9 Cardiovascular problems

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9.1 Background

Cardiovascular problems contribute to significant patient morbidity and loss of quality of life, and to financial burden for both patients and the health system. In Australia, 18% of the total burden of disease and injury in 2003 resulted from cardiovascular diseases, with coronary heart disease and stroke accounting for more than four-fifths of this burden.[1]

The 2007–08 National Health Survey reported that 16% of the population had one or more long-term conditions of the cardiovascular system.[2] In 2007–08, cardiovascular problems were managed at a rate of 17.6 per 100 encounters with GPs, which equates to 19.3 million Medicare encounters across Australia where a cardiovascular problem was managed in that year.[3]

Barraclough & Gardner (2007) commented that '*…the biggest challenge for Australian policy makers is to address the consequences of major success: that Australians are living a lot longer today and are not dying as rapidly as they used to after being diagnosed with, for example, heart disease or cancer*'.[4] This statement is true, in that the incidence of acute ischaemic heart disease events has decreased over time—between 1994 and 2005, the incidence among males decreased by 32% and among females, by 34%.[5]

But despite the decline of such events in recent decades, cardiovascular disease is still the major cause of premature death in Australia, and its health and economic burden continues to exceed that of any other disease.[1]

Biological and physiological factors such as age, gender and family history contribute to the development of cardiovascular disease, as do psychosocial factors such as depression, social isolation and lack of social support.[6] Many of the risk factors contributing to this disease are behavioural, and modifiable. These include smoking, excessive alcohol consumption, overweight or obesity, and poor dietary habits and sedentary lifestyles that contribute to excess weight, and increased blood pressure, glucose levels and abnormal cholesterol levels.[7] A major focus of preventive care has been the modification of risk factors for those at increased risk of cardiovascular disease to prevent or postpone its onset or progression.

The major interventions are lifestyle and pharmacological. Pharmacological interventions have improved, and new medications have become available over the decade to 2007–08 that can reduce the risk of heart attack and stroke in people with established symptomatic vascular disease, and others at increased risk of developing cardiovascular disease, including those with clinical evidence of target organ damage and those with multiple risk factors. The benefits of medications vary with the individual and their level of baseline risk, and depending on their level of morbidity (and comorbidity), targets for risk factors such as lipid levels and blood pressure may vary.[8] As new evidence emerges, Therapeutic Guidelines, and recommendations are updated.[8,9]

Generally people with established cardiovascular impairment require a combination of pharmacological and lifestyle modification therapy. In instances where patients may currently be asymptomatic but are at high absolute risk, in addition to lifestyle advice, pharmacological interventions are often recommended as a preventive measure. This is also

an important consideration for those with a family history of premature cardiovascular disease. Asymptomatic patients with one or more risk factors are counselled to modify any risk behaviours such as smoking, excessive alcohol consumption, or poor diet contributing to excess weight or abnormal cholesterol.[8] The risk behaviours engaged in by patients contribute substantially to the sizeable proportion of preventable cardiovascular disease.[10]

Guidelines and recommendations have been developed:

- to determine those in healthy weight ranges and those at risk because of excess weight
- for dietary advice for adults, children and the elderly
- for determining safe and hazardous levels of alcohol consumption.[11]

The National Health and Medical Research Council guidelines for alcohol consumption have been the recommended guidelines for clinicians since 2001.[12] Work began to update them in 2008[11], and the revised guidelines were published in March 2009.[13] These, and the non-smoking policies and legislation introduced over the past 15 years, may have contributed to the decrease in cardiovascular events experienced over that time.[5]

However, there have been varying degrees of success in each of these areas. For example, among general practice patients sampled during the decade, there was a steady decrease in the proportion of patients who smoked daily or occasionally, no change in the proportion who reported drinking at responsible or at-risk levels, a steady increase in the proportion of adults considered overweight or obese, and no change in the proportion of children in these categories.[14]

Policies and initiatives

Over the decade to 2007–08, national policy and primary care health service models for provision of care have undergone many changes. Preventive and ongoing care is promoted in place of the historical model of reactive, acute care provided episodically. A brief description of policy changes that may have affected the management of cardiovascular disease is provided below.

