff. (P)*
- *Developing Pulmonary Rehabilitation in the Community. (E)*
- *Weekly assessment clinics for 'frequency flyers admissions''. (N)*

O. Initiatives DHBs would like to implement

Four DHBs did not respond (small: Q; medium: D; large: E and I). Ten DHBs (C, G, F, L, H, B, P, A, M and N) responded as follows:

Small DHBs:

- *A clear COPD continuum of care based on the COPD guidelines and committed to by all. (C)*
- *Spirometry annually to all people who smoke and are over 35 years (G)*
- *Annual COPD review (G)*
- *Inhaler technique (G)*
- *Vaccination(G)*
- *Weight(G)*
- *Exercise tolerance (G)*
- *Smoking cessation support (G)*
- *Annual physician clinics to all LTOT with COPD (G)*
- *Increased access to physiotherapy services (G)*
- *PHO support for community based pulmonary, support group (G)*
- *Identified pathways to access specialist support from a neighbouring large DHB (G)*

Medium DHB:

- *Linking in with the physiotherapy department more formally and looking into ways to use the hydrotherapy pool as part of exercise regime. Physiotherapy department has some fantastic concepts and programme information in these areas that need to be investigated further. (F).*
- *Recent funding initiative through community Asthma Society funding community education and intervention for people with COPD (L).*
- *The cardio-pulmonary department needs to expand to cope with growth - an issue is the current lack of outpatient clinic space availability. (H)*
- *The medical outreach service is a good model and should be expanded to; (a) expand criteria to accept less acute cases and (b) expand coverage outside of (main centre). However accepting more cases would also require an expansion of physician and multi-disciplinary team resources. (H)*
- *The long-term oxygen therapy is only 0.8 FTE and covers all of region. This is not sufficient to provide an adequate level of support to clients and other support staff providing care to the client. (H)*
- *DHB M respiratory service provides specialist care for people with sleep apnoea in region H. CPAP machines are available from M. There is no technician based in the local DHB. (H)*
- *Spirometry training/refresher courses would be useful. (H)*
- *Audit COPD practice, Hospital at Home, Increased respiratory Physician FTE, Increased education and support for Practice Nurses, Pneumovax for COPD patients, Improved support for patients in the community, Improved follow-up post discharge, Improved care for those with palliative care needs, Improving proactive care (e.g. spirometry screening smokers over 40 years), More Outreach clinics (and more staff), Increased support for GPs, Improved management and education for asthma. (B)*
- *Linking in with the physiotherapy department more formally and looking into ways to use the hydrotherapy pool as part of exercise regime. Physiotherapy department has some fantastic concepts and programme information in this area that need to be investigated further. (F)*

Large DHB:

- *Hospital at home programme, whereby COPD patients are managed within the community with support from secondary services. (P)*
- *We need a respiratory department with an adequate number of physicians either established or in training. (A)*
- *Need a respiratory function department with our own equipment and own staff (i.e. currently the DHB rents equipment and staff from a private company). (A)*
- *Increased number of respiratory nurses. (A)*
- *COPD care is fragmented between different providers and COPD is diagnosed late – clear need for spirometry to be more widely available but as providers of training programmes and recertification programmes we know that health providers (whether GPs or practice nurses) who do small numbers do not maintain skills and the provision of easily accessed service convenient to patients (the aim is to screen “healthy” smokers) requires new initiatives e.g. high quality spirometry via the community lab providers where volume of tests and easy, flexible availability will encourage patients to access this service at their GPs request. (M)*
- *Pulmonary rehabilitation has to be more easily available and accessible but it is more than just a gym and these patients are very limited so skilled staff essential. A number of models could be proposed but would need significant resourcing. Whether hospital at home is*

realistic or an early discharge the day following assessment (i.e. not formally admitted to hospital bed) with community based local COPD support network needs to be urgently explored as the number of increasingly elderly patients with COPD is increasing and will further burden our already stretched in patient resources. (M)

- *I would like to see the roll out of the community based pulmonary rehabilitation programmes throughout the region to increase access. However it must be staffed with appropriate skill level and resources.(N)*

P. Summary of evidence-based COPD service provision by DHB size

The table below summarises COPD service provision according to DHB size (those DHBs not providing a response are excluded).

Table 4: Summary of COPD service provision according to DHB size

	Small DHBs (%) positive response	Medium DHBs (%) positive response	Large DHBs (%) positive response
Audit Process/Quality Improvement for Patients admitted with COPD	0	33	50
Overall Leadership in COPD	33	50	67
Protocols/guidelines for COPD management	33	83	50
Spirometry	100	100	100
Audit or quality Improvement Programme for Spirometry	50	33	60
Pulmonary Rehabilitation	100	83	100
Ongoing home-based exercise programme	0	33	60
Ongoing (post-rehab) support	100	100	40
Other rehab community based service	0	100	40
Audit or quality Improvement Programme for Pulmonary Rehabilitation	50	67	100
LTOT Service	100	100	100
Service lead for LTOT (NB. large 'nil response' rate)	50	75	50
Written guidelines for LTOT	100	100	100
Audit or quality Improvement Programme for LTOT (NB. large 'nil response' rate)	50	0	75
Non-invasive ventilation (NIV) for stable COPD (NB. large 'nil response' rate)	0	0	60
NIV for COPD exacerbation (NB. large 'nil response' rate)	50	75	80
Hospital at home teams for COPD exacerbation	0	16	0
Smoking Cessation	100	100	100
Audit or quality Improvement Programme for smoking cessation (NB. large 'nil response' rate)	50	0	0
COPD Self management and education programme	67	67	50

Audit or quality improvement programme for COPD self management (NB. large 'nil response' rate)	0	0	100 (Only one respondent)
COPD Case management	33	67	50
Audit or quality improvement programme for COPD case management (NB. large 'nil response' rate)	0	100	100

Q. Discussion and comment

There was a series of positive findings from the COPD section of the disease-specific Stocktake.

- All our respondent DHBs offered a spirometry service and, encouragingly, this was commonly open to direct referral from primary care.
- Almost all offered a pulmonary rehabilitation (PR) service - again often open to referral from primary care. It was, however, surprising that even one (medium) DHB did not, and that only a minority appeared to offer any support after PR.
- All respondent DHBs offered LTOT assessment, though only six claimed to have a service lead for LTOT.
- All DHBs who responded had written guidelines for LTOT assessment and treatment, and in many cases the service was open to direct primary care referral.
- There was also full provision of smoking cessation services within DHBs, but unfortunately there was limited information on uptake and on referral processes (though in the latter case when information was provided, open access was the rule).
- There also appeared to be relatively good provision of palliative care support for COPD sufferers in the latter stages of their illness, with only two respondent DHBs indicating that such a service was *unavailable*.
- Although very few DHBs offered vaccination programmes to their COPD patients in the secondary care setting, with most relying on primary care providers, there is limited information (particularly in the New Zealand context) for us to comment on the relative efficacy, in terms of uptake, of different models of vaccination provision.

However, the results of the remainder (i.e. most) of the COPD section of the disease-specific Stocktake, once again, generally (with some exceptions cited below) make disappointing and indeed worrying reading, and accord both with: our recent Generic Stocktake report (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study] Report: Generic Stocktake Analysis, May 2009); and with the results of a survey by the New Zealand Branch of the Thoracic Society of Australia and New Zealand (TSANZ) conducted in 2006, in which provision was measured against agreed TSANZ standards [1]. The current report has highlighted the perceived lack of leadership and championship for COPD in many parts of the country, with only eight of 15 DHBs having a designated clinical leader in COPD and indeed only nine having a department of respiratory medicine. It is reasonable to suggest that the issue of leadership lies behind many of the other issues highlighted in the current report, particularly as leadership was spontaneously raised (in comment form) in DHBs' replies to other questions (e.g. hospital at home teams, vaccination services, initiatives tried and failed, initiatives DHBs would like to implement).

In common with most other aspects of both the current section of the Stocktake and with the generic Stocktake report (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study] Report: Generic Stocktake Analysis, May 2009), there is evidence of better provision in larger DHBs (though the opposite appears to be the case for some aspects of audit and for self management). There is a wide variability in service provision from different DHBs, which qualifies in our view, and in that of the TSANZ [1], for the description of a 'post code lottery'. This clearly speaks to inequalities in healthcare provision across the country, as does the fact that only two of our respondent DHBs offers a culture-specific programme for COPD and 40.40% of DHBs do not have cultural support workers in this area.

We were surprised to discover that six DHBs (40% of our respondents) claim not to use any form of endorsed guideline in the management of patients admitted with acute exacerbations of COPD (AECOPD). There was a tendency for DHB size to be a factor here also, though in this case medium sized DHBs had the highest guideline use. The lack of universal guideline application is particularly worrying given that (unsurprisingly compared to most international practice) most patients admitted with AECOPD are cared for on general medical wards rather than on specialist respiratory wards.

The relatively poor uptake of guidelines perhaps also partly explains the almost universal absence of nurse-led hospital at home teams for the care of selected patients who would otherwise be admitted with AECOPD. Only one of our 15 respondent DHBs operated such a service at the time of our Stocktake (though we are aware of another DHB which began operation of a service in 2008). Others commented that they would like to or have tried to implement this highly evidence-based (and guideline-recommended) addition to the care of their patients but have been prevented from doing so by resource and/or leadership issues. Similar comments may apply to the fact that only eight of our respondent DHBs offer non-invasive ventilation (NIV) in the context of AECOPD, despite evidence of the effectiveness of this intervention. This figure (perhaps paradoxically reassuringly) did represent 73% of the 11 respondents to this question (i.e. the remaining DHBs did not provide data in this area). Less reassuringly, only three (large) DHB, from eight respondents, offered NIV in stable COPD.

