PHCM9129
Prevention and
Management of
Chronic Disease

Module 3

Chronic disease management

Basic concepts

This section provides an overview of the management of common chronic diseases – type 2 diabetes, cardiovascular disease, and chronic respiratory disease, their physiological risk factors (obesity, smoking, hypertension, high cholesterol and pre-diabetes) and how the care of patients with these conditions is organised.

Learning objectives

By the end of this section you will be able to:

- Describe the management of patients with common chronic diseases and their physiological risk factors in primary health care
- Describe the organisation of their care in the community.

3.1 Principles of chronic disease management

Effective chronic diseases management relies on opportunistic case finding for assessment of risk factors, detection of early disease, and identification of high-risk status; both pharmacological and behavioural interventions, and long-term follow-up [1]. WHO has identified the following as important steps in the management of chronic disease [2]:

1. Develop a treatment partnership with the patient
2. Focus on the patient's concerns and priorities
3. Deliver care across the 5As: Assess, Advise, Agree, Assist and Arrange
4. Support patient self-management
5. Organise proactive follow-up
6. Involve "expert patients," peer educators and support staff
7. Link the patient to community-based resources and support
8. Use written information registers, treatment plan, treatment cards and written information for patients to document, monitor and remind
9. Work as a clinical team
10. Assure continuity of care.

3.2 Early management of hypertension, dyslipidaemia and heart failure

The goals of management of cardiovascular disease are to prevent complications (e.g. kidney disease), further events (myocardial infarction or stroke), and improve functioning and quality of life.

Absolute risk

Absolute CVD risk is the probability that an individual will develop a cardiovascular event (coronary infarct or stroke) within a period of time (usually 5 to 10 years) [3]. It is based on an algorithm derived from longitudinal cohort studies (such as The Framingham Heart Study) and combines information on age, gender, smoking status, diabetes status, blood pressure and lipid (cholesterol) levels. Preventive treatment decisions (such as whether to prescribe a drug) based on estimated absolute risk are more effective and efficient than those based on single risk factors.

The uptake and short-term use of cardiovascular absolute risk (CVAR) assessment by Australian GPs has been variable [4-7]. Many GPs use CVAR assessment in their practice primarily to motivate patients to change their behaviour and adhere to management rather than to inform their own decisions about pharmacotherapy or referral. Time and practice capacity are barriers to its greater use. Patients with sustained behaviour change following CVAR assessment had internalised the benefits to their health and received support from family and friends; those who relapsed attributed this to their own lack of motivation and extrinsic factors [8].

Hypertension

Blood pressure, in the general population, is considered abnormal if it is persistently greater than or equal to 140/90 [9]. However, the risk from blood pressure is continuous and lower levels may be required in patients at higher risk (e.g. those with diabetes). The goal of management is to reduce complications including the risk of heart and kidney disease and stroke. All patients at risk should receive lifestyle interventions to stop smoking, increase physical activity, reduce dietary salt and reduce weight. Pharmacotherapy should be offered to patients at high absolute risk. Patients with hypertension should be monitored regularly to review absolute risk, side effects and adherence with treatment and to detect renal disease.

Dyslipidaemia ("high cholesterol")

Patients at increased cardiovascular risk should be offered lifestyle interventions to reduce their risk, for example, to stop smoking, to have a diet that is low in saturated fats and/or to increase physical activity. Those at persistently high risk should be offered pharmacological interventions aiming to achieve target levels of lipids [10] (LDL<2.0 mmol/l, HDL>1.0 mmol/l and TG<1.5 mmol/l). Patients should be monitored regularly to review absolute risk, adherence and possible side-effects of treatment.

