2 Background

Note: the term 'medicine' includes prescription, non-prescription and complementary medicines.

Medicines can save lives, help people stay healthy, relieve symptoms of disease, cure some diseases and improve quality of life. They are a part of most people's lives. In 1995, almost six in ten Australians took at least one medicine over a two week period, one in four took vitamins or minerals and one in ten used herbal remedies (ABS 1999). The use of medicines increases with age—86% of people aged 65 years and over take medicines, and over 75% of these take more than one medicine.

Australians spent $10.9 billion on medicines in 2004–05, including $7.1 billion on subsidised pharmaceuticals and $3.8 billion on other prescription, over-the-counter and complementary medicines (AIHW 2006b). Expenditure on pharmaceuticals grew by an average 8.9% per year between 1994–95 and 2004–05, and accounted for 13% of total recurrent health expenditure in 2004–05.

Medicines also have associated risks. There can be side effects and mistakes made in the prescribing, administration, dispensing or management of medicines. For the individual, the risk increases with the number of medicines taken. At the community level, the risk of errors increases with the volume of medicine use. Medicine problems can be related to over-use, under-use, misuse or adverse events.

2.1 Quality use of medicines

Australia began developing policies to ensure that essential, affordable medicines of acceptable quality, safety and efficacy were available as early as the 1950s. By the 1990s a comprehensive policy was in place and in December 1999 a formal policy document entitled Australia's National Medicines Policy was launched, with the following interdependent objectives:

- timely access to the medicines that Australians need, at a cost individuals and the community can afford
- medicines meeting appropriate standards of quality, safety and efficacy
- quality use of medicines
- maintaining a responsible and viable medicines industry (DHAC 1999).

In 2002 the National Strategy for Quality Use of Medicines was put in place as part of the National Medicines Policy. Quality use of medicines (also known as 'rational use of medicines') means:

- selecting management options wisely considering the place of medicines in treating illness and maintaining health, and recognising that there may be better ways to manage disorders than using medicines
- choosing suitable medicines if a medicine is considered necessary, taking into account the individual patient, clinical condition, risks and benefits, dose and length of treatment, any coexisting conditions, other therapies, monitoring considerations, and costs for the individual, the community and the health system

- using medicines safely and effectively by monitoring outcomes; minimising misuse, over-use and under-use; and improving the ability to solve any problems related to medicines (DoHA 2002).

This definition of quality use of medicines applies equally to decisions about use of medicines by individuals and by the population as a whole.

National bodies with a key role in promoting and ensuring quality use of medicines are described briefly in the Appendix.

Performance indicators to monitor the implementation and effect of the National Strategy for Quality Use of Medicines have been developed (DoHA 2003a). There have been improvements in the adoption of some practices supporting quality use of medicines, as measured by these indicators (DoHA 2003b).

2.2 Opportunities and challenges for quality use of medicines

The management of cardiovascular disease can be regarded as having three phases:

1. Prevention is usually done by general practitioners (GPs) in the community to identify and help people at risk before disease symptoms appear or a cardiovascular event occurs. Once a person has been assessed as at risk of cardiovascular disease, doctors may prescribe medicines, lifestyle changes or both.

2. Treatment during an acute event, such as a heart attack or stroke, typically happens in hospital.

3. Treatment and ongoing prevention after an acute event occur mainly in the community, involving GPs, nurses, rehabilitation health professionals and pharmacists.

At each phase there are opportunities and challenges for practising quality use of medicines, involving multiple stakeholders: health care consumers, carers and the general community; health practitioners and health educators; health and aged care facilities; medicines industry, media, health care funders and purchasers; and governments.