Another feature of concern in this section of the report is the limited use of audit or quality improvement programmes (for AECOPD admissions, spirometry, pulmonary rehabilitation, LTOT assessment, smoking cessation programmes, self management, and case management). This also accords with the 2006 TSANZ survey which showed that many DHBs did not audit their services, and only a minority measured them against KPIs [1]. Indeed, some of the responses suggested that the concept of continuous quality improvement and clinical indicators was misunderstood. This accords with the general impression of a lack of adequate evaluation of clinical services and is yet more evidence, in conjunction with similar findings for our other index conditions in the present report, of a missed opportunity to identify and address local deficiencies in care. It also calls into question the reliability of self reporting by DHBs to the Ministry of Health on quality of service provision.

The cornerstone of chronic conditions management, self-management and education, appeared only to be provided in the context of COPD by 60% of our respondent DHBs, with the remainder specifically stating they did not offer this. One DHB (in its written comments) argued that the evidence base for self management in COPD (as opposed to in asthma, for example) is poor. Whilst this is true of self management when used in isolation in COPD, there is evidence that when offered as part of a package of other CCM pillars or dimensions, self-management has a place in COPD (ABCCNZ Literature Review, 2007).

Approximately half of respondent DHBs did not operate case management for COPD, with lack of resource being cited by all that commented further. We are aware that since the Stocktake, another DHB has begun operation of a limited case management service for its COPD patients, and we suggest that the establishment of case management services should be prioritised in the remainder of respondent DHBs where no such service exists. Indeed, in this and other areas, the lack of services does not appear to result from a lack of knowledge within DHBs about what needs to be done. In response to the questions around initiatives DHBs would like to implement, and around initiatives they had previously tried and failed, there was evidence of an excellent knowledge base which was, however, confronted with the barriers of limited leadership, and lack of financial and staff resource. We would also argue that both in the current section of the Stocktake, and in our recent generic Stocktake report, there is evidence that difficulties around knowledge transfer and, most importantly, decision support may be contributing to a 'development void'. In the disease-specific Stocktake (in the COPD subsection and in other disease specific areas) we had a good response rate

to our basic level questionnaire concerning the existence or otherwise of services; but of the DHBs responding at this level, only approximately 50% were able to provide basic demographic information on, for example, service use.

In summary, though there are some areas of COPD provision which are well implemented in the New Zealand public health system, there is patchy availability of many aspects of care necessary for a comprehensive service. There appears to be structural barriers of resource, leadership and information flow which militate against development.

References

1. Garrett J, Chen B, Taylor RD. A survey of Respiratory services in New Zealand undertaken by the Thoracic Society of Australia and New Zealand [TSANZ]. *The New Zealand Medical Journal*, 13 February 2009, Vol. 122, No. 1289.

Chapter 6: Stroke Analysis

The Stroke questionnaire was completed by 14 DHBs¹³. The DHBs were clustered by size for ease of analysis¹⁴. Overall, there were three groups consisting of three small (C, G, Q), six medium (B, D, L, K, H, F) and five large DHBs (E, I, A, M, N). This breakdown is in accordance with the MoH breakdown by population. The following section describes the analysis of the questionnaire. The analysis considers an overview of people with stroke, patient demographics and services provided.

DHB size	DHB code
Small	C, G, Q
Medium	B, D, L, K, H, F
Large	E, I, A, M, N
Total	14

There was an average of 366 patients with stroke admitted as inpatients to 13 DHBs in 2006. One large DHB (N) did not respond to this question. Large DHBs had a higher number of inpatients (mean= 809 patients, range 592 to 1313 patients) than medium DHBs (mean= 209 patients, from 120 to 256 patients) and small DHBs (87 patients, range 50 to 125 patients).

A: Demographic information

The following is a summary of patient demographics of all DHBs. Overall, more males (51%¹⁵, range 40% to 69%) than females (50%, range 31% to 61%) accessed a stroke service in 2006. Of these patients, the majority were NZ European (78%, range 60% to 97%), 7% (range 1.1% to 22%) were Maori, 4.5% (range 0% to 20%) were Pacific and 1.9% (range 0% to 6%) were Asian and 9% (range 0% to 24%) of patients were from other ethnicities. The mean age of patients was 75 years for NZ European, 71 years for patients from other ethnicities, 67 years for Asian, 64 years for Maori, and 62 years for Pacific patients. One large DHB (N) did not respond.

Audit process or quality improvement programme

Nine of 14 DHBs (64%; small: Q; medium: D, L, H, F; and large: E, I, A, M) reported they had an audit process or quality improvement programme for the management of patients admitted with stroke. Five (36%; small: G, C; medium: B, K; large: N) DHBs reported that they did not have such a programme in place.

¹³ DHBs that are included in this analysis are: C,G,Q,B,D,L,K,H,F,E,I,A,N and M

¹⁴ DHBs were categorised into small, medium and large DHB by the total population served by each DHB, however, DHB P is classified as a large DHB given its Tertiary service status. The MoH used the same classification for the 'DHB hospital Benchmark information report (March 2008)'.

¹⁵ This percentage represents the mean of the 13 percentages of male patients admitted in the service of the 13 DHBs.

Additional comments

One of the DHBs (G) that reported they did not have such audit processes or quality improvement programmes said that they had completed one stroke audit using the RCP (UK) audit tool five years ago, but did not have an annual audit process. They also indicated that they were awaiting the NZ Stroke Foundation audit tool.

The nine DHBs that had audit processes or quality improvement programmes reported that they used the following method or tools as clinical indicators:

- *Stroke pathway (Q)*
- *Stroke severity on admission against discharge (D)*
- *Stroke registry- ongoing rolling audit every three months clinical indicators – KPIs (A)*
- *Adequacy of implementation of secondary prevention (D; M)*
- *Royal College of Physicians Audit Tool (L; E)*
- *RCP Scottish Collegiate KPIs (I)*
- *Australian version of the Royal College of Physicians audit system with multiple clinical indicators from numbers treated with tPA to those with imaging, percentage and how long to be seen by allied health staff. (M)*
- *Clinical-based parameters from the NZ stroke guidelines – length of time to be seen, investigations complete, discharge etc. (F)*
- *CT within 24 hours (H)*

B: Staffing

Overall leadership

Twelve DHBs (86% of 14; small: Q, G; medium: B, D, L, K, H, F; large: E, I, A, M) reported they had an individual with overall leadership in stroke and two DHBs (small: C; large: N) indicated that they did not.

Eight of the DHBs that had an individual with overall leadership made additional comments. A small DHB (G) stated that leadership is provided by a physician/geriatrician. Within medium DHBs, DHB B reported that they had recently appointed a stroke clinician. DHB F identified a need for a stroke nurse leader, as their clinician leader had insufficient time. DHB H stated that leadership is provided by a lead clinician, and DHB D stated that leadership is provided by a neurologist. Within large DHBs, DHB I named one stroke champion and another stroke physician and geriatrician as being leaders within stroke. DHB A reported that two leaders supported stroke, with one sitting in acute stroke and one sitting within stroke rehab. Lastly, DHB M reported that a stroke neurologist lead the department.

C. Stroke/ TIA Outpatient Clinic

DHBs were asked if they offered a specific outpatient service for new referral of patients with suspected stroke or TIA. Seven of the 14 DHBs (medium: B, D, L, F; large: I, A, N) reported they did and seven (small: C, G, Q; medium: H, K; and large: E, M) reported they did not.

Demographic information

Of the seven DHBs with a specific outpatient service for new referral of patients with suspected stroke or TIA, none provided demographics of the patients that accessed the service within 2006.

Current waiting time for this service

Five DHBs (A, I, H, L, D) reported their approximate waiting time for this service. One medium DHB (H) reported they had a weekly stroke clinic which ceased with staff resignation and were about to start a same-day TIA service. The shortest *current* waiting time was five days. For large DHBs the range was seven to 35 days, and for medium DHBs the range was five to 28 days.

D. Intravenous Thrombolysis for Stroke

Eight DHBs (medium: H, K, L; large: A, E, I, M, N) reported having a protocol for the use of intravenous thrombolysis (tPA) as a routine management for suitable patients with acute ischaemic stroke. DHB A specified that its protocol was evidence-based. No small DHBs offered this service.

There were approximately nine patients treated with tPA per large DHB in 2006. Two medium DHBs reported that they had three (H) and zero (L) patients, respectively. One medium DHB (K) did not respond.

The other six DHBs (43% of 14; small: C, G, Q; medium: B, D, F) reported that they did not have a protocol for the use of intravenous thrombolysis as a routine management for suitable patients with acute ischaemic stroke. The three medium DHBs that did not offer this service made the following comments:

- Two DHBs have not tried to establish this service. (B; F)
- One DHB was in the process of trying to implement this service. The main obstacles identified by this DHB were: other physicians who do not believe in the utility of tPA; no prior local experience; no after-hours radiology/ CT; only one neurologist to cover call. (D)

E. Inpatient Acute Stroke Unit

Six of 14 (43%; medium: D, H, K; large: E, I, M) have a designated area for managing patients with stroke in the acute first four to seven days of their hospitalisation.

A large DHB (I) that provided this service specified that GPs can't directly admit patients, but they can access advice direct from a stroke physician/registrar. This DHB also added that all admissions currently must go through triage in EC and can be seen directly by the Stroke Registrar. Another large DHB (M) that provided this service stated that they have a 12-bed acute stroke unit within the neurology department.

The other eight DHBs (small: C, G, Q; medium: B, L, F; large: A, N) indicated that they did not have such a service, five of which provided the following comments:

- A small DHB (G) indicated that this has not been addressed by management, although this matter had been brought to the notice of management by the clinical team several times. The 2020 plan for this DHB addresses this issue.

- One medium DHB (B) reported that they are planning an inpatient acute stroke unit and aim to start in June 2008. Another medium DHB (L) indicated that all patients are admitted to general medical ward(s). The third medium DHB (F) stated that patients with acute stroke are admitted to acute medical ward(s) and that they had plans in place to attempt to establish stroke rooms within that unit.
- A large DHB (A) commented that they tried to establish this service but encountered difficulties when convincing management of the evidence base and/or priority of need.