Heart failure

Heart failure is a complex clinical syndrome that impairs the ability of the left ventricle of the heart to fill with or eject blood, particularly during physical activity [11]. Symptoms of heart failure (e.g. dyspnoea, fatigue) can occur at rest or during physical activity. Diagnosis is based on clinical features, chest X-ray and echocardiography (which should be conducted in all cases). The goals of management are to improve left ventricular function, relieve symptoms and improve quality of life, slow disease progress and prolong survival, improve physical activity tolerance and reduce hospital admissions. Management usually includes a number of medications, increasing physical activity, salt restriction and weight management and avoiding too much fluids. This requires a multidisciplinary approach.

A systematic review shows that delivering multidisciplinary interventions in the community to patients with heart failure reduces hospital admissions [12]. The elements of these include [13]:

- involvement of health professionals and other providers from a range of disciplines using a team approach across healthcare sectors
- implementation of evidence-based management guidelines, including systems for optimisation of pharmacological and non-pharmacological therapy
- inclusion of patients and their families in negotiating the aims and goals of care
- development and implementation of individualised management plans
- promotion of and support for self-care (e.g. taking medicines; following lifestyle-management advice about smoking cessation, physical activity and exercise programs, nutrition and limiting alcohol use; and monitoring and interpreting symptoms) as appropriate to patients' needs, capacities and preferences

- the use of behavioural strategies to support patients in modifying risk factors and adhering to their management plans
- continuity of care across healthcare services, including acute care, primary care and community care
- monitoring of program outcomes and systems to ensure continuous quality improvement.

Atrial Fibrillation

Atrial fibrillation is an electrical disturbance of the heart that increases the risk of stroke (due to clots from the heart to the brain) and heart failure. It may not have any symptoms or may cause intermittent palpitations (racing heartbeat). The prevalence increases with age, affecting 5% of people 65 years and increasing to 10% in those over 80 years [14]. It may have no cause, or it may be associated with hypertension, coronary heart disease or heart valve disease. Most people with atrial fibrillation require medication to prevent clotting. Many also require medication to slow the heart rate or treat abnormal heart rhythms. As with other forms of heart disease, a healthy diet, physical activity, not smoking and drinking in moderation are important. Patients may self-monitor their heart rhythms especially if they get symptoms and need to know when to seek urgent medical help.

3.3 Management of pre-diabetes and type 2 diabetes

Diabetes risk

People can be screened for diabetes risk using a questionnaire derived from population cohort studies. In Australia the AUSDRISK questionnaire gives a score that grades risk of diabetes [15, 16]. Those at high risk (score of 15+) have a one in seven risk of diabetes. This can be used to identify patients with diabetes or impaired glucose metabolism for whom lifestyle interventions can be offered to prevent onset of diabetes. Only one study has been conducted on the usage rate of AUSDRISK by general practitioners (GPs) in clinical practice finding that only 36% were aware of AUSDRISK [17].

Type 2 diabetes

Type 2 diabetes is a chronic progressive disease with potentially serious complications including blindness, renal failure, lower extremity amputations and premature death. Its prevalence in Australia has been recently reported as approximately 7% [18]. It is the primary result of insulin resistance in muscle, fat and liver with or without secondary failure of the pancreas to secrete enough insulin. It is diagnosed on the basis of fasting glucose or an HbA1c test. The primary goals of management are to control blood glucose, blood pressure, lipids and weight and to detect and manage complications early especially renal disease, neuropathy, foot conditions and eye disease.

Treatment includes diet and physical activity in order to achieve optimal glucose and weight control. Most patients require pharmacotherapy including oral glucose

lowering drugs (such as Metformin) with or without insulin. Insulin pharmacotherapy is more likely to be required in patients with longer duration of diabetes. Patients on insulin require more careful monitoring of their glucose levels. Control of blood pressure is very important and ACEi or ARB drugs are preferred because of their "kidney sparing" effects.

Regular monitoring of diabetes is essential in order to achieve optimal control and prevent complications. It includes monitoring of:

- Smoking, nutrition, alcohol and physical activity (SNAP) behaviours and weight
- Glucose control using regular testing of HbA1c +/- home glucose testing
- Blood pressure
- Blood lipids
- Kidney function – urinary albumin
- Retina of eyes
- Sensory nerve damage (neuropathy), skin and circulation of feet.