- In 1996, cardiovascular disease was established as one of the original National Health Priority Areas due its widespread nature and the potential for prevention in this area.[15]
- In 1999, health assessment items were introduced for GPs undertaking annual check-ups of people aged 75 years and older, and Aboriginal and Torres Strait Islander peoples aged 55 years and older.[16]
- In 1999, multidisciplinary care plans and case conference items were introduced.[17]
- In 2004, a specific item number was introduced to reimburse GPs for comprehensive medical assessment of patients in residential aged care facilities.[18]
- In 2004, a specific item number was introduced for patient care provided by a practice nurse under the supervision of a GP.[17]
- In 2005, the multidisciplinary care plan items introduced in 1999 were replaced with GP management plans, which included 'Chronic disease management' items (MBS item numbers 721, 723, 725, 727, 729, 731).[19] While many of these items are non-specific and can be applied to any chronic health problem, they can be used for chronic cardiovascular problems once these have been diagnosed.
- In 2006, a one-off health check item was introduced for people aged 45–49 years.[20]

- In 2006, PBS criteria for lipid-modifying medications were revised to facilitate treatment according to risk of future cardiovascular events, rather than cholesterol concentration alone.[21]
- In 2008, in recognition of the increasing risk of obesity to cardiovascular and other diseases, the Australian health ministers announced the inclusion of obesity as a National Health Priority Area.[22]

Method

In this chapter, the most common cardiovascular problems managed by GP BEACH participants in the first year of data collection (1998–99) and the most recent year (2007–08) are compared and reported. For a full description of the BEACH methods see Chapter 2. Problems have been selected according to body system, and cardiac, vascular and cerebrovascular problems are reported separately. For this purpose, the problems listed in the 'K' Chapter of the International Classification of Primary Care—Version 2 (ICPC-2) at rubric level have each been assigned to either:

- a cardiac group (defined as problems associated specifically with the heart muscle and chambers)
- a vascular group (defined as problems associated with the blood vessels)
- a cerebrovascular group (defined as problems associated with the brain or blood vessels that supply it) (see Appendix 3).

Because of the impact of lipid problems on the vascular function, lipid problems identified from the 'T' Chapter of ICPC-2 have been included in the vascular group for this analysis (also specified in Appendix 3).

Data for about 40,000 patients in the BEACH study are collected each year on patient height, body weight, smoking status and alcohol consumption. For patients aged 18 years or older, those who had any cardiovascular or lipid problem managed at the encounter were investigated for the presence of cardiovascular risk factors. This analysis looks at patients from the year 2001–02, as this was the first of the years where all three risk factors (body mass index, smoking and alcohol) were included on the BEACH encounter form for the same patients. Before that year, smoking status was collected separately. Data from 2001–03 are compared with data from 2006–08, and any changes over that time reported. All risk factor information was reported to the GPs by the patients. Overweight/obesity levels, and at-risk alcohol consumption were derived from patient self-reported height, weight and measures of alcohol consumption (see Chapter 2). To measure alcohol consumption, three items from the WHO Alcohol Use Disorders Identification Test (AUDIT)[23] were used, with scoring for an Australian setting.[24] Levels of at-risk drinking were assessed using the WHO AUDIT calculation. Lipid problems were reported by the GP as a problem managed at the encounter.

9.2 Cardiac problems

In 1998–99 there were 15,257 cardiovascular and/or lipid problems managed, of which 24.8% were cardiac problems. In 2007–08, 16,469 cardiovascular and/or lipid problems were managed, of which 22.2% were cardiac problems.

Most common cardiac problems managed

Table 9.1 shows the 10 most commonly managed cardiac problems in 1998–99 rank order, and their management rates in 1998–99 and in 2007–08.

There was no change in the overall management rate of cardiac problems over the decade. The management rate of ischaemic heart disease decreased significantly over the decade, from 1.5 problems per 100 encounters to 1.1 per 100; heart failure decreased from 0.9 to 0.6 per 100; and atrial fibrillation/flutter increased from 0.6 to 1.0 per 100 encounters. The management rates of all other cardiac problems remained unchanged over the period.