The six DHBs that had an area designated for the management of stroke patients in the first four to seven days of their hospital admission were asked to complete a second, more detailed questionnaire:

Primary Care Admission Rights

Four DHBs (medium: D; large: E, I, M) reported their primary care physicians could not admit patients directly to this unit, while primary care physicians of one medium DHB (H) did have admission rights. One DHB (K) did not respond.

Location and usage of designated area for acute stroke

The six DHBs were asked about the location of the designated area for the management of acute stroke patients, along with the percentage of patients admitted to this unit. The percentage of acute stroke patients admitted to the designated acute stroke unit ranged from 40% to 75% (mean 60%), and the percentage of their acute hospital stay that they spent on the unit ranged from 50% to 100% (mean 80%). The delay in admission to the unit ranged from zero to up to 36 hours (with four of five responding DHBs mentioning occasional lack of bed availability as a reason for delay).

Two units (D, I) were located on general medical wards, one on a neurology ward (M), and two DHBs had a separate dedicated unit (H, E). One (K) of the six DHBs did not respond.

Patients accessing the service in 2006

Two large DHBs (E and I) reported that 655 and 350 respectively patients accessed the service in 2006. Three DHBs (D, H, and M) were unable to answer because their service began operation in 2007, while one DHB (K) did not respond.

Demographic information

Only DHBs E and I were able to provide demographic information of their patients that accessed the service in 2006. On average, across these two DHBs, 51% of patients were male and 50% were females¹⁶. In terms of ethnicity, the majority of patients were NZ European (66%), followed by patients from other ethnicity (17%), Maori (6%) and Pacific (6%). One DHB (E) reported one percent of their patients as being Asian. In terms of the mean age of these patients, only one DHB (E) provided details. For this DHB (E), NZ Europeans were on average 78 years, 'other ethnicity' patients 76 years, Asians 64 years, Maori 62 years and Pacific patients 62 years.

¹⁶ This percentage represents the mean of the two percentages of patients admitted in the service of the two DHBs.

Funding for Inpatient Acute Stroke Unit

The majority of DHBs (medium: H; large: E, I, M) received recurrent and guaranteed funding for their Inpatient Acute Stroke Unit, only one medium DHB (D) reporting limited time project support. One medium DHB (K) did not respond.

Staffing levels

The six DHBs were asked to provide staffing levels (FTE in stroke rehabilitation) in the acute stroke unit. The DHBs were required to provide only the FTE of staffing levels in stroke only. However, a few DHBs included the FTEs for other areas. In terms of the medium DHBs: DHB D reported 0.2 FTE of inpatient management; 0.2 FTE of non inpatient management; 0.9 FTE nurse specialist or equivalent; 0.5 FTE Physiotherapist; 0.5 FTE Occupational Therapy Specialist; and 0.5 FTE Speech language therapist. DHB H reported 4 FTEs Inpatient management who rotate across other areas; 0.6 FTE Physiotherapist; 0.5 FTE Occupational Therapy Specialist; they currently have 1 FTE Speech language therapist and 1 FTE dietician for all of their hospital, 0.2 FTE administration, and 4.2 FTEs spread across nurses, social worker, and a clinical nurse manager for their acute stroke unit. DHB K did not respond.

For large DHBs, DHB E had 2 FTEs of Physicians with a specific interest in Stroke; 1 FTE nurse specialist or equivalent; 2 FTEs Physiotherapist; 0.2 FTE Occupational Therapy Specialist; 0.4 Dietician and 0.5 FTE social worker. DHB I reported a 0.3 FTE of inpatient management and 0.1 FTE of non inpatient management (e.g. Stroke clinic). DHB M reported 0.6 FTE of inpatient management; 0.3 FTE of non inpatient management (e.g. Stroke clinic); 1 FTE nurse specialist or equivalent; 2 FTEs of research nurse and 0.1 FTE administration.

F. Inpatient Stroke Rehabilitation for Patients <65 Years

There were on average 15 patients (range 3 to 35) below 65 years old requiring inpatient stroke rehabilitation amongst the three small DHBs (C, F, G) in the year 2006. Only four of six (B, D, H, F) medium DHBs responded to this question. Overall, there were approximately 29 patients (range 1 to 49) below 65 years old requiring inpatient stroke rehabilitation amongst these medium DHBs. For the large DHBs, one DHB (N) did not respond, and there were approximately 165 patients (range 36 to 225) below 65 years old requiring inpatient stroke rehabilitation amongst the other four large DHBs (E, I, A, M) in 2006.

Demographic information

Twelve DHBs (86%; small: C, F, G; medium: B, D, H, F; Large: E, I, A, M) provided demographic information of the patients that accessed the service in 2006. The aggregated data revealed that more males (53%; range 0% to 78%) than females (47%; range 22% to 100%) below 65 years that accessed inpatients stroke rehabilitation. Approximately 62% of patients were NZ European, 22% were Maori, 7% were Pacific, 2.8% were Asian, and 12% were from 'other ethnicity'. The mean age of these patients when they accessed the service was 55 years for NZ European and Pacific patients, 53 years for Asian and for 'other ethnicity' patients, and 50 years for Maori.

Medical specialist(s) responsible for inpatient stroke rehabilitation for patients <65

Thirteen DHBs responded to this section. For the three small DHBs (C, G, F) it was a General Physician who was usually responsible for inpatient stroke rehabilitation. Two of the six medium DHBs reported that a rehabilitation specialist was responsible (D and B); two cited a Geriatrician (L and K); one (F) cited a general physician, and one DHB (H) reported both a geriatrician and a general physician would usually be responsible. For large DHBs, one (N) did not respond and two (E and M) cited a rehabilitation specialist. Another large DHB cited a combination of a general physician and a rehabilitation specialist (A); and one DHB (I) cited a combination of a geriatrician, a neurologist, a rehabilitation specialist and a stroke physician.

Rehabilitation facility or service for treatment of younger patients

Nine respondent DHBs (64%; small: Q, G; medium: B, D, H, F, L, K; large: A) did not have a specific rehabilitation facility or service for younger patients (< 65 years) with stroke. However, DHB G explained their patients were rehabilitated in the older persons' facility with general geriatrics patients. The stroke rehabilitation of DHB D was done as part of the rehabilitation facility and it was reported that they were trying to establish separate units; however, funding, staffing and facility limitations were reported as obstacles for this development. DHB K reported that their patients were managed in general geriatrics rehabilitation unit. DHB A reported that it was in the process of getting a facility for treatment of younger patients, and that currently these patients are transferred to a regional facility. Lastly, two DHBs (B and H) commented that their rehabilitation facility is not age specific.

Four (small: C; and large: E, I, M) DHBs reported that they did have such a facility/service. One large DHB (N) did not respond. Of those DHBs that said they did have a rehabilitation facility/service for younger stroke patients, only one DHB (I) indicated that their primary care physicians can admit patients directly to this unit, while DHBs C and M stated they could not, and DHB E did not respond.

G. Inpatient Stroke Rehabilitation for Patients ≥65 years

There was an average of 56 patients (range 37 to 90) over 65 years (inclusive) requiring inpatient stroke rehabilitation amongst the three small DHBs in 2006. Only four of six medium DHBs (B, D, H, F) responded to this question. Overall, these DHBs reported 102 (range 55 to 139) such patients. Three DHBs (K, L, and N) did not respond. There were 516 patients (range 174 to 1106) over 65 years requiring inpatient stroke rehabilitation amongst the responding four large DHBs (E, I, A, M).

Demographic information

In total, twelve DHBs (86% of 14) provided demographic information of the patients that accessed the service in 2006. Two (medium: K; and large: N) did not provide demographic data. The aggregated data revealed that there were similar percentages of female (50%, range 27% to 64%) and male (50%; range 36% to 73%) patients 65 years or above that accessed inpatient stroke rehabilitation. Overall, 82% were NZ European (range 67% to 97%), 5% were Maori (0% to 22%), 4.2% were Pacific (range 0% to 21%), 1.4% of patients were Asian (0% to 4%) and 8% were from

other ethnicities (range 0 to 25%). The mean ages¹⁷ were 79 years for NZ European (range 72 to 82), 77 years for Asian (range 72 to 87), 74 years for Maori (range 67 to 90), 72 years for Pacific patients (range 68 to 77) and 78 years for patients of other ethnicity (range 75 to 83).

Medical specialist(s) responsible for inpatient stroke rehabilitation of patients ≥ 65

In the three small DHBs (C, G, F) it was general physicians who were usually responsible for inpatients' stroke rehabilitation. All six medium DHBs (B, D, H, F, K, L) reported it was the geriatrician who would usually be responsible for inpatient stroke rehabilitation for patients ≥ 65 years. Of the five large DHBs one (N) did not respond. The remaining four all had different medical specialist teams which were usually responsible for inpatient stroke rehabilitation [general physician; geriatrician and rehabilitation specialist (E); general physician, geriatrician, rehabilitation specialist and neurologist (I); general physician, geriatrician and stroke physician (A), and geriatrician (M)].

Designated area for inpatient stroke rehabilitation for patients ≥ 65 years

Four of 14 DHBs (29%; medium: K; large: E, I, A) had a designated area for inpatient stroke rehabilitation for patients aged 65 years and over. Nine DHBs (64%; small: C, G, Q; medium: B, D, L, H, F; large: M) indicated that they did not have such a designated area. One large DHB (N) did not respond. Two of the DHBs (I and A) with a designated area reported that their primary care physicians can admit patients directly to this unit. One (E) said that primary care physicians can only admit these patients with the approval of a specialist. The fourth DHB (K) failed to respond.

DHBs with no designated area for stroke rehabilitation

Of the nine DHBs that did not have a designated area for inpatient stroke rehabilitation, two small DHBs (G and Q) reported that such rehabilitation takes place on general geriatrics and assessment, treatment and rehabilitation (A,T & R) wards, and one small DHB (C) cited general medical ward(s). For medium DHBs, three (B, H, F) reported they provide stroke rehabilitation on a general rehabilitation unit (i.e. not stroke-specific) and two (D, L) provide rehabilitation on general geriatrics and A, T & R wards. Lastly, DHB M provided rehabilitation for stroke patients on a non-stroke specific rehabilitation unit.