These are included in the annual cycle of care that patients should complete. In addition to monitoring this involves review of self-care and medication adherence and possible side-effects of treatment. Patients have an active role in monitoring and self-management of their condition and require adequate information and skills to do this.

Diabetes care is best provided by a multi-disciplinary patient care team [19]. However, there has been ongoing debate about the role of specialist and generalist providers and services. In 1994, a Royal College of General Practitioners Occasional Paper was published which drew on the findings from five randomised trials, five non-randomised trials and 14 descriptive accounts of shared diabetes care [20]. In 1997, a Cochrane review that described a meta-analysis of the same five randomised trials was published [21]. These concluded that systematic care involving a register, protected time for diabetes care, a practice nurse with some diabetes experience, a written management and education protocol agreed with the local consultant diabetologist, and a system for auditing standards of care can achieve standards of care as good as or better than hospital outpatient care, at least in the short term. A study in Danish general practice demonstrated that the long-term control of diabetes could be improved through a variety of educational interventions, prompts for the doctors to offer structured care (such as regular clinical assessments or laboratory tests during planned quarterly consultations) [22]. These enabled patients and doctors to set and review treatment goals aimed at reducing cardiovascular risk. More recently the American Diabetes Association recommended that care systems support team-based care, community involvement, patient registries, and decision-support tools to meet patient needs [23].

Self-management is a key element of effective diabetes care (see Section 5). Based on a systematic review and meta-analysis of 17 randomised controlled trials, the US Community Preventive Services Task Force recommends intensive lifestyle interventions, for patients with T2D, supported by individual and group counselling to help them change their diet or level of physical activity [24]. This may be delivered by telephone or the internet.

3.4 Management of asthma and chronic obstructive pulmonary disease

Asthma

Asthma is a chronic inflammatory disorder of the airways with swelling and spasm of the muscles in small airways causing wheezing and shortness of breath. It occurs in episodes after which lung function returns to normal. The prevalence of asthma is relatively high affecting 1 in 6 children and 1 in 9 adults.

In adults and older children, it is usually diagnosed using spirometry to measure lung function before and after use of a bronchodilator. It is classified as intermittent or mild, moderate or severe persistent based on symptoms, lung function and response to therapy. Treatment for all patients includes use of reliever medication (such a short-acting B-adrenergic SABA drug). Treatment with a preventer medication (such as inhaled steroids) is recommended for patients who have asthma symptoms or use SABA more than three times per week. Therapy should be tailored to severity of asthma. Ongoing assessment includes monitoring frequency of symptoms, frequency of reliever use and spirometry or other lung function tests. Preventive measures include avoiding triggers and immunising against common respiratory infections such as influenza.

This care requires a high degree of patient and/or carer involvement and skill, and patient self-management education is a key component of effective care. Gibson *et al* conducted a systematic review which found that a model of care incorporating self-monitoring, regular medical review and a written action plan, improved many patient outcomes including hospitalisations, unscheduled visits to the doctors, days off work/study and nocturnal asthma [25].

Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a progressive disease that is caused by narrowing of the airways in the lungs. Unlike asthma this obstruction is not reversible. Early diagnosis and prompt management of exacerbations of COPD may prevent progressive functional deterioration and reduce hospital admissions. Cigarette smoking is the leading cause of COPD.

Diagnosis and assessment of severity is largely based on spirometry. COPD can be graded as mild, moderate and severe. Management includes, smoking cessation, influenza and pneumococcal vaccination and use of bronchodilators. Pulmonary rehabilitation has been shown to benefit people with symptomatic COPD. It is usually conducted by a physiotherapist and involves exercise training, education, nutritional intervention and psychosocial support. Home oxygen therapy can prolong survival in patients who have persistently low blood oxygen levels.

