NSW GOVERNMENT
ACTION PLAN
FOR HEALTH

NSW Clinical Service Framework for

Heart Failure

Overview of the framework and its standards

Volume 1

'Setting statewide standards of care'

NSW HEALTH
Working as a Team

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Foreword

Chronic heart failure (CHF) is estimated to affect one percent of the general population, three to five percent of people over 65 years and ten percent of people aged over 75 years in Western countries. In Australia and comparable countries, both the incidence and prevalence of CHF are increasing. Australian projections suggest that the prevalence of CHF will double over the thirty-year period 1996-2026. In 1999-2000, heart failure was the principal diagnosis in 13,326 hospital separations in NSW. In many analyses, heart failure is the leading cause of medical admission to hospital in patients over 65 years of age. Readmission rates are also high with 30 to 50 percent of patients being readmitted within six months of discharge. Many of these readmissions are preventable. In addition to the mortality associated with CHF, there is significant morbidity and poor quality of life due to chronic symptoms of CHF.

The profile of CHF patients also appears to be changing as the population ages. The health care system needs to meet the challenges posed by an increasing proportion of elderly patients with predisposing conditions for CHF. It is imperative that prevention and management of predisposing conditions and best practice standards of care are available across NSW for people with or at risk of CHF. Integration and coordination of service provision across primary, community and acute care services throughout the continuum of care is essential. The *NSW Clinical Service Framework for Heart Failure* seeks to address these challenges.

The framework draws on a significant body of evidence regarding best practice in the management of CHF. The framework also exemplifies the underlying philosophy of the NSW Chronic and Complex Care Report *Improving health care for people with chronic illness – A blueprint for change 2001-2003* which outlines a number of recommendations to ensure a more integrated, coordinated and patient-focused approach to the health care needs of people with chronic illness.

We are pleased to endorse the *NSW Clinical Service Framework for Heart Failure*. We commend the work of the Cardiovascular Clinical Expert Reference Group and the Cardiovascular Special Interest Group co-chaired by Professor Geoffrey Tofler and Dr Ana Singer, The Health Projects Group at the University of Sydney's School of Public Health and numerous affiliated health professionals throughout the NSW Health system whose combined knowledge and expertise have contributed to the development of this framework.

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Co-Chair, CCCICG

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Executive summary

Background

Health care systems across the world are facing increasing demand for services for people with chronic diseases such as heart disease, cancer, chronic obstructive pulmonary disease and asthma. There has been a global drive to improve services for people with chronic and complex conditions by reconfiguring health services to provide more integrated, coordinated and patient-focused care across all health sectors throughout the continuum of care.

The NSW Chronic Care Program was established under the NSW Government's Action Plan for Health in 2000 to address the three priority health areas of cardiovascular disease (and its risk factors), cancer and respiratory disease. The *NSW Clinical Service Framework for Heart Failure* has been developed as one of many initiatives being undertaken by the NSW Chronic Care Program under the leadership of the Chronic and Complex Care Implementation and Coordination Group (CCCICG) to improve service provision for people with chronic and complex conditions. The CCCICG established the Cardiovascular Clinical Expert Reference Group that has overseen the development of the framework.

The *NSW Clinical Service Framework for Heart Failure* outlines a clinical service framework for chronic heart failure (CHF) in NSW. Its key objectives are to define statewide standards of care for the prevention, diagnosis, treatment, rehabilitation and palliation of people with CHF in NSW and to specify service models that enable the delivery of services that meet these standards.

The framework covers the full spectrum of services for the prevention, diagnosis and management of CHF, translating research-based evidence into models of care. Both primary and secondary prevention are included. Diagnosis includes the investigation of causal, precipitating and exacerbating factors. Management includes treatment, rehabilitation and palliative care.

Key objectives

The standards in this framework have been developed to achieve the following key objectives:

Standard	Key objective
1 Prevention of CHF	To prevent myocardial damage that could lead to CHF
2 Detection and management of factors that precipitate and exacerbate CHF	To detect and manage factors that precipitate or exacerbate CHF in people at increased risk of CHF, those with early asymptomatic disease and those with manifest CHF
3 Diagnosis of CHF	To accurately and promptly diagnose CHF, seek reversible causes and assess the severity of the disease
4 Treatment of acute, life-threatening manifestations of CHF	To provide effective emergency treatment to relieve symptoms, prevent damage to other organs and promote cardiac function
5 Pharmacological management of CHF	To ensure that CHF patients are prescribed the right medications in the right doses and that these are taken correctly, as prescribed
6 Multidisciplinary approach to CHF management	To ensure that all CHF patients have access to appropriate multidisciplinary care
7 Continuing care of CHF	To ensure that CHF patients receive appropriate ongoing non-pharmacological management and that effective linkages exist between hospital and community based medical and other health care and related services, providing CHF patients with continuous high-quality care that prevents relapse and associated unplanned or avoidable hospital admissions
8 Rehabilitation	To ensure that all CHF patients have access to hospital or community based cardiac rehabilitation
9 Palliative care for patients with end-stage heart failure	To maximise the quality of life and comfort of patients with intractable CHF and provide psychosocial support to the patient, the family and other carers
10 Monitoring of quality and outcome indicators	To collect data on quality of care and health outcomes for the improvement of patient care in CHF

Framework structure

This framework consists of two volumes:

Volume 1 – Overview of the framework and its standards

This volume outlines the key components of a new approach to coordinated and integrated care for people with CHF. Volume 1 provides a summary of the ten evidence-based standards and recommendations for best practice care for patients with or at risk of heart failure. It also sets out the targets and milestones for heart failure by which Area Health Services will mark their rate of progress towards achieving these standards. A framework implementation strategy and assessment of progress are discussed in Sections 4 and 5.

Volume 2 – A Practice Guide for the Prevention, Diagnosis and Management of Heart Failure in NSW

Volume 2 is a more clinically focused document. It presents in more detail the ten standards for the prevention, diagnosis and management of heart failure. The objectives, key prevention, diagnostic or management points, main recommendations and information underpinning each standard are provided. Demonstrations of compliance are detailed for each standard. Wherever possible, levels of evidence (as defined by the National Health and Medical Research Council – see Appendix A) are given to support key points and recommendations and relevant literature is briefly reviewed.

Volume 2 also includes four models of care that demonstrate the way in which care can be delivered in accordance with the heart failure standards in metropolitan, urban, rural and remote settings. The models of care refer to services for people with:

1. Elevated risk of CHF or with asymptomatic early disease
2. Stable symptomatic CHF
3. Acute exacerbation of CHF
4. End-stage heart failure.

Assessing progress

Milestones and targets by which compliance is to be demonstrated for each standard are clearly set out in this framework. Progress will be monitored at regular six monthly intervals using a standardised reporting proforma on the demonstrations of compliance due for that particular six-month period. This is important to demonstrate ongoing improvements in clinical outcomes and to indicate where modifications in our systems of care are needed to improve care provided to people with heart failure.

The monitoring and reporting process is not intended to be onerous and does not require the establishment of comprehensive and costly IT systems where these do not exist. It is about establishing quality improvement processes within available resources. For example, monitoring a standard may involve monitoring a selected sample of patients over a limited time period, rather than monitoring all patients attending that service. Establishing systems using this quality improvement methodology is a part of core business in providing the best care available for people with heart failure.

The success of this framework in meeting its key objectives depends on the strong and demonstrated commitment of the NSW Department of Health and each Area Health Service to supporting its implementation. It also hinges upon the active participation of clinicians and health care providers in both the hospital setting and the community. Strong and effective partnerships between all of these groups will ensure that meaningful change is effected.

1. Introduction

Background

Chronic diseases such as heart disease, cancer, chronic obstructive pulmonary disease and asthma are posing an increasing challenge to health care systems across the world. There is global recognition that health services for people with chronic and complex conditions need to be reconfigured to provide more integrated, coordinated and patient-focused care across all health sectors throughout the continuum of care.

The Chronic and Complex Care Implementation Coordination Group (CCCICG) was established under the NSW Government's Action Plan for Health in 2000 to address these issues with regard to the three priority health areas of cardiovascular disease (and its risk factors), cancer and respiratory disease. The NSW Chronic Care Program overseen by the CCCICG has three broad aims to:

- improve the quality of life of people with chronic and complex conditions
- improve the quality of life of their carers and families
- reduce the number of crisis situations and avoidable admissions to hospital.

Evidence based best practice strategies and recommendations were identified by the CCCICG in conjunction with the Cardiovascular, Respiratory and Cancer Clinical Expert Reference Groups as the interventions that would best achieve these aims. These include:

- placing patients at the centre of care
- fostering an integrated, coordinated approach across the continuum of care
- development of agreed statewide standards of care
- clinical governance
- fostering more timely and effective treatment in a community setting
- streamlining admission and discharge planning processes and practices
- patient education and self-management.