DHBs with a designated area for stroke rehabilitation

The four DHBs that have a designated area for stroke rehabilitation were asked where the designated area is located. Two large DHBs (A and I) reported that the designated area is in a general rehabilitation ward, one (E) indicated that it is in a stroke rehabilitation unit (exclusively used for rehabilitation of stroke patients) and one medium DHB (K) did not respond. The percentage of all stroke patients admitted to these designated areas (within DHBs A, I, and E) ranged from 25% to 75% (mean 50%). However, the percentage of stroke patients requiring rehabilitation admitted to these units ranged from 25% to 95% (mean 65%). The duration of hospital admission prior to transfer to the unit ranged from three to seven days.

Funding for Inpatient Stroke Rehabilitation

All DHBs (A, E, I) who responded received recurrent and guaranteed funding for their inpatient stroke rehabilitation unit. One medium (K) DHB did not respond.

¹⁷ We have doubts regarding the accuracy of this data, as the lower limits of the age ranges provided do not appear consistent with services provided for those aged over 65 years.

Multidisciplinary team (MDT) expert in stroke

All DHBs were asked if patients requiring inpatient rehabilitation were routinely seen and treated by a multidisciplinary team (MDT) expert in stroke¹⁸. Seven (small: G; medium: F, H, K; large: E, I, M) of the 14 DHBs reported their stroke patients are routinely seen and treated by a MDT expert in stroke. One DHB (F) commented that there is no specific stroke rehabilitation unit but that there is individualised stroke care with multidisciplinary input. This DHB also stated that it was in the process of establishing a stroke room within the unit. DHB M stated that stroke patients greater than 65 years are concentrated within a single general rehabilitation ward so that stroke expertise is concentrated within one ward.

Six DHBs (small: C, Q; medium: B, D, L; large: A) reported they did not have a MDT for stroke patients, and a large DHB (N) did not respond. One of these DHBs (B) explained that their team has to work with a variety of diagnoses and are not stroke experts.

The seven DHBs that have MDT expert in stroke for their inpatient rehabilitation were further asked about the proportion of clinical time the MDT spend exclusively treating patients with stroke. One small DHB (G) stated that they were unable to estimate this. One medium DHB (K) did not respond. One medium DHB (F) estimated it was 25%, three DHBs (medium: H; large: I, M) reported approximately 50% and one large DHB (E) estimated 100% of the MDT clinical time was spent exclusively treating patients with stroke.

Staffing levels of the team

The seven DHBs were asked to indicate staffing levels (FTE in stroke rehabilitation) of the members of the MDT. The small DHB (G) did not respond to this question. Of the medium DHBs, DHB K did not respond. DHB H reported their MDT consists of four physicians with special interest in stroke, although the DHB specified that these physicians rotate and work other areas; 0.5 FTE for each of physiotherapist and occupational therapist; 1 FTE for each of speech language therapist, social worker and administrator; 4.2 FTEs of other staff along with a shared dietician. DHB F cited that their MDT has 0.25 FTE physician with special interest in stroke; 0.5 FTE for each of physiotherapy, speech language therapist and social worker; 0.3 FTE occupational therapist and 0.2 FTE dietician.

For large DHBs: DHB E had 1 FTE physician with special interest in stroke; 15.2 FTEs of registered nurses; 5.6 FTEs of enrolled nurses; 3 FTEs of physiotherapist (with 0.7 FTE assistant); 3 FTEs of occupational therapist (with 0.4 assistant); 1.4 FTEs of speech therapist; 0.7 FTE of dietician; 1.5 FTEs of social workers; 1 FTE administrator; 1 FTE charge nurse manager and 2.3 FTEs of hospital aids. DHB I reported their MDT had 0.3 FTE physician with special interest in stroke. DHB A reported their team had 0.5 FTE physician with special interest in stroke; 0.1 FTE nurse specialist; 0.2 FTE research nurse; 1 FTE physiotherapist; 0.5 FTE for each of occupational therapist, speech language therapist, dietician, administrative, and other staff and 0.3 FTE social worker. DHB M reported that they could not provide FTE detail.

Components of Inpatient Stroke Rehabilitation

DHBs were asked if their inpatient stroke rehabilitation service routinely have or use multidisciplinary discharge summaries, 2^o prevention plans for individual patients, regular education

¹⁸ MDT expert in Stroke - defined as at least 3 professionals expert in stroke care – ABCC NZ Literature Review, 2007

sessions for staff, regular education sessions for patients and families and written information for patients and families. In the table below is a summary of DHBs' responses.

Table 5: Respondent DHBs provision of discharge summaries; and post-discharge information and service.

	DHB	Multidisciplinary discharge summaries	Written 2 ^o prevention plans for individual patients	Regular education sessions for staff	Regular education sessions for patients and families	Written information for patients and families
Small	DHB Q			√		√
	DHB G	√				√
	DHB C					√
Medium	DHB B	Nil Response				
	DHB D	Not applicable				
	DHB L					√
	DHB K	Nil Response				
	DHBH	√		√	√	√
	DHB F			√	√	√
Large	DHB E	√	√ (60%)	√	√	√
	DHB I			√	√	√
	DHB A	√	√		√	√
	DHB N	Nil Response				
	DHB M		√	√		√
Total (maximum 14)		4	3	6	5	10

Three DHBs (B, K, N) did not respond. Another (D) reported that this section was not applicable because they do not have a dedicated stroke rehabilitation service.

Other services provided by inpatient stroke rehabilitation service

Each DHB was asked if their inpatient stroke rehabilitation service offered a driving assessment service and a vocational retraining scheme. Responses are summarised in the table below.

Table 6: DHBs response on their provision of driving assessment service and vocational retaining scheme.

	DHB	Driving Assessment service	Is this free for patients?	Vocational retraining scheme
Small	DHB Q	√	√	
	DHB G	√	√	
	DHB C	√	√	
Medium	DHB B	Nil response		
	DHB D	Not applicable		
	DHB L	√		
	DHB K	Nil response		
	DHBH	√	√	
	DHB F	√		
Large	DHB E	√	√	√
	DHB I	√		
	DHB A	√		
	DHB N	Nil response		
	DHB M	√		
Total (maximum 14)		10	5	1

DHBs classified by size: Small: C, G, Q, Medium: B, D, L, K, H, F, Large: E, A, I, M and N

Comment

One small DHB (C) that offered driving assessment services mentioned that this service was free for patients that met criteria. A medium DHB (D) that consistently replied 'not applicable' to most of the questions in section G made the following comment:

- *"We do have an acute stroke MDT meeting with stroke team with participation of >65 yrs rehab staff. Rehab has own MDT meeting but their MDT is not stroke specific. Staff funding is the main issue"*

H. Outpatient Rehabilitation

Early discharge programme

In regards to stroke rehabilitation services, four DHBs [29% of 14; small: G; medium: H; large: N, M] provided or had access to supported early discharge programme (stroke specific). The other ten DHBs [71%; small: C, Q; medium: B, D, L, K, F; large: E, I, A] did not provide or have access to such a programme.

Comments

Some DHBs provided additional comments regarding this aspect of outpatient rehabilitation. One large and five medium DHBs commented, of which five DHBs did not provide or have access to a supported (stroke specific) early discharge programme and one DHB did. The comments were as follows:

Did not provide or have access:

It appeared that lack of resources and workforce are issues relating to the provision/availability of stroke specific early discharge programme. Comments were specifically:

- *We are working on it. Outpatient PT/ OT staffing shortage is the main problem. (D)*
- *Lack of therapy resources. (K)*
- *There is a need to increase allied health support for this service. (F)*
- *Have not tried to establish this. (B)*
- *In the process of being developed. (E)*

Did provide or have access

One DHB (H) explained their discharge planning in detail:

- *Discharge planning is carried out by the community assessment and rehabilitation service (CARS team) which includes the needs assessment service and a community rehabilitation MDT.*

In addition to the above, a large DHB (I) that did not provide or have access to supported stroke specific early discharge programme gave the following comment:

- *Use of POAC to enable further brief convalescence/ rehabilitation within a residential facility. Step down not specific to CVA.*

Utility rate

The four DHBs that provided or had access to supported early discharge programmes were asked the percentage of all stroke patients who have received supported early discharge. Only one medium DHB (H) reported 100% of the stroke patients had received supported early discharge. The remaining three DHBs (G, N, M) did not provide the data.

Secondly, these DHBs were asked the percentage of stroke patients who required inpatient rehabilitation and had access to supported early discharge. A medium (H) and large DHB (N) respectively reported 100% and 75%. A small (G) and a large DHB (M) did not provide this data.

Usual time from date of admission to 'admission' to early discharge programme

Three of the four (G, M, N) DHBs were unable to respond when asked the usual time from the date of (acute) hospital admission to supported early discharge. One DHB (H) reported a mean time of 5.5 days.

Funding for early discharge programme

Three of four DHBs (G, H, M) indicated they receive recurrent funding. One DHB (N) did not respond.

Day Hospital Rehabilitation

Only four of 14 DHBs [29%; small: G; medium: F; large: E, I] provided or had access to Day Hospital rehabilitation within their stroke service. DHB G explained, however, that there were limitations to this service due to beds available.

Comments

Six DHBs (small: C; medium: B, D, H, K; large: A) that indicated their DHB did not provide Day Hospital rehabilitation commented on their reasons for not having this service. It appears that some DHBs had previously provided Day Hospital rehabilitation – one DHB (B) stated that it used to have a day hospital but closed it and another DHB (C) explained it had ended this service due to a lack of allied health staff. Another DHB (K) reported not seeing value in having Day Hospital rehabilitation, and one DHB (D) provided a similar service (not stroke specific). DHB A stated that it ended this service six or seven years ago due to a decision that stroke rehab is best accomplished at home rather than in day hospital. Similarly, one DHB (H) reported that instead of a Day Hospital service they provide community based rehabilitation.