Patients with COPD require regular review of their lung function (using spirometry), medications, therapy and quality of life. Patients and their families need to be educated and supported to deal with the condition and its physical and psychological impact. This includes recognising and responding to exacerbations of the disease.

Clinical practice guidelines for COPD care have been developed in both Australia and other countries. The evidence of benefit is clear for smoking cessation. Planned

multidisciplinary care is recommended and has been shown in a limited number of studies to improve care and reduce hospitalisation [26].

3.5 Management of chronic musculoskeletal conditions

Arthritis is inflammation of the joints (although other elements of the musculoskeletal system can also be affected, especially the bones and ligaments). The most common arthritis is osteoarthritis affecting 8% of Australians [27]. Osteoarthritis is a degenerative joint condition usually affecting large joints such as the hips, knees and ankles as well as the hands and spine. The goals of management of osteoarthritis are to control pain, minimise joint damage, and improve or maintain function and quality of life [28]. The management may include medications (such as non-steroidal anti-inflammatory drugs), behavioural interventions and self-management education, physical therapy, use of splints or walking aids, weight management and surgery (joint replacement). In Australia this may involve the development of a care plan and a team-care arrangement to facilitate multidisciplinary allied health care for patients.

3.6 Management of cancer as a chronic condition

The most common cancers affecting males are prostate, colorectal, melanoma, lung, head and neck cancers. For females, the most common cancers are breast cancer, colorectal, melanoma, lung and uterine cancers [23]. The prevalence of particular cancers varies with age.

Risk factors for cancer include smoking, alcohol consumption, poor diet, obesity and physical inactivity. They also include genetics, family history, occupational exposure, sunlight, radiation, environmental pollution, reproductive factors and past medical treatment (Figure 1). In Australia there are screening programs for the early detection of breast, cervical, prostate and colorectal cancer.

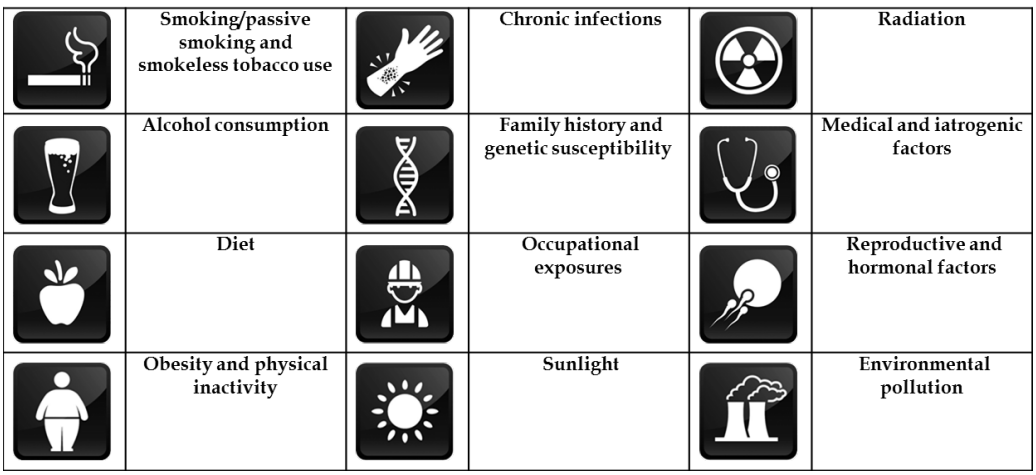


Figure 1: Risk factors for cancer (AIHW)

Australian survival rates for cancer are high by world standards. All cancer survival from time of diagnosis has increased significantly from 48% in 1984-88 to 69% in 2010-14 [29].