A key initiative of the NSW Chronic Care Program has been the development of clinical service frameworks for each of the priority areas.

The framework

The *NSW Clinical Service Framework for Heart Failure* outlines best practice standards for the prevention, diagnosis and care of people with chronic heart failure (CHF) in NSW.

The objectives of the framework are to:

- define statewide standards of care for the prevention and diagnosis of CHF and the treatment, rehabilitation and palliation of people with CHF
- specify service models that enable the delivery of services which meet these standards
- specify criteria, including indicators, that can be used to evaluate the performance and quality of services for CHF
- provide linkages to guidelines and other information sources that might assist clinicians and others in delivering the services to communities and individuals, including resources available from the National Heart Foundation of Australia and other relevant organisations as well as related NSW Department of Health policy documents and guidelines such as the NSW Health *Aboriginal Chronic Disease Service Framework*
- highlight areas where action is warranted to improve the organisation and delivery of services.

The overall intent of the framework is to:

- improve the health of people with CHF in NSW
- improve the quality of care and services provided to people with CHF
- reduce variations in care and inequalities in health associated with CHF
- reduce avoidable and preventable admissions and readmissions to hospital associated with CHF
- promote the implementation of research based knowledge in practice

- enable the implementation and evaluation of statewide standards for the prevention and diagnosis of CHF and the treatment, rehabilitation and palliation of people with CHF.

For the purposes of this framework and unless otherwise specified, the term 'heart failure' means 'chronic heart failure', and is a synonym for 'congestive heart failure'. It includes systolic and diastolic heart failure as well as combined systolic and diastolic heart failure.

The most common causes of heart failure include:

- Ischaemic heart disease (coronary heart disease) and prior myocardial infarction
- Hypertension

Other causes include:

- Diabetes mellitus, which is both a risk factor for ischaemic heart disease and itself causes damage to the myocardium
- Cardiomyopathies (eg idiopathic, alcoholic, HIV-related, peri-partum or medication-induced)
- Myocarditis, usually associated with viral infection
- Valvular heart disease
- Chronic arrhythmias.

A distinction is made between conditions that *cause* CHF and conditions that *precipitate* or *exacerbate* it. For example, long-standing hypertension may cause CHF, while an acute elevation of blood pressure (with or without a history of chronic hypertension) may precipitate or exacerbate CHF. These conditions respectively may cause, precipitate or exacerbate CHF in a patient who is otherwise stable. In some circumstances the same condition may both cause and precipitate or exacerbate CHF. A common example is ischaemic heart disease.

It should be noted that the standards outlined in this framework are not meant to substitute for the independent medical judgement of a clinician in relation to the diagnosis and treatment of individual patients.

Scope and emphasis

The clinical service framework for heart failure covers the spectrum of care including prevention, diagnosis, treatment and continuing care of CHF in adults. Emphasis is also placed on the importance of secondary prevention that acknowledges relapse prevention of CHF. The framework draws on existing published guidelines, with particular reference to the *Guidelines on the Contemporary Management of the Patient with Chronic Heart Failure in Australia* (2002) and the *Reducing Risk in Heart Disease: Guidelines for preventing cardiovascular events in people with coronary heart disease* (2003) produced jointly by the National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand.[1,2] It also draws on United Kingdom National Service Frameworks[3] and on evidence-based guidelines from the United Kingdom, Canada and the United States of America.

The framework's recommendations are summarised in ten standards that address the following aspects of heart failure:

1. Prevention of CHF
2. Detection and management of factors that precipitate and exacerbate CHF
3. Diagnosis of CHF
4. Treatment of acute manifestations of CHF
5. Pharmacological management of CHF
6. Multi-disciplinary approach to CHF management
7. Continuing care of CHF
8. Rehabilitation
9. Palliative care for patients with end-stage heart failure
10. Monitoring of quality and outcome indicators.

The framework also describes four models of care that illustrate the way in which the framework's standards and recommendations would apply in different geographical settings for four different clinical presentations (Volume 2, Section 3). These models of care provide a description of the resources (people with particular skills, facilities, equipment, materials and infrastructure) that are needed to provide an organised system of care for a particular aspect of the needs of patients with CHF in a particular type of setting.

2. Principles, epidemiology and underpinning evidence for standards for prevention, diagnosis and management of CHF in NSW

Underlying principles

The *NSW Clinical Service Framework for Heart Failure* is based on the following principles:

- Optimal management of heart failure emphasises prevention – prevention of the development of heart failure, prevention of exacerbations, prevention of chronic deterioration and minimisation of preventable admissions and readmissions to hospital.
- Services and treatments are safe, of high quality and based on the best available evidence, categorised according to levels of evidence defined by the National Health and Medical Research Council (see Appendix A).
- Services are flexible and accessible and different elements of the service delivery system are effectively linked to provide continuity of care.
- Care is patient centred, accommodating the needs, capacity and preferences of individual patients.
- Patients are equipped for self management, enabling them to maintain their independence and control.
- Care is community focused, with an emphasis on maintaining patients in the community and reliance on general practitioners and other clinicians working in community settings.
- Care relies on specialist input on a referral basis for assessment and management.
- There is a commitment to monitoring and epidemiological surveillance of services and service outcomes.

Epidemiology of chronic heart failure (CHF)

Cardiovascular diseases are the leading cause of disease burden in NSW in both sexes, accounting for almost one-quarter of years of healthy life lost due to premature death, disease and injury. Cardiovascular diseases accounted for 18,280 deaths (40 percent of all deaths) in NSW in 2000.[4] Of these deaths, coronary heart disease (or ischaemic heart disease) caused 51 percent and stroke caused 25.8 percent of deaths. The next most common causes of death from cardiovascular disease were heart failure and peripheral vascular disease.[4] National data indicate that in 1998, heart failure accounted for two percent of all deaths and five percent of deaths from cardiovascular disease in Australia, with cardiovascular disease accounting for 40 percent of deaths overall.[5]

Heart failure incidence, prevalence and deaths

Chronic heart failure (CHF) is estimated to affect one percent of the general population, three to five percent of people over the age of 65 years and 10 percent of those aged over 75 years in Western countries.[6] Fifty percent of patients die within a five-year period.[7]

While reliable data on the prevalence of CHF in Australia are not available, projections suggest that the prevalence will double over the 30-year period from 1996 to 2026, with more than 300,000 patients aged over 65 having suffered from cardiac failure by 2026.[8] Approximately one third of these patients will be aged 65 to 75 and two thirds will be aged over 75 years.

In countries such as Australia, New Zealand, the United States and the United Kingdom, the occurrence of CHF is increasing faster than any other cardiovascular disorder. Both incidence and prevalence are increasing in parallel with the well-documented age-adjusted decline in mortality from coronary disease in these countries.[9, 10, 11, 12]

The increasing incidence and prevalence of CHF may be explained by the:

- ageing of the population
- survival of increasing numbers of elderly people with predisposing conditions for CHF, notably hypertension and ischaemic heart disease, and including acute myocardial infarction[12, 13, 14, 15, 16]
- increasing survival of people with CHF.[5]

Deaths from heart failure occur mainly among older Australians, with 90 percent of these deaths occurring among those aged 75 and over.[5] Death rates from heart failure in Australia have declined by more than 39 percent over the 12-year period from 1987 to 1998.[5]

Aboriginal vascular health

Aboriginal and Torres Strait Islander populations are more likely to have cardiovascular conditions than other Australians.[5] It is recognised that common risk conditions created by the social and environmental circumstances in which many Aboriginal people live place them at greater risk for chronic disease such as diabetes and heart disease. The resulting increased possibility of the uptake of risk behaviours such as smoking, physical inactivity, poor diet and nutrition and excessive alcohol use may lead to physiological risk factors such as hypercholesterolaemia, hypertension, hyperglycaemia and obesity.[17]

While the quality of data on Aboriginal and Torres Strait Islander people is limited, available data indicate the following:

- Indigenous Australians were three times more likely to die from heart failure than other Australians during the period from 1996 to1998[5]
- 41 percent of indigenous people reported being a current smoker compared with 24 percent of non-indigenous people in 1997 and 1998 NSW Health Surveys[4]
- in the same period, seven percent of indigenous people reported having diabetes as compared with 3.5 percent of non-indigenous people.[4]

Changing profile of CHF patients

Recent reports indicate that the profile of CHF patients is changing.[10, 13,16,18,19]

- There are more elderly patients and an increasing proportion of females.
- Increasingly, the underlying cause of the heart failure is ischaemic heart disease, rather than hypertension.
- An increasing proportion of CHF patients have diastolic heart failure (ie heart failure with preserved systolic function).
- Pulmonary congestion is less common.
- Death is more likely to occur suddenly than to follow a period of intractable progressive impairment.