Utility rate

Two of the four DHBs (F, E) providing day hospital rehabilitation for stroke both reported less than 25% of all their stroke patients have access to this service. DHBs G and I did not provide this data.

In addition, the four DHBs were asked the percentage of stroke patients requiring inpatient rehabilitation having access to Day Hospital Rehabilitation. A medium DHB (F) reported that less than 25% of such patients have access to Day Hospital rehabilitation, whereas it was 95% for a large DHB (E). The other two DHBs (G and I) did not provide this data.

Usual time from date of admission to Day Hospital rehabilitation

DHBs were asked from the date of (acute) hospital admission the usual time for a patient to access Day Hospital rehabilitation. Two DHBs responded, one (F) reported that the patients will have Day Hospital rehabilitation immediately post-discharge. For the other DHB (E), the time between discharge and Day Hospital was reported as being between three to four weeks.

Funding for Day Hospital rehabilitation

The two DHBs (E and F) which responded to the all questions in the section reported they receive recurrent and guaranteed support for their Day Hospital rehabilitation. The other two DHBs (G and I) did not respond.

Direct Referral from Primary Care Physicians

Three of four DHBs (G, E, F) indicated that primary care physicians can refer patients directly to this service. One DHB (I) did not respond.

Outpatient Rehabilitation

Eight of 14 DHBs (57%; small: C; medium: B, K, F; large: I, A, N, M) indicated that their DHB provides or has access to outpatient rehabilitation within their stroke service. Six DHBs (43%; small: G, Q; medium: D, L, H; large: E) reported their DHB did not provide or have access to such a service. The eight DHBs providing outpatient clinic rehabilitation were asked to complete further questions regarding service provision.

Utility rate

Two DHBs (small: C; large: I) reported that less than 25% of all their stroke patients access outpatient clinic rehabilitation. One medium (F) and two large DHBs (A, N) respectively reported that 100%, 75%, and 25% of all their stroke patients have outpatient clinic rehabilitation. Three DHBs (B, M and K) did not provide this data.

DHBs were asked what percentage of stroke patients who required inpatient rehabilitation received outpatient rehabilitation. Four DHBs responded (C, F, A, N), of which one small DHB (C) reported a figure of 25% or less. One medium DHB (F) reported a figure of 100%. Among large DHBs, DHB A reported 75% and DHB N reported 25%. Four DHBs (B, I, M and K) did not provide this data.

Usual time from date of admission to Outpatient Rehabilitation

DHBs were asked the usual time from the date of (acute) hospital admission to the start of outpatient clinic rehabilitation. The time reported by DHBs varied considerably. A small DHB (C) could not quantify a time period as 'time-lag varies according to condition progress and level of disability'. A medium (F) and a large (A) DHB respectively reported a period of four months and two to eight weeks. Five DHBs (medium: B, K; large: I, N, M) did not provide this data.

Funding for Day Hospital rehabilitation

Five DHBs (small: C; medium: F; large: I, A, M) reported they received recurrent and guaranteed support for their day hospital rehabilitation. The other three DHBs did not respond (B, K and N).

Direct Referral from Primary Care Physicians

Five of eight DHBs (C, F, I, A, M, N) indicated that primary care physicians can refer patients directly to this service. Two DHBs did not respond (B and K).

Community or Home Based Rehabilitation

Eleven DHBs (79% of 14; small: C, G; medium: B, K, H, F; large: E, I, A, M, N) indicated that their DHB provides or has access to community or home-based rehabilitation at their stroke rehabilitation service. Three DHBs [21%; small: Q; medium: D, L) reported their DHB did not provide or have access to such a service. DHBs that provide community or home-based rehabilitation were asked to answer further questions around service provision.

Utility rate

Five DHBs (small: C; medium: F; large: E, I, N) reported that less than 25% of all their stroke patients have access to community or home based rehabilitation. One DHB (A) reported approximately 50% of all their stroke patients have community or home-based rehabilitation. Five DHBs (G, B, K, H, M) did not provide this data.

In terms of the percentage of stroke patients who required inpatient rehabilitation and who subsequently received community or home-based rehabilitation; four DHBs (small: C; medium: F; large: I, N) reported less than 25%, two large DHBs (E and A) reported 50% and one medium DHB (H) reported 100%. Four DHBs (G, B, K, M) did not provide this data.

Funding for Community or Home Based rehabilitation

Six DHBs (small: C; medium: H, F; large: I, A, M) reported they received recurrent and guaranteed support for their community or home-based rehabilitation. The other DHBs (small: G; medium: B, K; large: N, E) did not respond.

Direct Referral from Primary Care Physicians

Eight of 11 DHBs (small: C, G; medium: H, F; large: I, A, N, M) indicated that primary care physicians can refer patients directly to this service while four medium DHBs (B, D, K, E) did not respond.

I. Audit

DHBs were asked if their inpatient stroke rehabilitation service routinely collected information on patients treated and/or their outcomes. The questionnaire specially asked if they had used stroke register, discharge destination, discharge ADL and other indicators. Overall, the most commonly used audit indicator was discharge destination (ten DHBs), followed by discharge ADL (eight DHBs), stroke register (five DHBs) and 'other' (one DHB).

Four DHBs (29% of 14) did not indicate use of any of the listed audit indicators, two reported using discharge destination as a means of audit, and three stated they have been using two audit indicators, discharge destination and ADL. Four DHBs (29%) used all three of the listed audit indicators. One DHB (7.1%) indicated that in addition to the three listed audit processes, they used discharge functional scores; medications; and education. Responses are summarised in Table 3.

Table 7: DHBs' responses regarding information collection on patients treated and/or their outcomes.

	DHB	Stroke register	Discharge Destination	Discharge ADL	Other	Total
Small	DHB Q	√	√	√		3
	DHB G					0
	DHB C		√			1
Medium	DHB B					0
	DHB D		√			1
	DHB L		√	√		2
	DHB K					0
	DHB H	√	√	√		3
	DHB F		√	√		2
Large	DHB E	√	√	√		3
	DHB I					0
	DHB A	√	√	√		3
	DHB N		√	√		2
	DHB M	√	√	√	Yes (Discharge functional scores; medications; education)	4
Total		5	10	8	1	

Routine audit for stroke service: At patient level

Seven DHBs (50% of 14; small: Q; medium: D; large: E, I, A, N, M) reported they routinely audit the stroke service provided at the patient level and seven (small: C, G; medium: B, L, K, H, F) indicated that they did not. The former seven DHBs were asked the audit tools used. Most commonly, DHBs reported using one audit tool – either the Royal College of Physicians Audit (E, I, A) or a self-generated audit tool (Q, D, N). A large DHB (A) went on to mention that its audit is part of the Australasian Stroke Unit Network, for which results are not out yet. A medium DHB (D) specified that it modelled its audit tool after the stroke unit tool of a large DHB. Only one large DHB (M) reported using more than one tool (a Royal College of Physicians Audit run by the National Stroke Foundation of Australia, a self-generated audit tool, stroke register audit and a yearly complete audit over a 4 month period). The Stroke Foundation NZ audit was not used by any DHB. See Table 8 for a summary of this data.

Table 8 Summary of DHB responses regarding audit tools used at patient level

	DHB	Royal College of Physicians Audit	Stroke Foundation NZ Audit	Self generated audit	Other	Total
Small	DHB Q			√		1
Medium	DHB D			√		1
Large	DHB E	√				1
	DHB I	√				1
	DHB A	√				1
	DHB N			√		1
	DHB M	√		√	√	2

Total	4	0	4	1	
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Routine audit for stroke service: At service level

The same seven DHBs (50%; small: Q; medium: D; large: E, I, A, N, M) indicated they routinely audit the stroke service provided at the service level, and the other seven (two small and five medium) did not. The seven DHBs that routinely conducted audits were asked the audit tools they had used.

Table 9 presents a summary of the responses of the 7 DHBs. Overall, most of these DHBs used only one type of audit tool, with the Royal College of Physicians Audit (E, A) and the self generated audit (Q, D, N) having a higher usage rate than the Stroke Foundation NZ audit (I). Only one large DHB (M) reported using two audit tools, namely the Royal College of Physicians Audit and the self-generated audit.

Table 9 Summary of DHB responses regarding audit tools used at service level

	DHB	Royal College of Physicians Audit	Stroke Foundation NZ Audit	Self generated audit	Other	Total
Small	DHB Q			√		1
Medium	DHB D			√		1
Large	DHB E	√				1
	DHB I		√			1
	DHB A	√				1
	DHB N			√		1
	DHB M	√		√		2
Total		3	1	4	0	

Comments

Four DHBs that reported not having a routine audit for stroke services at patient and service level (C, B, K, F) gave additional comments, which are provided below:

- *'Recent external review- audited against stroke guidelines.'* (C)
- *'Audits have been done in 1996; 2005; 2006, but not routine and the tools were different and used self-generated tools.'* (B)
- *'We would like to [but] resources are inadequate for this. A number of one-off audits have been done.'* (K)
- *'Some routine stroke clinics audits occur. Service has been evolving within the DHB over 18 months. Patient satisfaction questionnaires completed.'* (F)

J. Use of Guidelines

DHBs were asked if they had protocol or guidelines for the management of stroke. Of the 14 DHBs, 12 (86%) reported they did. Two (small: C; medium: B) reported the opposite. The 12 DHBs using guidelines were then asked if the protocols or guidelines they are using are the same for acute

patients and for inpatient rehabilitation. Eight DHBs reported they are the same (67%) and three (25%) reported the protocols or guidelines are different. One DHB did not respond.

Comments

Five DHBs expressed their comments regarding the use of guidelines. A medium DHB (B) reported that they did not have protocols or guidelines added, and that they had a pathway in 2004 but it was abandoned, although no explanation was given for this. The other four DHBs reported having protocols and guidelines; one medium DHB (D) specified that they did not have a rehabilitation guideline, but that one was being developed. A small DHB (G) also specified that more specific protocols and guidelines were being developed. Similarly, a medium DHB (L) stated that there has been a progressive development of guidelines utilising New Zealand Guidelines Group. Lastly, a large DHB (M) said that they were *“mainly the same guidelines, although there are a guidelines for a small number of conditions that differ for the acute and rehabilitation parts of inpatient care – e.g. there are guidelines for use of tPA in the acute stroke unit and not in rehabilitation”*.