	Males	Females	
Prostate	95%	91%	Breast
Colorectal	70%	70%	Colorectal
Melanoma of the skin	89%	94%	Melanoma of the skin
Lung	15%	21%	Lung
Head and neck cancer	70%	83%	Uterus
Lymphoma	75%	77%	Lymphoma
Leukaemia	63%	98%	Thyroid
Kidney	77%	9.9%	Pancreas
Bladder	56%	61%	Leukaemia
Liver	19%	46%	Ovary

Figure 2: Five-year relative survival for the 10 most commonly diagnosed cancers, by sex, 2011–2015 (AIHW Australian Cancer Database 2015)

With the increasing survival, patients are living with cancer as a chronic disease. This means coping with not only the risk of recurrence but the long-term side effects of treatment. This is becoming an increasing role not only for specialist services but also primary health care. Many of the principles of chronic disease management can be applied to the long-term management of cancer.

3.7 Mental illness

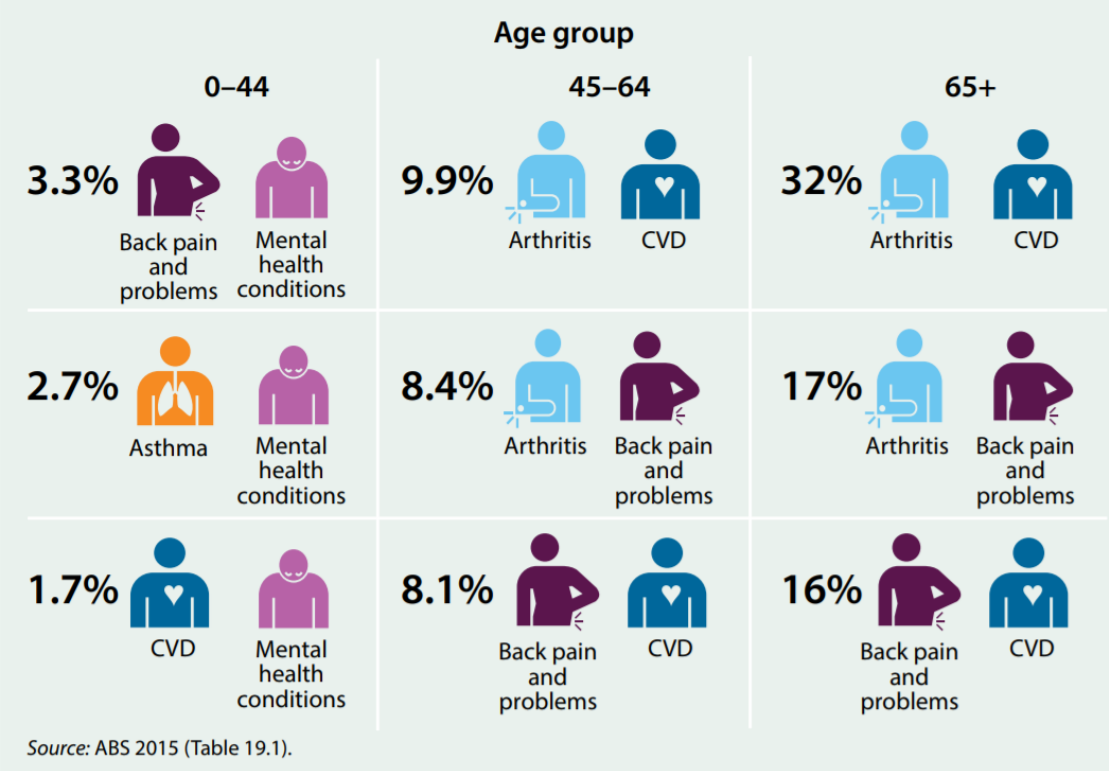
One in five (20%) Australians aged 16-85 years experience mental disorders in a 12-month period. However, of those with a mental disorder only one third used health services for mental health problems (2007 National Survey of Mental Health and Wellbeing). 0.5% of the population suffer from psychotic illness (47% of which is schizophrenia) [30]. Chronic physical illness is a risk factor for mental illness. This may be mediated by physiological factors such as inflammation or by psychosocial factors. Interventions for people with mental illness include medications, cognitive and behavioural interventions and supportive care. These are designed to improve quality of life and reduce suicidality.