Although age and traditional cardiovascular disease risk factors are likely to be associated with the development of CHF in elderly people, prevention and management of ischaemic heart disease, particularly myocardial infarction, is increasingly important in addressing the 'epidemic of heart failure'.[18, 20, 21] Chronic heart failure differs from acute heart failure and patients with the more severe and chronic forms of CHF are most likely to use health resources.[10]

CHF in general practice

Heart failure represented 0.6 percent of all problems managed in a study of general practice activity in Australia for the period April 1998-March 1999.[22] Approximately eight percent of these encounters were for newly diagnosed cases. Extrapolation from these figures suggests that about 899,000 general practice encounters take place throughout Australia for heart failure each year, with about 71,000 new cases of heart failure being diagnosed in general practice each year. Patients managed for heart failure by general practitioners were predominantly female and aged over 75 years. Many had co-morbidities with hypertension and diabetes being the most common.[22]

Patterns of hospital admission and readmission for CHF

In 1998-1999, CHF admissions accounted for approximately 10 percent of hospital admissions for cardiovascular disease throughout Australia, while stroke accounted for approximately 12 percent and ischaemic heart disease 36 percent.[5] In 1999-2000, heart failure was the principal diagnosis in 13,326 hospital separations in NSW.[23] This represents approximately one percent of all separations from public hospitals in NSW and approximately 0.3 percent of all separations from private hospitals.

Over the five years from 1993/94 to 1997/98, the NSW Department of Health's Inpatient Statistics Collection recorded 241,992 hospital separations where CHF was recorded as a diagnosis (often in the presence of other co-existing diagnoses). In 25 percent of these separations, heart failure was the principal diagnosis. The rate of CHF-related separations was ten times higher in patients aged over 85 than those aged 55 and under. Length of stay averaged 12 to 13 days, with females generally having a longer hospital stay than males.

Hospital admissions for CHF have increased. Notwithstanding decreases in length of stay and in-hospital mortality, significant increases in costs have been incurred as patients undergo more (and more expensive) interventions and require more care post-discharge.[24]

Research has focused on the causes of unplanned hospital admissions and readmissions and the associated costs to the patient and health system. A recent NSW study reported that 11 percent of almost 900 patients admitted to hospital with a primary diagnosis of CHF died during admission, 29 percent died within one year of admission, 35 percent were readmitted within one year and 49 percent died or were readmitted within one year.[25] Death and readmission rates were significantly higher for those aged over 70 than those aged under 70. Median length of stay for the entire group was eight days, with older patients having longer hospital stays than younger patients. The study also showed an association between co-morbidities and poor outcomes such as probability of readmission to hospital and/or death.

Research examining reasons for the poor health outcomes and health-system outcomes associated with CHF has focused on the causes of unexpected and avoidable hospitalisation, poor patient prognosis and variations in physician practice. Hospital readmissions remain the most accurate predictor of mortality and increased disease burden.[21] Particular health-system, practitioner and patient characteristics appear to be linked to poor patient outcomes and associated high use of resources and costs.[7, 10, 26]

Problems that have been identified as contributing to high readmission rates for patients with heart failure include:

- non-compliance with medication regimens
- inadequate discharge planning
- inadequate follow-up
- poor social support
- failure of patients and/or their carers to seek prompt attention when exacerbation of symptoms occurs[27, 28, 29, 30, 31]
- failure of older patients to report symptoms that they believe to be age-related rather than indicative of illness.[32, 33, 34, 35]

Various patient characteristics have been found to be strongly predictive of higher hospital readmission rates, including:

- advanced age
- presence of co-morbidities (especially cognitive loss, diabetes and renal impairment)
- social isolation
- depression
- prolonged index admissions.[36, 37, 38]

Inadequate diagnosis and management of CHF has also been attributed to organisational characteristics which impact negatively on care, discharge planning and follow-up.[19, 29, 39] It has been shown that poor-quality care for CHF (as assessed by a panel of independent experts) is likely to lead to repeated admissions and poor outcomes,[39] including a higher risk of mortality.[40] US data suggest that nearly one million unplanned hospitalisations for CHF each year may be prevented by improvements in patient evaluation and care[7] and that up to half of the admissions categorised as 'low risk' because of the

absence of life-threatening complications could be managed without hospitalisation.[41] Other studies have suggested that 50 to 75 percent of readmissions may have been preventable[31, 42, 43] and that current practice is insufficiently effective to prevent hospital readmissions.[38, 44]

Marked variations in prescribing practices across facilities have been observed, and these may be due in part to differences in organisational characteristics.[19] US studies report that patients who are older, in larger facilities or from nursing homes are less likely to be prescribed ACE inhibitors.[19, 45, 46] Swedish data suggest that less than 30 percent of CHF patients in the community are prescribed ACE inhibitors and most of these at doses far below those demonstrated to be effective in clinical trials. High readmission rates within three months of discharge from hospital for CHF have been reported (29-47 percent), with almost 50 percent of readmissions being preventable.[47]

Underpinning evidence for the standards for CHF

The following is a summary of the underpinning evidence and best practice recommendations contained in the standards that are detailed in Volume 2. Key references and NHMRC levels of evidence are provided where available.

Prevention of CHF *(Standard 1)*

For those with or at risk of CHF, treatment of coronary risk factors (particularly smoking, hypertension and hypercholesterolaemia) reduces the risk of myocardial damage and contributes significantly to the prevention of CHF.[1]

Current evidence and guidelines recommend the following measures for the prevention of CHF:

- regular measurement and vigorous control of hypertension[48, 49]
- regular assessment of blood lipids and prescription of statins when indicated[50]
- vigorous control of diabetes[51]
- lifestyle interventions including:
  - smoking cessation[49, 52]
  - weight reduction[49, 53]
  - healthy eating and reduction of salt intake[50, 54]
  - regular physical activity[3, 55]
  - low risk alcohol consumption[3, 51]
- adequate and prompt treatment of myocardial infarction.[1]

A Working Party convened by the National Heart Foundation of Australia recently evaluated the systematic reviews of the evidence regarding links between psychosocial risk factors and coronary heart disease (CHD).[56] The review's conclusions, which are summarised in Appendix B, have implications for people with or at risk of CHF. They indicate that the presence of depression, social isolation, lack of quality social support and experience of acute and catastrophic life events may have an adverse impact on outcomes for this group of patients. Consideration and management of these factors should therefore be a part of the routine care of patients with CHF. Clinicians can ascertain the presence of these risk factors through simple questioning. Further reference is made to these issues in Volume 2 (*Standard 1: Prevention of CHF, Standard 6: Multidisciplinary approach to CHF management* and *Standard 7: Continuing care of CHF*).

Diagnosis of CHF *(Standard 3)*

- All patients suspected of having CHF should undergo a comprehensive clinical assessment (*NHMRC – expert opinion*). The key components of comprehensive clinical assessment are further detailed in Volume 2 (Standard 3).
- All patients with diagnosed heart failure should have an echocardiogram performed (*expert opinion*). The echocardiogram should be interpreted by a physician with expertise in echocardiography. For patients in settings (eg rural or remote) where echocardiography facilities are not readily available, the patient should be subsequently referred for an echocardiogram to a hospital or consulting office where such facilities exist. In general, echocardiography does not require urgent transfer to such a facility and can be performed following hospital discharge or as a referral if the patient is in the community. However in acute and severe heart failure, urgent transfer may be required.

- An assessment of the severity of CHF should be made for all patients, using standardised classifications and scales such as the New York Heart Association Classification of Heart Failure[57] or the Duke Specific Activities Scale of Functional Capacity.[58] Further details regarding these tools are provided in Volume 2 (Standard 3).
- Symptoms and signs that contribute to the diagnosis of heart failure lose specificity in the elderly. Weakness, anorexia and fatigue become more common, confusion can be a presenting feature, while peripheral oedema is common and less specific. This can lead to patients being incorrectly labelled as having heart failure (and receiving diuretics inappropriately), or conversely the diagnosis of heart failure is missed. Additional tests such as echocardiography may particularly aid in diagnosis. The use of invasive investigations needs to be considered on an individual basis. Management of heart failure in older patients is discussed in more detail in Volume 2 (Standards 3 and 5), with emphasis on a multidisciplinary approach and the role of the geriatrician and general physician.
- Once the diagnosis of heart failure is made, it is important that the patient and family are informed as to the nature of the disease, using appropriate and understandable terminology. The patient's general practitioner will usually fulfil this role when the diagnosis is made in the community. Patients should be encouraged to become involved in their own management and to understand the principles of non-pharmacological and pharmacological therapy and the importance of ongoing adherence. Further detail regarding patient education and self-management issues are provided in Standard 7.