K. Stroke Foundation

In this section, DHBs were asked whether their service routinely used patient information books/leaflets/videos provided by Stroke Foundation New Zealand (SFNZ), whether the DHB service had access to SFNZ field officers, whether the DHB service routinely involved SFNZ field officers during inpatient rehabilitation, and whether their service routinely involved SFNZ field officers at or after discharge.

The majority of DHBs (71%; small: Q; medium: B, L, K, H; large: E, I, A, M, N) reported SFNZ was involved in all four of the above service aspects. Three DHBs (21%; small: C, G; medium: F) indicated that there was involvement/liasion in three of the aforementioned service aspects, but not during inpatient rehabilitation. One medium DHB (D) reported that their stroke service has three of the above service aspects but not at or after discharge.

Additional Comments

A small DHB (C) reported that there were very limited SFNZ resource and field officers. A medium DHB (K) and a large DHB (A) reported that SFNZ field officers attended MDT and attended stroke service meetings. Another medium DHB (F) reported that they routinely offered field officers, and better communication was being achieved with the new field officers. Lastly, a large DHB (M) expressed that all their patients were asked if they would like to be contacted by the Stroke Foundation field officers, either as an inpatient or after discharge. Their stroke nurse specialist met with the field officer once a week to pass on patients' names and other necessary information. The field officer would visit these patients within the hospital. However, the field officers did not attend the DHB's MDT meetings because of concerns about patient confidentiality.

L. Follow Up

DHBs were asked if their service routinely reviewed all patients after hospital discharge (e.g. at a specified time post discharge or post stroke); whether GPs could request review and whether patients and families could self-refer for review. The stroke service of only six DHBs (43% of 14; small: Q, G; medium: H, F; large: I, A) routinely review all patients. However, GPs of all 14 DHBs can

request review, and seven DHBs (50%; small: Q, G, C; medium: F; large: E, I, M) allow patients or families to self-refer for review.

Additional Comments

Two DHBs reported that follow-up is challenging when there is lack of resources, in particular workforce. One of these DHBs reported that they rely on GPs to help identify patients' need.

- *'Only one neurologist 0.1FTE and 0.1 FTE geriatrician are allocated to outpatient stroke care, which is focussed on TIAs. It would be great to be able to offer better outpatient follow up but not enough staff or clinic space.'* (D)
- *'Resources limits the ability to follow up, we rely on GPs to "screen" need.'* (K)

One DHB reported that patients could contact members of the stroke team if they need assistance.

- *'We aim to have all investigations complete and all secondary prevention in place prior to discharge. Most patients have follow-up visits but in some this isn't necessary. However, patients have the contact details of members of the stroke team to contact if there are problems.'* (M)

M. Cultural Specific Programmes

One of 14 DHBs (small: G) reported providing culturally specific programmes. Twelve of 14 DHBs (93%) did not provide culturally specific programmes for stroke patients, and the other DHB (N) did not respond. However, 13 DHBs have cultural support workers to facilitate access and management for stroke. One medium DHB (K) reported that they do not have cultural support.

Comments

Five DHBs commented. One large DHB reported that they have translated an information booklet, available as a form of cultural support:

- *'We have translated our stroke information booklet into Maori, Samoan, Tongan and Chinese. (Service name) provides support for our Maori patients and their families.'* (M)

It appears that some DHBs had a cultural service or programme that was not stroke-specific.

- *'We use generic DHB cultural services, not specific to stroke.'* (K)
- *'Services of the Maori and Pacifica cultural units are available for all relevant patients (not stroke specific) ...'* (I)

Four DHBs reported that they linked patients to a Maori and/or Pacific health care provider to receive appropriate cultural support.

- *'...these also link with the Community Health Workers in PHOs to ensure follow up appointments etc are attended.'* (I)
- *'Maori and pacific Health Units provide support.'* (B)
- *'Maori health worker, part of the role is to encourage whanau in the decision making related to treatments and network with Maori community and Maori community health providers.'* (L)

- *One service within the DHB 'provides Maori health liaison and cultural support workers for patients and staff.'* (H)

Further comments included the following:

- *'Maori and Asian support workers. Funding for Pacific Islanders support workers recently withdrawn.'* (A)
- *'Tikanga Best Guidelines have been implemented.'* (G)

N. Equivalent initiatives that do not entirely fit the descriptions of above services

The DHBs were asked if they operate any equivalent initiatives that do not entirely fit the descriptions the questionnaire used. The following are DHBs' responses:

Small DHB:

- *This DHB reported that they planned to establish a designated stroke unit; it is incorporated in the [DHB] 2020 plan.* (G)

Medium DHB:

- *One DHB (D) reported that they had MDT meeting during acute inpatient stay and weekly teaching sessions for RNs.*
- *Another DHB (H) reported that they had driving assessment for those who request it.*
- *"Driver assessments: by law people can't drive at least until 4 weeks following a stroke. Also, driver assessments are expensive. If a person following discharge wishes to drive, the CARS (community assessment rehab service) does an initial assessment, if they seem ok, the client is suggested to contact St John's for an assessment. Funding for DA is only available for people returning to work or study."*

Large DHB: (A) reported they offer:

- *Mobile (roving inpatient) stroke service with non discretionary referral i.e. proactive searching for patients.*
- *Neurovascular clinic (TIAs and minor strokes)*
- *Stroke registrar training position.*

O. Initiatives DHBs tried implementing but were unsuccessful

Three DHBs (small: G; medium: F; large: M) responded that they did not have initiatives that were unsuccessful. Seven DHBs did not respond. Four DHBs talked about the initiatives that were unsuccessful. The following are the DHBs' responses:

Small DHB:

A small DHB (Q) reported that they tried operating outpatient clinics; stroke patients would be seen collectively by their individual consultant, not as a stroke clinic but as part of the consultants' normal outpatient clinic. There were no justifiable reasons given for refusal of this initiative.

Medium DHB:

A medium DHB (D) reported that after an attempt to unite TIA clinic and stroke service, there still remained a disconnection. Moreover, lack of neurologist FTE workforce was also an issue that inhibited the service.

- *I've tried to unite TIA clinic with stroke service but it's currently run through neurology clinic which makes it disjointed. No one else seems to see this as a problem. I'm in the process of trying to increase neurologist FTEs to get some coverage for myself while I am away which is currently non-existent. Most of the stuff we try happens after much resistance to change is overcome...*

Another DHB (L) reported that they tried implementing a stroke audit and this did not succeed due to lack of time and competing demands on the team.

Large DHB:

A large DHB (A) reported that it had tried to implement an acute stroke unit, but was unsuccessful as it was difficult to convince management of the evidence base and service.

P. Initiatives DHBs would like to implement

Lastly, DHBs were asked about the initiatives they would like to implement for stroke management. Five DHBs (G, B, E, I, N) did not respond, and nine DHBs reported the initiatives that they would like to implement.

The most commonly mentioned initiative that DHBs would like to implement was a TIA clinic. They also agreed that it was generally ideal to implement a formal and efficient clinic to manage and follow-up on TIA patients. In addition, a number of DHBs mentioned their hope to implement an organised (ideally an integrated primary prevention and secondary prevention) stroke clinic or service unit. Some DHBs mentioned that they would like to operate an outpatient follow-up, rehabilitation stroke unit and early discharge rehabilitation service or clinic for stroke patients.

Small DHBs:

- *Stroke clinics*
- *Implementation of an organised stroke service.*
- *TIA clinics- TIA patients are not followed up. If they are not admitted into hospital, they are just advised to see their GP.*
- *We have no stroke clinician at present (big gap in the service I feel)*

Medium DHBs:

- *TPA admission*

- *Rehabilitation stroke unit*
- *Outpatient follow-up for stroke patients*
- *More rapid TIA service*
- *Improve time to CT/ US.*
- *Develop an integrated stroke service with primary prevention, secondary prevention/ TIA services, acute management/ stroke unit rehabilitation and living with stroke. These initiatives for stroke are on our planner.*
- *Early Supported Discharge; Routine Audit.*
- *Formal TIA service. All reflect resource issues. TIA service reflects middle size DHB, limited numbers and need to review within 24-48 hours; hence rely on protocols for D and AAU.*
- *A 'slow stream' rehab service based in a community residential setting for people discharged from hospital and who are not fully ready to return home, where there are dedicated rehab staff (who could work with the DHB team as part of a MDT).*
- *New Zealand stroke guidelines completely – in process of establishing ward organisation to accommodate patients and the TIA service*

Large DHBs:

- *Acute stroke unit*
- *Early discharge stroke rehab*
- *Stroke rehab for < 65 years*
- *Community services for stroke specific needs*
- *Stroke allied health specialist development*
- *We are in the process of applying for funding for a TIA clinic which is one of the remaining gaps in our service. This would run alongside a nurse-led secondary prevention clinic (where most stroke patients would be routinely followed after their discharge from hospital).*
- *We also need to set up a structured (as opposed to ad hoc) staff, patient and family stroke education programme.*

Q. Summary of evidence-based stroke service provision by DHB size

The table below summarises stroke service provision according to DHB size (those DHBs not providing a response are excluded).