Table 9.1: Management rates of cardiac problems managed, 1998–99 and 2007–08

	Rate per 100 encounters (95% CI)		Percentage of all problems		Percentage of cardiac problems		
Morbidity managed	1998–99 (*n* = 96,901)	2007–08 (*n* = 95,898)	1998–99 (*n* = 140,824)	2007–08 (*n* = 145,078)	1998–99 (*n* =3,785)	2007–08 (*n* = 3,658)	Change[(a)]
Cardiac—all	4.1 (3.9–4.4)	4.0 (3.7–4.2)	2.8	2.6	100.0	100.0	—
Ischaemic heart disease	1.5 (1.4–1.7)	1.1 (1.0–1.2)	1.1	0.7	37.4	27.5	↓
Heart failure	0.9 (0.8–1.0)	0.6 (0.6–0.7)	0.6	0.4	21.3	16.0	↓
Atrial fibrillation/flutter	0.6 (0.5–0.6)	1.0 (0.9–1.1)	0.4	0.7	13.9	25.9	↑
Swollen ankles/ oedema	0.2 (0.1–0.2)	0.2 (0.2–0.3)	0.1	0.1	3.8	5.4	—
Palpitations/awareness of heart	0.1 (0.1–0.2)	0.2 (0.1–0.2)	0.1	0.1	3.5	3.7	—
Cardiac arrhythmia NOS	0.1 (0.1–0.2)	0.1 (0.1–0.2)	0.1	0.1	3.2	3.7	—
Heart disease, other	0.1 (0.1–0.1)	0.2 (0.1–0.2)	0.1	0.1	2.7	4.0	—
Heart valve disease NOS	0.1 (0.1–0.1)	0.1 (0.1–0.1)	0.1	0.1	2.6	1.9	—
Cardiac check-up	0.1 (0.1–0.1)	0.1 (0.0–0.1)	0.1	0.0	2.0	1.7	—
Acute myocardial infarction	0.1 (0.0–0.1)	0.1 (0.1–0.2)	0.1	0.0	1.9	1.3	—

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and — indicates there was no change.

Note: CI—confidence interval; NOS—not otherwise specified.

Management of cardiac problems

The patients

Table 9.2 summarises the management of cardiac problems in 1998–99 and 2007–08. There were no significant changes in age-specific management rates during the decade, but at both time points the sex-specific management rates for males were significantly higher than for females.

The age-specific rates did not change for patients in the younger age groups, but significantly decreased for patients aged 45–64 years, those aged 65–74 years and those aged 75 years and over.

The distribution of patients at cardiac encounters in 2007–08 did not differ from those of 1998–99 for:

- Commonwealth concession cardholder status
- Repatriation health cardholder status
- non-English-speaking background status
- Indigenous status
- new patient status
- state or territory of residence
- Rural, Remote and Metropolitan Area classification status.

Comorbidity managed

At encounters where a cardiac problem was managed, hypertension, diabetes and lipid disorders were the conditions most often managed with a cardiac problem, although the management rates of these conditions with a cardiac problem did not change. The management of oesophageal disease as a comorbidity significantly increased, from 2.4 per 100 cardiac encounters to 3.9 per 100, and the management of asthma significantly decreased (2.3 per 100 to 1.3 per 100 cardiac encounters) over the decade. Other commonly managed comorbidities were osteoarthritis, sleep disturbance, depression, chronic obstructive pulmonary disease and osteoporosis.

Medications

The proportion of cardiac problems with at least one medication being prescribed, supplied or advised for over-the-counter purchase decreased significantly. For prescribed medications, there were significant decreases in the prescribing rates of:

- organic nitrates
- plain sulfonamides
- digitalis glycosides
- plain angiotensin-converting enzymes (ACE) inhibitors
- benzothiazepine derivatives
- potassium
- dihydropyridine derivatives
- phenylalkylamine derivatives.

Significant increases were noted in the prescribing rate per 100 cardiac problems for:

- vitamin K antagonists
- platelet aggregation inhibitors excluding heparin
- HMG CoA reductase inhibitors
- Alpha- and beta-blocking agents.