Multidisciplinary approach *(Standard 6)*

- Involvement of a cardiologist or a general physician with an interest in cardiology has been shown to be effective in reducing hospital admissions and improving prognosis for patients with CHF. Specialist input tends to promote optimal medication therapy, ensures coordinated management of co-morbidities[59, 60,61,62,63,64,65,66] and appears to lead to a more active therapeutic approach to older and sicker patients.[67, 68, 69]
- Allied health involvement is important in the optimal management of patients with CHF. Allied health professionals can offer a wide range of beneficial services, including dietary advice, involvement of pharmacists to enhance adherence to medication regimes and minimise medication interactions, design of appropriate individualised rehabilitation programs including physical activity and assessment and assistance regarding social and psychological risk factors.
- There is strong evidence establishing the benefit of a heart failure management strategy coordinated by a registered nurse with heart failure interest and expertise.[43, 69, 70, 71] This intervention has demonstrated improvements in quality of life, adherence to fluid and dietary restrictions and medication regimes, and reduced readmissions. Involvement of the patient, family and hospital and community based health professionals in development of such a program is important to its success. In addition to providing patient education and assisting in coordination of communication between all the care providers, such a management program should also include an early home visit following discharge (within four to seven days), early telephone follow-up and continued telephone availability, a home based physical activity program and establishment of community based support and activities for patients and carers. Practice nurses in primary care settings are emerging as a valuable resource in chronic disease management. This may include their assuming a role in management strategies and care planning of individual patients in collaboration with Area Health Service staff as well as in committee structures for heart failure service planning.

Pharmacological management of CHF *(Standard 5)*

Current evidence and guidelines regarding optimal pharmacological management of CHF are outlined in detail in Standard 5 in Volume 2. A summary of the recommendations made in Volume 2 regarding pharmacological management of CHF, along with the NHMRC level of evidence, is as follows:

1. Unless contraindicated, ACE inhibitors should be taken by all patients with symptomatic or asymptomatic CHF resulting from impaired left ventricular function (*NHMRC level of evidence I*).

   ACE inhibitors have consistently shown beneficial effects on mortality, morbidity and quality of life for people with systolic (left ventricular) heart failure in large-scale clinical trials.[72,73,74,75,76] (The beneficial effects of ACE inhibitors have been demonstrated in systolic CHF only – results of clinical trials in diastolic CHF have yet to be published.)

2. Diuretics should be prescribed for all patients who have evidence of fluid retention, ie peripheral oedema, pulmonary oedema or an elevated jugular venous pressure (*level of evidence II*).

   Diuretics produce symptomatic benefits more rapidly than any other medication used in CHF. They are the only medications that can adequately control the fluid retention of CHF.

3. Every patient with left ventricular (systolic) heart failure treated with a diuretic should also be treated with an ACE inhibitor (in the absence of specific contra-indications), even if the CHF symptoms and signs resolve with diuretic therapy.

4. Approved beta-blockers should be considered for patients with CHF who:

   - are already being treated with an ACE inhibitor
   - are euvolemic and clinically stable
   - have CHF in New York Heart Association (NYHA)[57] classes I-III (*level of evidence I*).

   Randomised clinical trials have shown that, when appropriately prescribed, long-term treatment with specific beta-blockers can lessen the symptoms of CHF, improve the clinical status of patients, enhance their sense of well-being, reduce admissions, and reduce mortality.[77]

   Beta-blockers are also known to have an additive effect with ACE inhibitors.[78, 79, 80]

5. Spironolactone should be considered for patients who:

   - are already being treated with diuretics, an ACE inhibitor and/or digoxin
   - are in NYHA classes III or IV and
   - have serum potassium <5.0 mmol/l and creatinine <0.22 mmol/l (*level of evidence I*).

   The addition of low doses of spironolactone (an aldosterone antagonist) to an ACE inhibitor has been shown to reduce the risk of death and hospitalisation in patients with NYHA class III or IV CHF.[81] Particular caution should be shown in the presence of renal impairment.

6. Digoxin should be prescribed for:

   - all patients with CHF and atrial fibrillation who need control of ventricular rate
   - patients with moderately severe symptomatic CHF (NYHA class III or IV) who:
     - remain symptomatic despite diuretic and ACE inhibitor therapy
     - have had a hospital admission for CHF and have poor left ventricular systolic function
   - patients with CHF, treated with a diuretic but unable to tolerate an ACE inhibitor or angiotension II receptor antagonist (*level of evidence I*).

   Randomised controlled trials and meta-analyses have shown that digoxin reduces the symptoms and signs of heart failure and improves exercise capacity when used alone or in combination with diuretics.[82]

   Digoxin toxicity may occur, particularly in the presence of impaired renal function. Low-dose digoxin (0.0625-0.125mg) therapy may be as effective as a higher dose.

7. Patients intolerant of ACE inhibitors due to cough should be considered for treatment with an angiotensin II receptor antagonist (*level of evidence I*).

8. Patients already treated with a diuretic and/or digoxin, who are intolerant of ACE inhibitors or angiotensin II receptor blockers, should be considered for combination therapy with hydralazine and isosorbide dinitrate (H-ISDN) (*level of evidence I*).
9. ACE inhibitors and beta-blockers should be titrated, where tolerated, to doses associated with benefit in randomised clinical trials.

Treatment of acute manifestations of CHF is detailed in Standard 4, Volume 2.

Continuing care of CHF *(Standard 7)*

- Non-pharmacological management of heart failure includes management of coronary risk factors as outlined above, including physical activity, weight management, smoking cessation and healthy eating. Vaccination of patients with CHF against influenza and pneumococcal infection is also recommended as patients with CHF are at increased risk of respiratory infection (*level of evidence II*).[49, 83] Research has demonstrated that immunisation against influenza may reduce admissions to hospital for CHF.
- Successful self-management depends upon appropriate patient and carer education and intensive support and follow-up services.[43, 68, 70] Patient education may start while the patient is in hospital and should be ongoing following discharge to reinforce essential information and enhance patients' capacity to manage aspects of their disease.
- Interventions that increase patients' and/or their carers' confidence in their ability to manage their own disease and make appropriate decisions have been shown to be more successful at improving patient outcomes and reducing the use of health services than interventions that merely provide patients with information but do not alter patients' perceptions of their capacity to manage their disease.[84, 85, 86] Useful interventions include a patient-initiated action plan previously agreed in collaboration with the doctor.

Cardiac rehabilitation *(Standard 8)*

Current evidence indicates that:

- Cardiac rehabilitation programs are effective in reducing cardiac risk and are safe (*level of evidence I*)
- Both hospital- and home-based physical activity programs should be provided (*level of evidence II*)
- The benefits of physical activity include positive effects on haemodynamics, functional capacity and wellbeing (*level of evidence II*)
- Physical activity programs help CHF patients in:
  - their recovery after discharge from hospital
  - making lifestyle adjustments and
  - alleviating anxiety and distress associated with their diagnosis (*level of evidence II*).
- Psychological problems such as social isolation and depression can negatively impact upon recovery of functional capacity and adherence to medications, lifestyle changes and exercise regimens (*level of evidence II*). Patients with anxiety and/or depression can benefit from professional counselling and/or group therapy (*level of evidence II*).

Palliative care *(Standard 9)*

- The importance of effective communication with the patient and the patient's family and carers about the expected course of the illness and final treatment options is strongly emphasised. Discussions regarding treatment preferences should cover responses to a potentially reversible exacerbation of CHF, a cardiac arrest, a sudden catastrophic event such as a severe cerebrovascular accident and worsening of major non-cardiac co-morbidities. If these matters have not been addressed in advance, forced contemplation of resuscitation options at the time of admission for worsening CHF may heighten patient and family anxieties without revealing true preferences.
- A large US study showed that patients hospitalised with CHF were more likely to opt for resuscitation in the event of a cardiopulmonary arrest than patients hospitalised with other chronic diseases. This finding may be related to the fact that patients with CHF are more likely than patients with other chronic diseases to have extended periods of stability with good quality of life after hospitalisation for intensive care.[87]

Monitoring of indicators *(Standard 10)*

Prior studies have shown that it is possible to make significant improvements in both process (eg use of ACE inhibitors) and outcome (eg rehospitalisation rate) measures in heart failure. In order to identify areas for change management and improvement, it is important to document key process and outcome indicators.

It is expected that the standards and requirements for demonstration of compliance outlined in this framework will direct service improvement for patients with CHF. Progress at an Area Health Service level will be monitored at regular six monthly intervals using a standardised reporting proforma on the demonstrations of compliance due for that particular six-month period.

At a statewide level monitoring of inpatient statistics relevant for people with heart failure will continue. It is acknowledged that if Area Health Services are successful in achieving the standards of the framework, with no corresponding increase in incidence of heart failure, there should be a reduction in inpatient utilisation.

Key performance indicators can play an important role in providing a useful benchmark at both a local and statewide level. Data standards (containing definitions of indicators and their numerators, denominators and values) need to be developed at the state level for the indicators in this framework.