Table 10 Summary of stroke service provision according to DHB size

	Small DHBs (%) positive response	Medium DHBs (%) positive response	Large DHBs (%) positive response
Audit Process/Quality Improvement for acute stroke	33	67	80
Overall Leadership in Stroke	67	100	80
TIA Clinic	0	67	60
IV thrombolysis for stroke	0	50	100
Acute inpatient (IP) Stroke Unit	0	50	60
IP Stroke rehab facility for patients <65yrs	33	0	75
IP Stroke rehab facility for patients ≥65yrs	0	17	75
Stroke-specific MDT for rehab patients	33	50	75
Stroke-specific early discharge programme	33	17	40
Day Hospital rehab	50	17	40
Outpatient (clinic) rehab	33	50	80
Community or home-based rehab	67	67	100
Routine audit: patient level	33	17	100
Routine audit: service level	33	17	100
Use of guidelines	67	83	100
Routine follow up of all patients post discharge	67	33	40

R. Discussion and Comment

The major finding of this questionnaire is that many New Zealanders do not have access to an organised inpatient stroke care and the provision of outpatient and community rehabilitation is patchy. Only six of small and medium sized DHBs (and not all large DHBs) have designated areas for inpatient stroke rehabilitation. Outside of the hospital setting, only four DHBs have early supported discharge programmes and only four provide access to Day Hospital rehabilitation. The stroke questionnaire was filled out by 14 of 21 DHBs. Only seven DHBs had organised stroke services in an unrelated 2007 survey with responses from all DHBs. It would therefore be reasonable to assume that the majority of non-responding DHBs do not have organised stroke care.

The failure to establish organised inpatient stroke care is despite unequivocal evidence that such care reduces the risk of death, dependency, or need for institutionalised care, when compared with conventional care. A meta-analysis of all randomised and quasi-randomised studies demonstrated a reduction in the odds of death or institutionalised care for patients receiving some form of specialised inpatient stroke care compared with conventional care¹. Only 18 patients need to receive organised inpatient stroke care to prevent one from dying or being dependent at one year⁸. Organised inpatient stroke is not more expensive than care in a general ward^{1,8,9}. The introduction of a stroke rehabilitation unit in Christchurch resulted in an 8 day reduction in length of stay¹⁰.

The stroke questionnaire also raises concerns about the quality of the services provided. Only two of the six acute stroke units are stand-alone units, with the remainder in designated areas of general medical or neurology wards. There is still no comprehensive stroke unit in New Zealand where acute management and rehabilitation occur in the same ward. On average, only 60% of patients with stroke were admitted to the stroke unit within those DHBs that had them. Only seven of the 14 DHBs reported that patients with stroke were seen by a multidisciplinary team (MDT) expert in stroke. Two DHBs did not use protocols for the management of stroke care. Only seven of 14 DHBs routinely audited stroke care at a service level and seven audited care at a patient level. Once again, this suggests a missed opportunity to identify and address local deficiencies in stroke care, and that the Ministry of Health may not be able to rely on self-reporting by DHBs as an acceptable marker of the quality of services provided.

Only seven of 14 DHBs (3 large & 4 medium) offer a specific outpatient service for new patients with stroke or transient ischemic attack (TIA). The risk of an adverse outcome following TIA is higher than previously thought; with approximately 25% of TIA patients having a stroke, myocardial infarction, sudden death, or further TIA within the next three months. Half of the risk of stroke occurs within 48 hours. A recent large UK study suggested that a move to daily TIA clinics can reduce this risk of stroke by 80%. It is, therefore, of concern that the shortest current waiting time for an appointment in the stroke/TIA clinics, where they exist, is five days, with the longest waiting time at least four weeks. This delay represents a missed opportunity to prevent up to half of the strokes that follow a TIA.

Eight of 14 DHBs (all 5 large & 3 medium) have protocols for the use of intravenous tissue plasminogen activator (tPA). Despite this, few patients are treated with tPA, with five large DHBs treating on average only nine patients in 2006. Ischaemic stroke patients treated with rt-PA are approximately one-third more likely to have complete or near complete recovery compared to those receiving placebo^{11,12}. Only 16 patients needed to be treated with rt-PA to prevent one from dying or becoming dependent⁸, and neurological improvement is seen in one for every seven patients treated. Without organised acute stroke care the numbers of patients receiving stroke thrombolysis is likely to remain small.

The reason for the failure to establish organised stroke care is not clear. In a 2004 survey of New Zealand physicians, almost all respondents thought that stroke units and stroke rehabilitation units were beneficial, so there is no doubt that the evidence that stroke units are effective has been accepted, at least by clinicians⁷. Twelve of 14 DHBs had identified lead stroke clinicians, although one large DHB had not, and one medium DHB commented that their lead clinician had insufficient time. Further improvements are likely to be led by these clinicians, but this approach is likely to be slow and dependent on the drive of the clinicians, and acceptance by hospital managers of the need for organised stroke services. A formalized and compulsory national audit programme of stroke services could be considered by the Ministry of Health, as in England, to ensure regular audit and enable the comparison of service provision between DHBs.

Regional variations in care may also be addressed with the development and implementation of Ministry of Health stroke service specifications, which are based on population size¹⁴. These specifications suggest that hospitals serving more than 180,000 people should aim to have a lead stroke physician, an acute or comprehensive stroke unit, and an expert, stroke-dedicated multidisciplinary team. Smaller hospitals serving fewer than 80,000 people should still have a lead physician but are not necessarily expected to have a stroke unit. Rather, patients should be aggregated within a general ward with an MDT team expert in rehabilitation. Medium sized hospitals should have a combination of these approaches. However, these are recommendations only with no requirement for these specifications to be met, and without DHB and MOH commitment, the further development of organised stroke services will remain patchy.

In summary, there has been a failure to implement best practice guidelines in New Zealand for the care of people with stroke. The evidence in favour of organised stroke care is overwhelming, and achieving this goal should be the highest priority. The situation in New Zealand is unlikely to change without a consistent, national approach to both the mandatory implementation and audit of stroke services as this has already been successful in countries with similar health systems^{16,17}.

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Chapter 7: Overall Conclusions

A. Introduction

The management of chronic conditions poses the greatest foreseeable healthcare challenge for New Zealand and for many other countries over the next few decades. Our own index conditions (CVD, CHF, COPD and Stroke), together with diabetes, mental health, and (for the elderly) dementia, rank most highly among the list of priorities. Fortunately, we have a reasonable idea from the international literature, as documented in our Literature Review, of ways to address that challenge: not least through reorganisation, revision and realignment of health service provision. There is general agreement within the international literature that chronic conditions management (CCM) should largely take place within a primary care and community context. We strongly endorse this view. This, however, does not let secondary care services 'off the hook'. Attempting to get things right in primary care is no excuse for poor provision in secondary care:

- The opinion and evidence base that has led to the view that CCM must be largely a primary care concern has, in the most part, been formulated and gathered in healthcare systems with effective and reasonably comprehensive secondary care service provision.
- Evidence around the need for effective primary/secondary interfaces in CCM is strong.
- The remaining evidence base and guidelines are largely in the secondary care field and in the ABCCNZ study we were looking for initiatives based on evidence.
- Although they represent only a very small proportion of the life journey of a person with a chronic condition, secondary care events are more crucial and life changing (and the most expensive).
- Hospital episodes are at least one appropriate index event on which to base further contacts. In terms of CVD for example, it is estimated that in New Zealand, 15-20% of sufferers per annum have an acute hospital contact ^[1].
- In light of the above we also need to be particularly aware of the fact that, in New Zealand, many patients pay for primary care access and not for secondary care. Even with attempts to modify access for primary care provision for CCM, some patients will access secondary care as the point of entry. Thus, failure to improve secondary care CCM provision as a priority will potentially increase or at the very least perpetuate existing inequality of access to and provision of CCM.

The main purpose of the current 'disease-specific' Stocktake was thus to evaluate that provision and its links with primary and community care in the context of CCM and our four index conditions within the New Zealand public health system. Once again, however, we emphasise that this is a small piece of a very large puzzle and we do not claim to either ask all the questions or provide all the answers.

Nonetheless, in common with the results of our generic Stocktake report (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study] Report: Generic Stocktake Analysis, May 2009) the current results do not make reassuring reading. However, before discussing the results in any detail we feel that it is essential that we re-emphasise an important point, originally made in the generic Stocktake report:

We wish to strongly state that any criticism (in the colloquial sense of that word) we make about services, attitudes, vision (or about lack of these and other parameters) should not be

interpreted as criticisms of clinical colleagues. Many of the members of our team and the authors of this report are clinicians, and we recognise the pressures, constraints and frustrations that our hard working colleagues have to contend with on a daily basis. Our critiques should be interpreted as critiques of vision, opportunity, training, planning, organisation and in some cases funding which can be best summarised as 'the healthcare system and environment' rather than the healthcare workers. Any individual clinician may have the knowledge, awareness and vision necessary to lead or contribute to service redesign or expansion. That does not mean that he/she has the time, opportunity, structure or funding make that redesign/expansion happen.

B. Main Findings

Discussion of disease-specific findings can be found in the latter sections of Chapters 3-6. The remainder of the current chapter concentrates on a critique of the Stocktake results common to all of our index conditions.

Overall Comments:

Our analyses have revealed two themes common to the generic Stocktake and the current disease specific Stocktake:

[1] As previously, our first concern with the data must revolve around the response rate of DHBs.

In this regard we are not wishing to emphasise the possibility that an incomplete response from DHBs may suggest that the data may be to some extent unrepresentative of the national picture (though we of course acknowledge this possibility and will discuss it in more detail below), but that, particularly for a study commissioned by DHBNZ, the lack of engagement of some DHBs must call to question the priority given to CCM development in those districts. It is true that one DHB wished not to take part because of clearly expressed concerns that our methodology was too cognisant of a secondary care perspective at the expense of primary care engagement. We also acknowledge that in the current Stocktake many questions required answers necessitating ascertainment of demographic, continuous, and numerical information, and it was indeed these aspects of the Stocktake that engendered the poorest response. However, engagement of only 13-15 DHBs in the first phase of the current Stocktake (which generally required only 'yes' or 'no' answers around the provision or otherwise of services), was disappointing. As stated above, the completeness of response even within the participant DHBs was also variable, and again lack of time and resource, despite multiple offers of practical assistance from our project managers, was a reason commonly cited for inability to fully complete all questionnaire variables (other reasons are discussed below). We again recognise, of course, the phenomenon of 'survey fatigue', and indeed are aware of one or two particular examples where the current survey clashed with or followed closely on the back of a recent local or national survey asking similar questions. Nonetheless, engagement in any initiative may be crucially dependent on the priority accorded to the issue in question. We will explore this area in more detail in a subsequent analysis of DHBs' priorities as published in their District Strategic Plans, District Annual Plans and other associated strategies. This latter will form part of our Exemplar Analysis report (for our eight exemplar DHBs). An alternative (though equally important) explanation for paucity of data provision by some DHBs particularly in terms of, for example, questions relating to service uptake, access by ethnicity, waiting times and funding, is that DHBs' ability to easily access and manipulate their own data to the future benefit of their services (and of their patients) is limited. Our Generic Stocktake has clearly emphasised already the problems around IT, data management, knowledge transfer and decision support; and the current paucity of information provided in some areas by some DHBs may be further evidence of this.