Of medications most frequently prescribed, vitamin K antagonists moved from 5th position to 1st place, between 1998–99 and 2007–08. HMG CoA reductase inhibitors moved from 9th place up to 4th, and organic nitrates changed from 1st to 6th position. There were no significant changes in the prescribing rates of salicylic acid and derivatives, selective beta-blocking agents, low-ceiling diuretics and potassium-sparing agents, or plain angiotensin II antagonists. However, significant changes in the prescribing rates of other medications altered the ranking of these four medications—selective beta-blockers moved from 6th to 3rd most frequently prescribed medication for cardiac conditions, low-ceiling diuretics moved from 15th to 21st ranking, and plain angiotensin II antagonists from 18th position up to 13th (results not shown).

Table 9.2: Changes in management of cardiac problems, 1998–99 and 2007–08

	1998–99 (*n* = 3,785)		2007–08 (*n* = 3,658)		
Variable	**Sex-specific rate**	**95% CI**	**Sex-specific rate**	**95% CI**	**Change[(a)]**
Patients					
Males	5.0	(4.6–5.3)	4.9	(4.5–5.3)	—
Females	3.5	(3.2–3.7)	3.1	(3.0–3.5)	—
	Age-specific rate		**Age-specific rate**		
<1 year	0.6	(0.2–0.9)	0.7	(0.3–1.1)	—
1–4 years	0.3	(0.1–0.5)	0.3	(0.1–0.4)	—
5–14 years	0.3	(0.1–0.4)	0.2	(0.1–0.3)	—
15–24 years	0.4	(0.2–0.5)	0.5	(0.3–0.7)	—
25–44 years	0.7	(0.6–0.9)	0.7	(0.6–0.9)	—
45–64 years	3.8	(3.5–4.2)	3.1	(2.9–3.4)	↓
65–74 years	9.4	(8.7–10.1)	7.9	(7.2–8.6)	↓
75+ years	14.7	(13.8–15.7)	12.5	(11.6–13.3)	↓
Other problems managed	**Rate per 100 cardiac encs**		**Rate per 100 cardiac encs**		
Oesophageal disease	2.4	(1.9–3.0)	3.9	(3.1–4.6)	↑
Asthma	2.3	(1.8–2.9)	1.3	(0.9–1.6)	↓
Management	**Percentage of cardiac problems**		**Percentage of cardiac problems**		
At least one medication	64.4	(62.0–66.8)	54.0	(51.6–56.4)	↓
At least one other treatment	16.3	(14.7–17.9)	23.9	(21.6–26.2)	↑
At least one imaging order	3.3	(2.6–4.0)	4.9	(4.1–5.6)	↑
At least one pathology order	16.5	(15.0–18.1)	22.5	(20.5–24.4)	↑

(continued)

Table 9.2 (continued): Changes in management of cardiac problems, 1998–99 and 2007–08

Variable	1998–99 (*n* = 3,785) Rate per 100 cardiac problems	1998–99 (*n* = 3,785) 95% CI	2007–08 (*n* = 3,658) Rate per 100 cardiac problems	2007–08 (*n* = 3,658) 95% CI	Change[(a)]
Medications (total)	110.0	(104.0–116.0)	87.1	(81.8–92.3)	↓
Prescribed meds (ATC Level 4)	106.1	(99.9–112.3)	84.2	(79.0–89.4)	↓
Sulfonamides, plain	15.3	(13.7–16.8)	9.8	(8.5–11.1)	↓
Organic nitrates	18.3	(16.5–20.1)	6.3	(5.4–7.3)	↓
Digitalis glycosides	11.7	(10.4–13.0)	4.3	(3.4–5.2)	↓
ACE inhibitors, plain	10.7	(9.3–12.0)	6.3	(5.4.–7.3)	↓
Vitamin K antagonists	7.6	(6.6–8.6)	16.6	(14.1–19.1)	↑
Benzothiazepine derivatives	4.4	(3.6–5.3)	0.2	(0.0–0.3)	↓
Platelet aggregation inhibitors excluding heparin	(†)	(†)	4.7	(3.9–5.6)	↑
HMG CoA reductase inhibitors	3.4	(2.6–4.2)	6.5	(5.4–7.5)	↑
Potassium	3.4	(2.7–4.0)	1.0	(0.6–1.3)	↓
Beta blocking agents, non-selective	2.7	(2.0–3.3)	1.5	(1.0–2.0)	↓
Dihydropyridine derivatives	2.6	(2.0–3.1)	1.0	(0.4–1.5)	↓
Phenylalkylamine derivatives	1.7	(1.2–2.1)	0.7	(0.4–0.9)	↓
Aldosterone antagonists	0.4	(0.2–0.7)	1.2	(0.7–1.6)	↑
Alpha- & beta-blocking agents	0.4	(0.2–0.7)	2.1	(1.5–2.7)	↑
Other treatments	18.1	(16.3–19.9)	26.1	(23.5–28.7)	↑
Clinical	12.7	(11.2–14.3)	14.0	(12.4–15.6)	—
Advice/education—treatment	2.5	(1.6–3.3)	0.8	(0.4–1.1)	↓
Other admin/documentation	0.3	(0.1–0.4)	1.0	(0.6–1.3)	↑
Procedures	5.3	(4.4–6.3)	12.1	(10.0–14.2)	↑
INR test	(†)	(†)	5.5	(3.8–7.2)	↑
Referrals—2000–01*	10.5	(9.3–11.8)	11.6	(10.4–12.9)	—
Specialist—cardiologist	6.6	(5.6–7.6)	8.7	(7.6–9.8)	↑
Allied Health Services	1.0	(0.6–1.4)	0.3	(0.1–0.5)	↓