3. Standards and demonstration of compliance for the prevention, diagnosis and management of CHF

The following table provides a summary of the evidence-based standards and requirements for demonstration of compliance for heart failure. These standards and the underpinning evidence are presented in more detail in Volume 2.

Standard 1: Prevention of CHF

Standard	*Demonstration of compliance*
1.1 **NSW Health and all Area Health Services** should ensure that all clinicians in NSW (whether employed by Area Health Services or not) are aware of current guidelines for the assessment and management of hypertension and other ischaemic heart disease risk factors.	**By December 2003**, the NSW Department of Health will ensure that the *NSW Clinical Service Framework for Heart Failure* is disseminated to all Area Health Services, Divisions of General Practice and Aboriginal Community Controlled Health Services for implementation across NSW.
1.2 **NSW Health and all Area Health Services** should coordinate programs for the general population that raise community awareness of hypertension and other risk factors for ischaemic heart disease and the need to assess and manage these risk factors. Particular attention should be given to groups within the population that are at high risk of ischaemic heart disease, including Aboriginal and Torres Strait Islander populations. People from culturally and linguistically diverse communities may also require special attention.	**By June 2004**, all Area Health Services will have health promotion programs that raise awareness of hypertension and other ischaemic heart disease risk factors and the need to assess and modify them. Programs will particularly target high-risk populations.
1.3 **NSW Health and all Area Health Services** should develop and implement population-wide policies to reduce hypertension and other ischaemic heart disease risk factors. To ensure appropriate reach to high-risk populations such as Aboriginal and Torres Strait Islanders, policies should be implemented through local Aboriginal Health Partnerships.	**By June 2004**, all Area Health Services will ensure that prevention policies and programs are in place in accordance with state and national public health strategies and population and settings based strategies for: – tobacco control – promotion of healthy eating – promotion of physical activity – reduction of overweight and obesity – safe alcohol use – mental health promotion. **By December 2003**, smoke free campus policies will be implemented in hospital areas in line with NSW Department of Health *Smoke Free Workplace Policy (1999)*.[88] **By June 2004**, all Area Health Services will have Smoking Cessation programs in place at all major hospitals, as per the NSW Department of Health *Guide for the management of nicotine dependent inpatients (2002)*.[89] **By March 2004**, 50% of admitted patients will be screened for smoking, referred to smoking cessation services or the Quitline (Tel: 131 848) and advised on nicotine replacement therapy or other pharmacotherapy for nicotine addiction. **By June 2004**, 100% of admitted patients will be screened for smoking, referred to smoking cessation services or the Quitline (Tel: 131 848) and advised on nicotine replacement therapy or other pharmacotherapy for nicotine addiction.

Standard 1: Prevention of CHF (continued)

Standard	*Demonstration of compliance*
1.4 NSW Health and all Area Health Services should ensure that services are available to the general population to detect and manage hypertension and other ischaemic heart disease risk factors according to current guidelines as outlined in the *NSW Clinical Service Framework for Heart Failure*.	**From March 2004**, and at regular intervals thereafter, Area Health Services will demonstrate ongoing compliance with the framework's recommended standards.
1.5 Clinicians should monitor and control hypertension and other ischaemic heart disease risk factors and detect and manage manifestations of ischaemic heart disease in people who have CHF, or are at elevated risk of CHF. Consideration should be given to psychosocial risk factors such as depression, social isolation or lack of social support and catastrophic life events. Their possible presence may be simply ascertained through specific questioning.	**By June 2004**, Area Health Services will ensure that protocols/procedures are in place in hospitals to consider the ischaemic heart disease profile (in particular the presence of hypertension, hypercholesterolaemia, diabetes, smoking, psychosocial risk factors) of all adult patients who are admitted to hospital.
1.6 NSW Health and all Area Health Services should ensure that secondary prevention services (eg continuing cardiac care programs such as cardiac rehabilitation) are available for people with coronary heart disease, in accordance with relevant guidelines, recommendations and policies.	**By December 2004**, Area Health Services will ensure that protocols/procedures are in place in hospitals for the provision of continuing cardiac care/cardiac rehabilitation for patients with coronary heart disease as per the Heart Foundation *Guideline for Prevention of Cardiovascular Events in those with known Coronary Heart Disease*[3], Heart Foundation recommendations for cardiac rehabilitation[90] and the NSW Department of Health's *NSW Policy Standards for Cardiac Rehabilitation*.[91]

Standard 2: Detection and management of factors that precipitate and exacerbate CHF

Standard	*Demonstration of compliance*
2.1 **All clinicians** should be aware of the factors that precipitate or exacerbate CHF and should seek to prevent, identify and treat precipitating factors in all patients who present with CHF or are at increased risk of CHF	**By December 2003**, the NSW Department of Health will ensure that the *NSW Clinical Service Framework for Heart Failure* is disseminated to all Area Health Services, Divisions of General Practice and Aboriginal Community Controlled Health Services for implementation across NSW. **By June 2004**, Area Health Services will ensure that all patients admitted to hospital with CHF have the factors that precipitated their CHF identified and recorded.
2.2 **NSW Health, Area Health Services and general practitioners** should promote immunisation against influenza and pneumococcal disease in all patients with CHF, with reference to NHMRC recommendations.	**By June 2004**, 100% of patients with CHF who are admitted or present to Emergency Departments will be informed about the benefits of influenza and pneumococcal vaccination. **By June 2004**, the Alliance of NSW Divisions will take steps to encourage evidence based opportunistic immunisation of adults including those with CHF as required by the *NSW Immunisation Strategy 2003-2006*.[92] **By June 2004**, Divisions of General Practice will encourage their member GPs to achieve the target outlined in the *NSW Immunisation Strategy 2003-2006* of 85% of people over 65 years being immunised against influenza.
2.3 **All Area Health Services** should ensure that all acute hospitals have intravenous fluid protocols that are designed to prevent, to monitor for early signs of and to correct fluid overload.	**By March 2004**, Area Health Services will ensure that all acute hospitals have intravenous fluid protocols in place.
2.4 **All medical practitioners** should be aware of the potential for certain medications to precipitate or exacerbate CHF. Practitioners should prescribe these medications, which include corticosteroids, non-steroidal anti-inflammatory medications and negative inotropic medications with due caution in patients who have or are at increased risk of CHF and should seek specialist advice where necessary.	**By December 2003**, the NSW Department of Health will ensure that the *NSW Clinical Service Framework for Heart Failure* is disseminated to all Area Health Services, Divisions of General Practice and Aboriginal Community Controlled Health Services for implementation across NSW.

Standard 3: Diagnosis of CHF

Standard	*Demonstration of compliance*
3.1 **Clinicians** should ensure that all patients suspected of having CHF undergo a comprehensive clinical assessment, with history, physical examination and diagnostic investigations.	**By June 2004**, clinicians will ensure that all patients suspected of having CHF have clinical assessment and that diagnostic investigations are performed and recorded, including electrocardiograph (ECG), chest x-ray, full blood count and serum biochemistry. All patients with diagnosed heart failure should have an echocardiogram performed.
3.2 **Clinicians** should consider the need for additional tests to be undertaken if the clinical assessment and diagnostic investigations indicate that they are necessary.	**By June 2004**, clinicians will ensure that appropriate additional diagnostic tests are performed and recorded if indicated by clinical assessment and preliminary diagnostic investigations. Additional tests may include serum iron and ferritin levels, thyroid function tests, viral studies, coronary angiography, haemodynamic measurements, endomyocardial biopsy, gated radionuclide angiocardiography and BNP or pro-BNP (when available).
3.3 **Clinicians** should assess disease severity in all patients who have manifestations of CHF.	**By June 2004**, clinicians will ensure that the exercise capacity of patients with CHF is assessed and recorded (eg using the New York Heart Association (NYHA) Classification of Heart Failure[57] or the Specific Activities Scale of Functional Capacity[58]).
3.4 **Clinicians** should discuss the diagnosis and its natural history with patients and family members and initiate a management program based on general advice and non-pharmacologic and pharmacologic measures.	**By June 2004**, the NSW Department of Health and Area Health Services will assist Divisions of General Practice in ensuring that general practitioners have access to the *NSW Clinical Service Framework for Heart Failure* and appropriate patient education material. **By June 2004**, Divisions of General Practice will encourage their member general practitioners to ensure that the diagnosis of heart failure is accompanied by discussion with patient and family members and that an appropriate management program is initiated based on general advice, non-pharmacologic and pharmacologic measures. This plan may be developed in collaboration with appropriate specialists and allied health providers.