Some of the problems that may arise include:

- GPs, nurses and pharmacists unable to keep up to date with evidence for the best treatment options, especially if a patient is taking several medicines

- GPs lacking skills or resources, which often involve starting patients on a low dose of medicine and then slowly increasing the dose to therapeutic strength, and monitoring the medicine's effects

- specialist physicians focussing on their own disease area, not considering the patient as a whole with any coexisting health conditions and other medicines they may be taking

- poor communication between doctors and patients, leading to: patients not understanding the risks, their condition, treatment and desired outcomes; coexisting health conditions not considered; medicines taken for other health problems and complementary medicines not discussed and considered; increasing the risk of interactions and adverse events

- patients unable to take in and remember information on medicines given to them by health professionals

- patients not knowing what medications they are taking and why. This is a problem particularly for older people who may take several medicines for different coexisting health conditions and may use a form of dose aid, or where medicine brands are substituted

- patients refusing to continue treatment as they do not understand that initially doctors may need to change doses to find a form that is well tolerated and effective

- patients not understanding the importance of monitoring effects of medicines, such as warfarin and diuretics, putting themselves at risk of drug-adverse events

- patients not taking medicines because they forget to do so, or cannot afford medicines or visits to the doctor (see also Section 5.2 Concordance with medicines, later in this report)

- patients not taking medicines because they do not understand that their condition is chronic and has not been 'cured'; for instance for conditions such as hypertension where the doctor has told the patient that their blood pressure is controlled. Patients often misconstrue this as meaning that they can stop taking their medicines.

- patients hoarding medicines when the safety net threshold is reached (see Box 1 in Chapter 3), or unknowingly keeping expired medicines or empty medicine containers, or taking medicines prescribed for others

- on admission to hospital, lack of a full list of medicines the patient is taking, which may result in an adverse event

- at discharge from hospital, inadequate procedures and insufficient information given to patients and their carers, GPs, nurses and pharmacists to allow adequate follow-up treatment in the community

- risk of duplication of medicines when provided by more than one source

- poor communication between specialists and GPs and inadequate models of shared care.

According to the National Chronic Disease Strategy, medicine use should be reviewed regularly, and effective communication and sharing of information between specialist, acute and primary health care providers, including pharmacists, is essential. Health professionals also need to be skilled in behavioural interventions, support for self-management and other evidence-based approaches to encourage people to use medicines optimally (National Health Priority Council 2006).

A recent international study examined issues of safety, health care coordination, chronic disease care and access to care and found areas of concern (Schoen et al. 2005). Adults who had recently been hospitalised, had surgery or had health problems were interviewed in 2005. In Australia, 19% of participants believed they had experienced a medical mistake in care or were given the wrong medicine or dose, with 63% saying this had happened outside hospital. Although 92% of Australians surveyed had a regular doctor, a significant proportion of people with chronic disease reported problems with their doctor:

- clear instructions not given or treatment goals unclear (19%)

- no discussion of treatment choices (45%)

- no review of all medicines taken by patients including those prescribed by other doctors (46%)

- no explanation of medicine side effects (36%)

- patients not given a plan to self-manage their condition (50%).

One in four Australians participating in the survey reported using four or more prescription medicines regularly and one in five skipped doses or did not fill prescriptions owing to cost. Among Australians surveyed who had been hospitalised in the previous two years, at discharge 23% were prescribed new medicines without having their other medicines reviewed, 18% did not get instructions about symptoms to watch out for, 9% did not know who to contact with questions about their treatment, and 23% were left without follow-up care arrangements.

The study's findings highlight deficiencies in communication between patients and health professionals, poor care coordination, safety risks and inadequate care of patients with chronic disease.

2.3 Medicines and cardiovascular disease

Cardiovascular disease affects nearly one in five Australians—about 3.5 million people (Table 1). Based on self-reports, the most common conditions are hypertension, tachycardia, coronary heart disease and heart failure. The prevalence of cardiovascular disease increases with age to 54% in those aged 65 years and over. About 65% of those with cardiovascular disease report using medicines for their cardiovascular condition(s), amounting to 2.3 million people (ABS 2006). For further details of these medicines, see Chapter 4.

About 20% of people with diabetes also have a long-term cardiovascular condition. Among those aged 65 years and over, 27% had one or more cardiovascular conditions (ABS 2006). Diabetes is an important risk factor for cardiovascular disease and cardiovascular conditions, such as coronary heart disease, stroke and peripheral vascular disease, are important long-term complications of diabetes.