There are a number of different models of integration of mental illness care in primary health care. These include early intervention especially with young people at risk of suicide or psychosis, improved referral access to psychological services, collaborative-care teams involving mental health providers with primary care providers, shared-care arrangements between mental health services and primary care and stepped care (in which access to specialist care is tailored to the level of need - ‘at risk’, mild, moderate or severe/complex).

3.8 Multi-morbidity

Many Australians suffer from multiple long-term conditions. In 2008, 75% of Australians had a long-term condition and 50% of people aged 65 and older reported having five or more [31]. Table 1 shows the co-existence of morbidities in the Australian population. Physical and emotional health problems frequently co-exist in primary care [32]. This increases the burden on providers as more complex problems are being managed in patient encounters [33].

Table 1: Common Most common comorbidities of selected chronic diseases, by age, 2014–15 [34]



Multi-morbidity may present as a collection of long-term conditions that share common risk factors (e.g. SNAP behavioural risk factors) such as COPD and cardiovascular disease as a result of smoking or when one condition leads to another complication such as diabetes and cardiovascular disease (Figure 3).

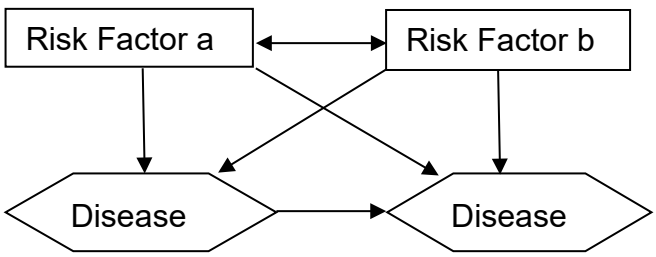


Figure 3: Associations and interactions between risk factors and diseases (Adapted from Valdaras et al 2009 [35])

The management of multi-morbidity is complex. Current guidelines tend to provide evidence-based recommendations for care of single conditions. The risk factors for these conditions and management can overlap and sometimes confound each other. Patients with multi-morbidity may have underlying social problems or disadvantage that might need to be addressed as part of management. The management of multi-morbidity often involves a range of different specialised services and patients can find it difficult to self-manage across these conditions.

Care for patients with multi-morbidity should aim to be responsive to the patient's own concerns, with patients being actively involved in the setting of their goals and priorities [36]. This includes involvement of patients in shared decision making about the goals of their care and management plans, building cohesive and integrated patient care teams involving multiple providers across multiple services with more integrated care pathways and guidelines for common combinations conditions and development of multidisciplinary care plans that identify providers and their roles in the care of individual patients.

Patient Reported Outcome Measures (PROMs) are structured questionnaire-based tools that monitor the impact on quality of life or health status. They include more general quality of life measures such as the SF12 or EQ-5D-5L. They also include measures tailored to specific condition. There is some evidence that these can facilitate patient-centred care [37]. However, their adoption in practice has been limited in Australian primary health care partly because of time and availability in medical records systems. Also, their use may be constrained for some people with limited literacy or health literacy. It is important to consider these factors when choosing a PROM [38].

Learning Activity 1

Look at the ACI site on Patient Reported Outcome Measures and Patient Experience Measures
https://www.aci.health.nsw.gov.au/make-it-happen/prms/about-patient-reported-measures

How would you go about selecting a PROM for Aboriginal patients with diabetes?

Learning Activity 2

Look at the case study on diabetes on the WHO website:
http://www.who.int/features/galleries/chronic_diseases/zahida/01_en.html

What aspects of systematic care are needed in this patient's management?

Suggested further reading

Diabetes Australia website http://www.diabetesaustralia.com.au/

Lung Foundation Australia website http://lungfoundation.com.au/

National Heart Foundation Website
https://heartfoundation.org.au/for-professionals

National Asthma Council of Australia Website
http://www.nationalasthma.org.au/

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