Standard 4: Treatment of acute, life-threatening manifestations of CHF

Standard	*Demonstration of compliance*
4.1 **All Area Health Services** should ensure that Emergency Departments have protocols for the assessment and management of patients with acute heart failure.	**By June 2004**, Area Health Services will ensure that all Emergency Departments in NSW hospitals have protocols for the assessment and management of patients with acute heart failure.
4.2 **All Area Health Services** should ensure that mechanisms are in place to transfer patients with severe acute heart failure urgently to a tertiary referral centre for management, where indicated.	**By June 2004**, Area Health Services will ensure that mechanisms are in place across each Area to transfer patients with severe acute heart failure urgently to tertiary referral centres, where indicated.
4.3 **All Area Health Services** should ensure that patients with less severe heart failure who are assessed as being able to be discharged directly from Emergency Department after initial therapy receive an appropriate management plan.	**By June 2004,** Area Health Services will ensure that all patients discharged directly from Emergency Departments following treatment for less severe heart failure receive a management plan including expedited appointment with their general practitioner and specialist physician.

Standard 5: Pharmacological management of CHF

Standard	*Demonstration of compliance*
5.1 All patients with systolic heart failure should be prescribed an angiotensin converting enzyme (ACE) inhibitor in the absence of contra-indications.	**By June 2004**, clinicians will ensure that all patients with systolic heart failure are prescribed an ACE inhibitor in the absence of contra-indications. If not prescribed, contra-indications will be recorded.
5.2 All patients with systolic heart failure should be considered for approved beta-blocker therapy once signs and symptoms of fluid retention (if present) have been corrected and in the absence of contra-indications.	**By June 2004**, clinicians will ensure that at least 40% of patients with systolic heart failure who are euvolemic and with no contra-indications are prescribed an approved beta-blocker. **By June 2005**, clinicians will ensure that at least 60% of patients with systolic heart failure who are euvolemic and with no contra-indications are prescribed an approved beta-blocker.
5.3 All hospitals should have dosage titration schedules for ACE inhibitor and beta-blocker therapy and all patients with systolic heart failure discharged on ACE inhibitors and/or beta-blockers should be given a clear discharge plan that specifies for their community based doctor a suggested dosage titration schedule for these medications.	**By June 2004**, Area Health Services will ensure that titration schedules are available in hospital wards to assist in dose titration, and that all patients with systolic heart failure discharged on ACE inhibitors and/or beta-blockers are given a clear discharge plan that provides a suggested titration strategy to their community based doctor for these medications.

Standard 6: Multidisciplinary approach to CHF management

Standard	**Demonstration of compliance**
6.1 All CHF patients admitted to hospital should be referred to a cardiologist or physician for review and advice on management of their CHF and should have access to appropriate specialist review for complex co-morbidities.	**By June 2004**, Area Health Services will ensure that all CHF patients admitted to hospital are reviewed by a cardiologist or physician, and have access to specialist review for complex co-morbidities.
6.2 All CHF patients admitted to hospital should have access to allied health professionals including dietitian, pharmacy, physiotherapy, exercise physiology, social work, occupational therapy, psychology, cardiac rehabilitation services and other health providers as indicated.	**By June 2004**, all CHF patients admitted to hospital will have access to allied health professionals including dietitian, pharmacy, physiotherapy, exercise physiology, social work, occupational therapy, psychology, cardiac rehabilitation services and other health providers as indicated.
6.3 All CHF patients admitted to hospital should be assessed by a heart failure registered nurse specialist to ensure that heart failure education is initiated in hospital, and that coordinated management is continued on discharge from the hospital in liaison with general practice and community health services.	**By June 2004**, Area Health Services and clinicians will ensure that all patients admitted to hospital with CHF are assessed by a heart failure registered nurse specialist to ensure that heart failure education is initiated in hospital and that coordinated management is continued on discharge from hospital in liaison with general practice and community health services.

Standard 7: Continuing care of CHF

Standard	*Demonstration of compliance*
7.1 All clinicians treating patients with CHF should provide advice on non-pharmacological interventions in the control of CHF, and Area Health Services should provide specific programs designed to enhance the implementation of non-pharmacological interventions and to promote adherence to these interventions.	**By March 2004**, Area Health Services and clinicians will ensure that all patients with a diagnosis of CHF (and their family/carers where appropriate) receive education on specific non-pharmacological interventions to promote adherence.
7.2 All patients with CHF should have access to programs that equip and enable them and their carers to actively participate in self-management of their CHF following discharge. These ongoing programs should provide an action plan that covers self-management of important aspects of the disease, recognition of symptoms and signs that signal the need for professional attention and information on how to obtain this attention.	**By December 2003**, Area Health Services will ensure that all patients admitted with CHF are provided with a personal health record in which information relevant to their CHF management is recorded to assist with coordination of their care. (*My Health Record* has been developed and distributed to hospitals and general practitioners by the NSW Department of Health for use by patients with chronic conditions. Further copies are available from the Better Health Centre on (02) 9816 0452). **By June 2004**, Area Health Services will ensure that all CHF patients attending NSW hospitals have individually tailored programs that include education, comprehensive follow-up and clinical monitoring, with a self management action plan and information on when and how to obtain access to professional help.
7.3 All patients with CHF should have access to prompt advice from appropriate health professionals, including after-hours support and points of contact.	**By March 2004**, all Area Health Services will ensure that arrangements are in place for after-hours support and points of contact.
7.4 All Area Health Services should ensure that strategies are in place to facilitate effective communication and linkage between hospital and community based services for all patients with CHF.	**By June 2004**, Area Health Services will ensure that for all CHF patients discharged from hospitals in NSW: – Contact is made with their nominated medical attendant (usually their general practitioner) on the day of discharge either through a faxed discharge summary or telephone call – A management plan is provided as part of the discharge summary, giving details of ongoing management in the community, including follow-up appointments for a prompt initial post-discharge visit to the GP, and continuation of designated therapy, as well as dose titration schedules for ACE inhibitors and beta-blockers where prescribed.
7.5 All Area Health Services and clinicians caring for patients with CHF should ensure that mechanisms are in place to identify high-risk patients and to address their special needs.	**By June 2004**, all Area Health Services and clinicians caring for patients with CHF will establish mechanisms to identify high-risk patients and to address their special needs.

Standard 8: Rehabilitation

Standard	*Demonstration of compliance*
8.1 **All CHF patients** should have access to a comprehensive hospital or community based rehabilitation program that is individually tailored to their needs and part of an overall cardiac failure management program.	**By June 2005**, all Area Health Services will ensure that all CHF patients discharged from NSW hospitals have access to an individually tailored rehabilitation program that is linked with a comprehensive cardiac failure management program.

Standard 9: Palliative care for patients with end-stage heart failure

Standard	*Demonstration of compliance*
9.1 **All Area Health Services** should ensure that patients with intractable CHF have access to appropriate palliative care services.	**By June 2005**, all Area Health Services in NSW will provide access to palliative care services for patients with intractable CHF. **By June 2005**, palliative care services in each Area Health Service will have protocols in place for appropriate management of CHF patients.

Standard 10: Monitoring of quality and outcome indicators

Standard	*Demonstration of compliance*
10.1 **All Area Health Services** should ensure that strategies are in place to record and provide timely feedback on designated process and outcome indicators to improve quality of care.	**By June 2004**, all Area Health Services will establish mechanisms for recording process and outcome indicators, and providing timely feedback. The process measures will be based on the above standards, including ACE inhibitor and echocardiogram usage, discharge contact with GP; and the outcome measures* will include: – number of patients presenting to Emergency Departments with primary diagnosis of heart failure – number of patients admitted to hospital with primary diagnosis of heart failure – average length of stay of patients admitted to hospital with primary diagnosis of heart failure – number of patients readmitted to hospital following hospital discharge including total unplanned readmissions, heart failure readmissions, non-heart failure readmissions. **Until full implementation of the Unique Patient Identifiers (UPI) program, these outcome indicators are to be collected on an episode rather than a patient basis.*

4. Framework implementation strategy

Effective implementation of this framework will require the active engagement of all stakeholders including Area Health Service executives, clinicians, managers and service planners working in close liaison with the primary care sector. The involvement of patients and their carers as well as engagement of general practitioners in the implementation process are essential to success.

Clinical governance

Implementation of this framework will also require effective clinical governance. The key elements of clinical governance are:

- Recognition and acceptance by Area Health Service management of their responsibility for the quality of care delivered by the service and that this accountability is shared equally with the clinicians providing this care.
- Action by each Area Health Service to ensure that an effective system is in place to:
  - provide an environment that fosters quality
  - monitor and report regularly on the quality of care
  - minimise the risk of, identify and effectively address quality of care issues.

In practical terms this means that managers and clinicians have an equal responsibility for implementing this clinical service framework. This may involve establishment of a governance structure for implementation, or strengthening of an existing governance structure. Clinicians must play a major role in informing the system of improvements that are required and in participating in the improvement process. Managers must commit to acting upon the reasonable suggestions of clinicians for change and for developing the environment in which high quality care as identified in the standards, can be provided.