Table 1: Prevalence of selected conditions among Australians, 2004–05

Condition	People with condition All ages		People with condition Age 65 years and over	
	Number ('000)	Per cent	Number ('000)	Per cent
Hypertension	2,100.7	10.5	962.6	37.0
Tachycardia	417.4	2.1	212.0	8.1
Coronary heart disease	366.6	1.8	242.5	9.3
Heart failure and oedema	263.0	1.3	141.0	5.4
Diseases of arteries, arterioles and capillaries	203.6	1.0	120.0	4.6
Cerebrovascular diseases	90.8	0.5	59.6	2.3
All cardiovascular disease	**3,536.6**	**17.6**	**1,400.2**	**53.8**
High blood cholesterol	1,339.7	6.8	563.4	21.6
Diabetes	699.6	3.5	333.2	12.8

Note: These conditions are explained in the Glossary.

Source: ABS 2006.

Effective medicines to prevent and treat cardiovascular disease are available in Australia. The recommended indications for medicines used in cardiovascular disease are shown in Table 2. Note that some of the medicines listed also have other important uses outside the cardiovascular system, which have been excluded from the table. In this report we use the

Anatomical Therapeutic Chemical (ATC) classification of medicines, developed by the World Health Organisation, because this is the classification adopted by the main data sources analysed here. The ATC classification is the Australian standard for classifying medicines, but it does not align well with clinical practice or pharmacology and has confusing terminology (see also Note on page 9).

Areas needing improvements in clinical practice regarding the use of medicines to prevent and treat cardiovascular conditions have been identified (National Institute of Clinical Studies 2003, 2005; Australian Council for Safety and Quality in Health Care and National Institute of Clinical Studies 2004). Examples include:

- under-use of antithrombotic (clot-preventing) agents, such as warfarin, to prevent stroke in patients with atrial fibrillation
- under-use of Angiotensin-converting-enzyme (ACE) inhibitors and beta-blocking agents in patients with heart failure
- under-use of ACE inhibitors and beta-blocking agents in patients with, and following, acute coronary syndromes
- under-use of medicines to lower blood pressure in people with hypertension, including people at high risk of cardiovascular disease
- under-use of clot-busting medicines (thrombolysis) in eligible patients with stroke.

Table 2: Indications for medicines used in cardiovascular disease

Medicine type (example)	Indications	Comments
Antithrombotic agents		
Vitamin K antagonists (warfarin)	• Prevent and treat venous thromboembolism • Prevent stroke in patients with atrial fibrillation • Prevent thromboembolism in patients with prosthetic heart valves	These medicines have a narrow window between therapeutic use and toxicity, as well as many interactions with other medicines. They require careful monitoring for safe use.
Heparin group (enoxaparin)	• Prevent and treat venous thromboembolism in patients undergoing surgery and high-risk patients • Treat arterial thromboembolism in acute myocardial infarction, unstable angina • Prevent thrombosis during coronary angioplasty, cardiopulmonary bypass and dialysis	
Platelet aggregation inhibitors (aspirin)	• Prevent myocardial infarction and stroke in patients with cardiovascular risk factors • Prevent myocardial infarction and stroke in patients with previous myocardial infarction, stroke, transient ischaemic attack, angina, peripheral arterial disease or atrial fibrillation • Treat acute myocardial infarction and acute ischaemic stroke • Prevent thrombosis during and after percutaneous coronary interventions	
Thrombolytic enzymes (alteplase)	• Treat acute myocardial infarction and acute ischaemic stroke • Treat peripheral arterial thromboembolism	

(continued)