[2] Again, perhaps the most striking overall finding in the current survey is the **wide variability in perception of service provision between DHBs**. In the UK, such geographical disparity has been termed a ‘postcode lottery’ and has been the subject of much medical, media and lay interest, and of political controversy. The fact that a postcode lottery can exist even within such a nationally ‘cohesive’ service as the UK NHS should result in a lack of surprise at its existence in New Zealand. However, whatever a nation’s system of organising and overseeing its healthcare provision, such a situation must be a cause for concern. It is also noteworthy, and perhaps of even greater concern, that **in many instances variability in service provision appears to relate to DHB size**, with larger DHBs having greater provision not only of ‘technical’ tertiary services, but also of standard care, leadership, patient education and self management, case management and audit. There are, of course, individual exceptions to this and a minority of areas where the converse pattern emerges. Nonetheless, the overall picture is clear and in our view is a sad reflection on healthcare provision in New Zealand. We anticipate that allowing individual DHBs access to their own alphabetical code, even without access to the codes relating to other DHBs, will result in a narrowing of the variability in provision as the ‘poorer performing’ DHBs are incentivised to improve. Even without a publicly available ‘league table’ of performance, which runs the risks of simplistic and inexpert misinterpretation, manipulation, and the introduction of perverse incentives, such a system has been shown in other healthcare situations to be of benefit in this regard (www.renalreg.org [UK Renal Registry, Chapter 6]). In parallel with the current publication we are producing a ‘Precis’ document, which by virtue of brevity will be more accessible to decision makers and which we therefore hope will further facilitate this process.

Leadership:

Our results suggest a good level of clinical leadership in CVD, and in stroke, with 69% and 86% of our respondent DHBs indicating they had a clinical leader for these respective conditions. However, only 29% have a clinical leader for CHF, and 54% report such a position/individual for COPD (40% for LTOT services – with a large number of non-responders). These results for CHF and for COPD are particularly worrying given the general recognition of the importance of leadership, and of clinical and managerial championship in the development of CCM provision. They accord well with the opinions expressed in our ‘Movers and Shakers’ report (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study]: New Zealand expert’s perspectives of Chronic Care Management, May 2009). DHBs’ own impressions provided in our Generic Stocktake report (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study] Report: Generic Stocktake Analysis, May 2009) suggest that organisational and clinical leadership is perceived as reasonably well provided (probably true for CVD and stroke but demonstrably less true for CHF and COPD) but *programme championship* less so. Even in CVD and Stroke, as well as for CHF and COPD, there was clear evidence of a greater provision of clinical leadership in larger DHBs. Many DHBs clearly have some work to do in attracting and/or developing leadership and championship in some CCM areas. Whether DHBs chose a disease specific pathway or a generic pathway to further CCM development will influence their strategy in this regard.

Audit and Quality Improvement:

It is not an exaggeration to say that the situation in respect of audit and quality improvement should be a major cause for concern. Again the situation was, with some exceptions, worse in smaller DHBs, but the failure to critically examine many aspects of service provision was seen across all four of our index conditions. Indeed some of the responses suggested that the concepts of continuous quality improvement and of clinical indicators were misunderstood. This accords with the general impression of a lack of adequate evaluation of clinical services. Should this situation continue it would not bode well for the future development of CCM that needs to take place across DHBs: as without reliable, local evidence of access, workload and effectiveness, service design and redesign is

a blind exercise. On a more immediate level it also indicates missed opportunities to identify (and remedy) local deficiencies in care. The Ministry of Health and the public may also not be able to rely on self-reporting by DHBs as an acceptable marker of the quality of services provided.

Use of protocols and guidelines:

It was gratifying to see that guidelines for LTOT assessment in COPD were universally employed. With this exception, the reported use of clinical guidelines and protocols in day-to-day management for our four index conditions can be perhaps described as dichotomous. Overall, half of all respondent DHBs had no local guidelines in place for the management of acute exacerbations of CHF, and 40% had none for the management of acute exacerbation of COPD. The situation was much better for the management of acute coronary syndrome and acute stroke, where 77% and 86% (respectively) of respondent DHBs employed local guidelines. This apparent disparity between COPD and CHF on the one hand, and CVD and Stroke on the other may reflect the differences in clinical leadership in these areas. Once again there was the suggestion of a trend for greater use of guidelines in larger DHBs though differences were less marked than for the use of audit. The limited use of guidelines in acute exacerbations of CHF and of COPD is particularly worrying as most patients with these conditions are admitted (not inappropriately) to general medical or geriatrics wards rather than to specialist cardiac or respiratory units. Guidelines in themselves are not 'the answer' to comprehensive patient management, but they can be useful tool and can act as benchmarks to facilitate audit and quality improvement. They need to be in accessible and usable form, and the perceived failures of many cases in this regard, previously highlighted in our generic Stocktake report, may also be a factor in the current findings, further emphasising the need for improvement in the availability and quality of (particularly IT based) decision support tools. Reinvention of the guideline wheel in all 21 DHBs would have significant resource implications and this speaks to the need for greater cooperation among DHBs in this area.

Self-management and education:

Self-management and education programmes are a cornerstone of CCM practice. They must not be seen in isolation, but as part of a package of CCM provision. Indeed there is evidence (particularly in COPD) that when used in isolation their impact is minimal at best. However, the evidence base around self-management/education as part of a comprehensively delivered CCM programme is good. As stroke and TIA is generally an exception to this we did not ask about self-management in stroke. However in CHF, CVD and COPD the situation was again somewhat patchy. However, in contrast with other areas, it appeared that self-management and education (in CVD and COPD at least) was more widely incorporated into routine patient care in small and medium-sized, rather than in larger, DHBs. Overall, 64% of respondent DHBs indicated they offered self-management and education programmes in CHF, 60% in COPD and 69% in CVD. These figures are in fact reasonably reassuring, especially given the self-perceptions and impressions contained within the generic Stocktake report, that such programmes were not widely available and well-developed within DHBs. Nonetheless, even where self-management programmes exist, the staffing levels reported to us were, with few exceptions, disappointingly low.

Case management:

Again, for the same reasons as indicated above, we did not enquire about case management in Stroke. However, case management provision in CHF, CVD and COPD was poor, with programmes around CHF in 57% of DHBs, around COPD in 47%, and around CVD in 46%, with low staffing levels even where programmes were in place. We are aware from our personal clinical experience that these services are expanding across New Zealand (and this experience was reinforced by comments from DHBs around plans for future development in the present report). Thus, the reported results

represent a snapshot in time. However, we would encourage a diversion of available resources into this valuable area. Again, whether services are established on a generic format or a disease specific format will most depend upon local need and availabilities, but there is enormous potential human resource available for nurse-led developments in this field. Our Exemplar Analysis Report, to be published separately, will further examine this area.

Are our findings valid?

As we have previously stated in our generic Stocktake report, any survey is only as good as the accuracy of the information provided to it. The current survey is dependent on the accuracy and completeness of the knowledge of DHBs employees (both clinicians and others). We had no control over who completed the survey within individual DHBs (though we did request that a wide variety of professional groups be involved). We are, however, aware of the considerable efforts that DHBs employed to ensure delivery of information and thus as well as being deserving of our gratitude this reassures us of the reasonable accuracy of our report. We are further reassured by the 'internal' and 'external' consistency of our findings. Internally, our findings are reinforced by the consistency of information we have obtained from and reported in the current Stocktake, the generic Stocktake and the 'movers and shakers' interviews. Our exemplar analyses (to be reported separately) will further reinforce our Stocktake findings. Externally, a variety of surveys and audits in our disease specific (or related) areas have been conducted in New Zealand at around the same time as our own. These have all produced similar results and conclusions. We refer in particular to the New Zealand Acute Coronary Syndrome audit ^[2,3], the survey of respiratory medicine services by the New Zealand Branch of the Thoracic Society of Australia and New Zealand (TSANZ) conducted in 2006 ^[4], and a national survey of stroke rehabilitation services conducted in 2007 ^[5].

Once again, however, as with our Generic Stocktake, we are far from claiming that the present report paints a complete picture. We recommend that it be seen as contributing pieces to a large and ever-changing jigsaw. As mentioned above, the report is a snapshot in time of an ever-changing and (hopefully) evolving service.

The future:

An extremely encouraging finding of the current Stocktake is that even where services do not exist, or exist in a limited format, this does not usually appear to result from a lack of knowledge within DHBs about the drivers behind CCM and the structures and processes needed to implement it. In response to the questions around initiatives DHBs would like to implement, and around initiatives they had previously tried and failed, there was evidence of an excellent knowledge base; which was, however, confronted with the barriers of limited leadership, and lack of financial and staff resource, and as evidenced in our generic Stocktake report (Alleviating the Burden of Chronic Conditions in New Zealand [The ABCC NZ Study] Report: Generic Stocktake Analysis, May 2009), difficulties around decision support. Similar findings emerged in many instances in our exemplar visits and our national workshops (particularly in the standard setting workshops). This provides a level of optimism for the future. The enthusiasm for and knowledge base around CCM that exists within DHBs in New Zealand should be the cornerstones upon which the services of the future are being and can be built. Given the current limited and patchy development of CCM and allied acute services across the country, the construction of an effective, available and equitable CCM service is no small task. We believe, however, that as well as being essential it is eminently possible.

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