Prioritising initiatives

While the framework sets out clear standards and requirements for demonstration of compliance, it is recognised that there will be variability in the ease with which these requirements can be implemented across Area Health Services. Rural Area Health Services face specific challenges as a result of geography and resources, with factors such as access to specialist services, patient support, workforce issues and training being of particular concern. It is intended that the framework should allow for some variation in the strategies employed by Area Health Services in achieving the standards set depending on their different circumstances and requirements, while ensuring that standards of care are improved across NSW.

The models of care detailed in Volume 2 provide examples of the ways in which the standards can be flexibly applied to different geographical settings. It is expected that Area Health Services will work creatively in partnership with the other key stakeholders to:

- identify current gaps in provision of optimal care as described in the framework
- prioritise required initiatives
- develop local strategies for implementation of the initiatives.

NSW Chronic Care Collaborative

Drawing on the successes of the Priority Health Care Programs, the NSW Chronic Care Program's activities are now focusing on the use of Collaborative methodology to facilitate dissemination of its key effective initiatives statewide. This will facilitate implementation of the clinical service frameworks across NSW initially focusing on heart failure and chronic respiratory disease. Collaboratives are a proven change management methodology that have been used successfully in the UK[93], USA and Scandinavian countries.[94] The methodology is based on work initially conducted through the Institute for Healthcare Improvement (IHI) in the USA.[95]

The aim of a Collaborative is to identify, disseminate and facilitate uptake of best practice across multiple sites over a relatively short time frame, generally 12 months. The Collaborative methodology produces improvement by harnessing the collective wisdom of participants, an advisory panel of experts and a literature review to develop strategies to aid implementation of evidence-based best practice.

The success of Collaboratives requires change in an organisation's culture and infrastructure as well as specific changes in specialised areas. A diversity of individuals and groups are required to effectively adapt and implement these changes and it is important that the membership of Area Health Service Collaborative Teams reflects this. Senior executive support at the Area Health Service level is also crucial to the success of the Collaboratives.

It is proposed that the Collaborative methodology will be used to support implementation of key NSW Chronic Care Program initiatives including:

- Clinical Services Frameworks for respiratory disease and heart failure
- NSW Priority Health Care Programs with demonstrated effectiveness
- The patient-held record, *My Health Record*.

5. Assessing progress

The framework implementation plan is determined by the dates by which demonstrations of compliance are required. Progress at an Area Health Service level will be monitored at regular six monthly intervals using a standardised reporting proforma on the demonstrations of compliance due for that particular six-month period. This is important to demonstrate ongoing improvements in clinical outcomes and hence changes in care for people with heart failure.

Monitoring can indicate where modifications in our systems of care are needed to improve care provided to people with heart failure. The monitoring and reporting process is not intended to be onerous and definitely does not involve the establishment of comprehensive and costly IT systems where these do not exist. It is, however, about establishing quality improvement processes within available resources. For example, monitoring a standard may involve monitoring a selected sample of patients over a limited time period, rather than monitoring all patients attending that service. Establishing systems in this quality improvement way is a part of core business in providing the best care available for people with heart failure.

At a statewide level monitoring of inpatient statistics relevant for people with heart failure will continue. It is acknowledged that if Area Health Services are successful in achieving the standards of the framework, with no corresponding increase in incidence of heart failure, there should be a reduction in inpatient utilisation.

Also at a statewide level avoidable hospital admissions for patients with chronic illness including heart failure will be monitored through Ambulatory Care Sensitive Conditions (ACSCs). ACSCs include a range of conditions such as heart failure, angina, complications of diabetes, asthma and chronic obstructive pulmonary disease, for which hospitalisations may be avoidable if appropriate systems of care are in place. The systems of care should emphasise the importance of early detection and intervention and integrated and coordinated primary based health care.

The following table indicates the timeframes within which standards are to be met, giving some indication of the ongoing effort that will be required to achieve these. NSW Health and the Cardiovascular Clinical Expert Reference Group will provide ongoing support and advice to Area Health Services in relation to implementation of the frameworks.

Table 1: Summary of the timeframes for demonstration of compliance for each standard

Standards	2003	2004			2005
	By December	By March	By June	By December	By June
1: Prevention of CHF	1.1				
			1.2		
	1.3	1.3	1.3		
		1.4	1.4	1.4	1.4
			1.5		
				1.6	
2: Detection and management of factors that precipitate and exacerbate CHF	2.1		2.1		
			2.2		
		2.3			
	2.4				
3: Diagnosis of CHF			3.1		
			3.2		
			3.3		
			3.4		
4: Treatment of acute, life-threatening manifestations of CHF			4.1		
			4.2		
			4.3		
5: Pharmacological management of CHF			5.1		
			5.2		5.2
			5.3		
6: Multidisciplinary approach to CHF management			6.1		
			6.2		
			6.3		
7: Continuing care of CHF		7.1			
	7.2		7.2		
		7.3			
			7.4		
			7.5		
8: Rehabilitation					8.1
9: Palliative care for patients with end-stage heart failure					9.1
10: Monitoring of quality and outcome indicators			10.1		

6. Acknowledgments

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7. Glossary

Key	Definition
Angiotensin converting enzyme (ACE) inhibitors	A class of medications that reduces blood pressure and improves the function of the heart muscle by inhibiting the action of angiotensin (a hormone whose level is raised in heart failure).
Antiarrhythmic agents	Medications given to restore normal heart rhythm or prevent serious abnormal heart rhythms (arrhythmias)
Beta-blocker	A class of medications used to treat raised blood pressure and slow the heart rate by reducing the effect of adrenergic stimuli. Specific beta-blockers have been shown to have a beneficial outcome in heart failure. In Australia, carvedilol and bisoprolol are approved for this purpose.
Cardiac rehabilitation (CR)	Measures used to help cardiac patients maximise physical, psychological and social functioning to live productively and with confidence, and to assist and encourage behaviours likely to minimise the risk of further cardiac events and conditions. Services should include physical activity, health education and counselling programs tailored to meet the individual and cultural needs of the patient and their family. CR is commonly provided in an inpatient and group outpatient setting and increasingly includes home-based and outreach programs.
Chronic heart failure (CHF, heart failure, congestive heart failure)	For the purposes of this framework and unless otherwise specified, the term *heart failure* means chronic heart failure (CHF) and is a synonym for congestive heart failure. It includes: • systolic heart failure – an inability of the heart to pump properly, due to impairment of left ventricular function that leads to a fall in cardiac output • diastolic heart failure – an inability of the heart to relax and fill properly at normal filling pressures despite relatively normal ventricular contraction (also known as heart failure with preserved systolic function) • combined systolic and diastolic heart failure. CHF is due to impairment of the function of the ventricles of the heart. This may result from: • conditions that directly impair cardiac muscle function (eg myocardial infarction or cardiomyopathies) • conditions that cause pressure overload (eg aortic stenosis, chronic hypertension, acute elevation of blood pressure) • conditions that cause volume overload (eg mitral incompetence or fluid overload) • uncontrolled arrhythmias, either chronic or acute • diseases involving the pericardium.
Clinical service framework for CHF	A *clinical service framework* for CHF is a set of specifications defining (a) standards of clinical services for CHF that are expected to apply throughout NSW, and (b) models of care by which services that meet these standards can be delivered in the main settings in which patients with heart failure receive clinical care. These specifications cover: • the objectives of clinical services • the scope and organisation of services • best practice recommendations • indicators of process and outcome.

7. Glossary

Key	Definition
Coronary heart disease (coronary artery disease)	Narrowing or blockage of the coronary arteries by atheroma, leading to angina, coronary thrombosis or heart attack, heart failure, and/or sudden death.
Diastolic heart failure	An inability of the heart to fill properly at normal filling pressures despite normal ventricular contraction.
Diuretic	Medication which has the effect of increasing urinary flow, thereby reducing the amount of fluid in the body and reducing the blood volume.
Echocardiogram	An image and measurement of the heart structure and function obtained using ultrasound.
Electrocardiogram (ECG)	A recording of the heart's electrical activity obtained from electrodes positioned on the chest wall and limbs. An exercise (stress) ECG is taken before and during exercise (usually using a treadmill or stationary bicycle) to obtain objective and quantitative recording of myocardial ischaemia on exertion.
Enhanced Primary Care (EPC) Item	Medicare Benefits Schedule incentive for general practitioners to develop Care Plans for people of any age with chronic conditions.
Heart failure management plan	Under a heart failure management program, individualised heart failure management plans should be developed for patients with CHF. These should include the following components: • patient and carer education regarding their condition and its management, emphasising a self-management approach • provision of a personal health record and regular updating of the information it contains • discharge plan including appointments with general practitioner, specialist and other health professionals or organisations • provision of a Heart Failure Action Plan (see Appendix D) • home visit in the week following an episode of hospital based care for further discussion, education and review regarding pharmacological and non-pharmacological aspects of ongoing CHF care • early telephone follow up and continued telephone availability
Heart failure management program	A comprehensive multidisciplinary program generally involving a registered nurse coordinator, the patient, family, general practitioner, physician or cardiologist and other health professionals. The program provides a coordinated multidisciplinary approach to patient care across the continuum of care. Effective ongoing communication involving the patient, hospital and community based health professionals and associated services is a key element to ensure optimal care.
Heart failure registered nurse specialist	A registered nurse with interest and experience in the management of patients with chronic heart failure, who coordinates multidisciplinary care for individual patients.
Model of care for CHF	A description of the resources (people with particular skills, facilities, equipment, materials and infrastructure) that are needed to provide an organised system of care for a particular aspect of CHF patients' needs in a particular type of setting. For example, the framework includes a model of care for the management of an acute exacerbation of CHF, highlighting differences in the provision of care in metropolitan, urban, rural and remote settings. The formal description of a model of care comprises the following elements: • explicit objectives • a description of how services are organised to achieve the objectives, what resources and services are available (including facilities, expertise and materials) and how patients get into and out of the services • a description of how services are delivered (linked to evidence-based guidelines and care plans).