Table 2 (continued): Indications for medicines used in cardiovascular disease

Medicine type (example)	Indications	Comments
Cardiac therapy		
Cardiac glycosides (digoxin)	• Treat arrhythmias (atrial fibrillation or flutter) • Prevent worsening of heart failure	
Antiarrhythmics (amiodarone)	• Prevent life threatening arrhythmias that could lead to sudden cardiac death • Treat arrhythmias and relieve symptoms	
Cardiac-stimulants (adrenaline)	• Treat heart arrest • Treat heart failure • Treat low blood pressure • Treat cardiogenic shock due to myocardial infarction	
Vasodilators (isosorbide mononitrate)	• Prevent and treat angina	
Antihypertensives	• Treat hypertension to prevent disease and deaths from stroke, coronary heart disease, heart failure and aortic aneurysm • Treat hypertension to reduce microvascular disease affecting kidney, brain and retina	• Agents acting on arteriolar smooth muscle, such as hydralazine, are potent blood-pressure-lowering medicines reserved for refractory hypertension or for hypertensive emergencies. • Centrally acting antiadrenergic agents, such as methyldopa, are not recommended as first line treatment as they are less well tolerated than other blood-pressure-lowering medicines.
Diuretics (frusemide)	• Treat hypertension to prevent disease and deaths from stroke, coronary heart disease, heart failure and aortic aneurysm • Treat hypertension to reduce microvascular disease affecting kidney, brain and retina	Low-dose thiazide diuretics recommended as first line treatment for hypertension as they are at least as effective as all other medicine classes in lowering blood pressure and are the least expensive.
Peripheral vasodilators (oxpentifylline)	• Treat hypertension to prevent disease and deaths from stroke, coronary heart disease, heart failure and aortic aneurysm • Treat hypertension to reduce microvascular disease affecting kidney, brain and retina • Treat peripheral vascular disease	
Calcium-channel blockers (amlodipine)	• Treat hypertension to prevent disease and deaths from stroke, coronary heart disease, heart failure and aortic aneurysm • Treat hypertension to reduce microvascular disease affecting kidney, brain and retina • Prevent angina	

(continued)

Table 2 (continued): Indications for medicines used in cardiovascular disease

Medicine type (example)	Indications	Comments
Beta-blocking agents (atenolol)	• Treat hypertension to prevent disease and deaths from stroke, coronary heart disease, heart failure and aortic aneurysm • Treat hypertension to reduce microvascular disease affecting kidney, brain and retina • Treat angina • Treat arrhythmias • Prevent further cardiovascular events and death following myocardial infarction • Treat heart failure	• Atenolol, metoprolol and propanolol reduce risk of further cardiovascular events and death in patients after myocardial infarction and are recommended in these patients. • Used with an ACE inhibitor and a diuretic, several beta-blockers reduce risk of death and hospitalisation in patients with heart failure.
Agents acting on renin–angiotensin system	• Treat hypertension to prevent disease and deaths from stroke, coronary heart disease, heart failure and aortic aneurysm • Treat hypertension to reduce microvascular disease affecting kidney, brain and retina	
Angiotensin-converting-enzyme (ACE) inhibitors (ramipril)	• Treat heart failure and delay disease progression • Prevent development of heart failure following myocardial infarction • Reduce risk of myocardial infarction, stroke and cardiovascular death in selected patients with coronary heart disease, stroke, peripheral vascular disease or diabetes • Diabetic nephropathy • Prevent worsening of kidney failure	Recommended first line treatment in patients with heart failure, or with left ventricular dysfunction following myocardial infarction, or with diabetes and microalbuminuria.
Angiotensin II antagonists (irbesartan)	• Treat heart failure and delay disease progression in patient unable to tolerate ACE inhibitors • Reduce progression of kidney disease in selected patients	
Serum-lipid-reducing agents (atorvastatin)	• Treat lipid disorders to reduce progression of atherosclerosis and reduce risk of myocardial infarction and stroke in people with established cardiovascular disease • Treat lipid disorders to prevent cardiovascular disease and deaths in people at high risk of myocardial infarction and stroke due to the presence of multiple risk factors	• HMG CoA reductase inhibitors (statins) are the most effective medicines to reduce LDL cholesterol and are well tolerated. • For raised triglyceride, fibrates are first choice, but statins may be used instead if the patient has cardiovascular disease. • Nicotinic acid lowers cholesterol and triglyceride levels, but is often poorly tolerated.

Notes

1. Only those indications relevant to cardiovascular disease are listed here. However, some of the medicines in this table have other indications as well.
2. Medicines shown in this table are classified according to the Anatomical Therapeutic Chemical (ATC) system. For more information, see the Appendix.

Source: Australian Medicines Handbook 2006.