Key	Definition
Percutaneous transluminal coronary angioplasty (PTCA, angioplasty)	Angioplasty of the coronary arteries ie the introduction of a balloon on a catheter through the skin (percutaneous), into a blood vessel (transluminal) and into the coronary arteries to widen them.
Personal health record	A patient-held record which provides patients with regularly updated information regarding their disease and its ongoing management, and provides immediate access by all appropriate health service providers to key information such as diagnostic test results, current medication regimens and treatment plans, emergency contact details and other relevant information. NSW Health has developed and distributed copies of a personal health record to general practitioners and to Area coordinators of the Chronic and Complex Care Programs, for use by patients with chronic and complex conditions including CHF. *My Health Record* is in a folder format that can be adapted to the specific needs of CHF patients for coordination of their care, and can be updated throughout periods of care. Copies of *My Health Record* are available from the Better Health Centre on (02) 9816 0452.
Primary prevention	The prevention of the development of a condition (eg CHF), by avoidance or treatment of factors known to contribute to its development (eg smoking, hypertension).
Secondary prevention	Interventions such as lifestyle changes or medications aimed at slowing or reversing the progression of disease (eg CHF) once it is present.
Self-management	Assistance and empowerment of patients with CHF to monitor and manage aspects of their disease through patient education, ongoing multidisciplinary support and development of individualised action plans. Patient education may start while the patient is in hospital and should continue in the community to reinforce essential information and enhance patients' capacity to manage their disease. Aspects of CHF care in which patient self-management is beneficial include: • adherence to medication regimens, lifestyle modifications and physical activity programs • daily weighing to monitor for sudden weight gain • monitoring of warning signs of worsening of their condition, including shortness of breath, peripheral oedema and ascites • seeking medical attention promptly in the event of sudden weight gain, warning signs or changes in status of their condition.
Statins	A class of medications used to treat raised blood cholesterol and reduce the risk of coronary heart disease.
Systolic heart failure	An inability of the heart to pump properly, due to impairment of left ventricular function that leads to a fall in cardiac output.
Tertiary referral centre	A major hospital facility providing open-heart surgery and PTCA, which receives referrals from both primary and secondary care.

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Appendix A

Designation of levels of evidence as defined by the National Health and Medical Research Council[96, 97]

Level	Explanation
I	Evidence obtained from a systematic review of all relevant randomised controlled trials.
II	Evidence obtained from at least one properly designed randomised controlled trial.
III	Evidence obtained from any of the following: – well-designed pseudo-randomised controlled trials (alternate allocation or some other method) – comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group. – comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group.
IV	Evidence obtained from case series, either post-test or pre-test and post test.
Expert opinion (EO)	Opinions of respected authorities based on clinical experience, descriptive studies or reports of expert committees.

Note: The classification of levels of evidence described above correspond to those applied in the *Guidelines on the Contemporary Management of the Patient with Chronic Heart Failure in Australia*.[1] They are based on a classification published by the NHMRC[96] and are consistent with a more detailed, updated classification published subsequently.[97]

Appendix B

Psychosocial risk factors and coronary heart disease

The National Heart Foundation of Australia recently convened an Expert Working Party to review the systematic reviews of the evidence regarding links between psychosocial risk factors and coronary heart disease (CHD).[56] The review's conclusions are summarised as follows:

- Depression, social isolation and lack of social support are significant risk factors for CHD that are independent of conventional risk factors such as smoking, hypercholesterolaemia and hypertension and are of similar magnitude to these conventional risk factors.
- Acute life-event "stressors" can trigger coronary events.
- Absolute risk of CHD depends upon the strength and number of risk factors. However, a substantial proportion of the variation of CHD incidence between populations is not explained by conventional risk factors, and those factors clearly identified in this review – depression, social isolation and lack of social support – may explain some of the variance in CHD occurrences. These risk factors should be considered in the development of future risk assessment tools.
- Psychosocial risk factors may cluster together in a similar way to conventional risk factors. Psychosocial and conventional risk factors often coexist (eg patients with depression are more likely to smoke and be physically inactive).
- Depression is common and is clearly a risk factor for CHD. It can be easily identified and treated. As yet, there are no published studies of whether treatment of depression will reduce CHD morbidity.
- Depression and CHD frequently coexist. Patients with CHD should be assessed for depression and patients with depression should be assessed for CHD risk factors.
- In patients with CHD, the presence of depression is more likely to lead to poorer outcomes. They may need more assertive management of their conventional risk factors and attention to the extent to which depression is affecting their adherence to treatments and lifestyle modifications.
- Social disadvantage is strongly associated with both adverse psychosocial and conventional risk factor status. In Australia, particular at-risk groups include Aboriginal and Torres Strait Islander peoples, people with depression and anxiety disorder, and migrants. There is a need for research to investigate the extent to which CHD rates in populations might be influenced by adverse social and cultural factors.
- Until this time, public health approaches to CHD have focused largely on modification of conventional risk factors. There is a need to consider the burden imposed by these additional CHD risk factors. Attention to these psychosocial factors may also improve outcomes in CHD patients. *(from Bunker SJ et al, 2003)*

Appendix C

Co-chairs and Members of the Cardiovascular Clinical Expert Reference Group

Co-chairs		
Professor Geoffrey Tofler	Professor of Cardiology	Royal North Shore Hospital
Dr Ana Singer	GP Director	South Eastern Division of General Practice
Members		
A/Prof Stephen Colagiuri	Director, Endocrinology Department	Prince of Wales Hospital
Dr John Cullen	Clinical Director, General, Geriatric & Rehab Medicine	Concord Repatriation General Hospital
Ms Trish Davidson	Clinical Nurse Consultant	St George Hospital
Ms Shannon Doughty	Physiotherapy Adviser	Moruya Hospital
A/Prof Karen Duggan	Hypertension Diagnostic Service	Bankstown-Lidcombe Hospital
Mr Peter Edwards	Consumer Representative, Cardiovascular Disease Expert Advisory Group & Illawarra Stroke Unit Project	Primbee NSW 2502
Ms Kerrie Goldston	Program Manager, Secondary Prevention	National Heart Foundation of Australia (NSW Division)
Dr Suzanne Hodgkinson	Director, Department of Neurology	Liverpool Hospital
A/Prof Peter Macdonald	Cardiologist	St Vincents Hospital
Dr Brian Morton	General Practitioner	Willoughby NSW
Prof Andrew Sindone	Cardiologist	Concord Repatriation General Hospital
Dr Elizabeth Swinburn	Director, Emergency Department	Mona Vale Hospital

Membership of Cardiovascular Special Interest Group

In addition to the Co-chairs and Members of the Cardiovascular Clinical Reference Group, the Cardiovascular Special Interest Group included the following:

Anderson, Ms Melanie	Clinical Nurse Consultant, St George Hospital
Aplin, Ms Karen	Central Sydney AHS
Bardsley, Ms Kimberley	Heart Failure CNC, Cardiac Chronic and Complex Care Priority Health Care Project, St. Vincent's Hospital
Bennett, Ms Sasha	Pharmacist, Cardiac Chronic and Complex Care Priority Health Care Project, St. Vincent's Hospital
Buggy, Ms Elaine	Wentworth AHS
Candlish, Ms Paula	Cardiac Liaison Nurse, Chronic Disease Management Project, Hunter AHS
Chan, Ms Stela	South Eastern Sydney AHS
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Denbesten, Ms Lynda	CNC, Cardiac Services, Central Coast AHS
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Harris, Ms Caroline	Aboriginal Vascular Health Program Manager, Division of Population Health and Planning
Harvey, Ms Jo Ann	South Western Sydney AHS
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Hildritch, Ms Jukie	Illawarra AHS
Holland, Ms Judy	Physiotherapist, Hunter AHS
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