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—data were insufficient to calculate a meaningful estimate.

* Referrals, pathology and imaging were compared using data from 2000–01 because of a coding change which made data from 1998–00 incomparable.

Note: Probs—problems; encs—encounters; CI—confidence interval; ATC—Anatomical Therapeutic Chemical classification; meds—medications; INR—international normalised ratio.

Other treatments

There was also a significant increase in the rate of other treatments provided for cardiac problems, particularly procedural treatments, which increased from 5.3 per 100 cardiac problems in 1998–99 to 12.1 per 100 in 2007–08. The main catalyst for this change was the

availability of international normalised ratio (INR), a test of blood clotting for patients on warfarin) point-of-care testing, which was not available in 1998–99, but comprised 45.3% of total procedural treatments for all cardiac conditions in 2007–08, being performed at a rate of 5.5 per 100 cardiac problems. This coincided with the increase in the prescribing rate of warfarin sodium, from 7.6 per 100 cardiac problems in 1998–99, to 16.6 per 100 in 2007–08.

Referrals

The rate of referrals to specialists for cardiac problems did not change over the period, however there was a marginal increase in the rate of referrals to cardiologists. The referral rate to allied health services significantly decreased between 2000–01 and 2007–08.

9.3 Vascular and lipid problems

In 1998–99, 72.2% of the 15,257 cardiovascular and/or lipid problems managed were vascular/lipid problems. In 2007–08, 16,469 cardiovascular and/or lipid problems were managed, of which 75.1% were vascular/lipid problems.

Most common vascular/lipid problems managed

The management rate for vascular/lipid problems increased significantly, from 13.8 per 100 encounters in 1998–99 to 16.6 per 100 in 2007–08. Table 9.3 shows the only problems to have undergone change from the 10 most commonly managed vascular/lipid problems, and the management rates of these problems in 1998–99 and 2007–08.

Table 9.3: Changes in management rates of vascular/lipid problems managed, 1998–99 and 2007–08

	Rate per 100 encounters (95% CI)		Percentage of all problems		Percentage of vascular/lipid problems		
	1998–99 (*n* = 96,901)	2007–08 (*n* = 95,898)	1998–99 (*n* = 140,824)	2007–08 (*n* = 145,078)	1998–99 (*n* =11,019)	2007–08 (*n* = 12,362)	Change[(a)]
Vascular—all, including lipid disorders	13.8 (13.2–14.5)	16.6 (15.8–17.3)	9.5	11.0	100.0	100.0	↑
Hypertension	8.3 (7.8–8.7)	9.9 (9.3–10.4)	5.7	6.5	59.6	59.7	↑
Lipid disorders	2.5 (2.3–2.6)	3.7 (3.4–4.0)	1.7	2.4	17.8	22.3	↑
Elevated blood pressure	0.3 (0.3–0.4)	0.3 (0.2–0.3)	0.2	0.2	2.5	1.5	↓
Pulmonary embolism	0.1 (0.0–0.1)	0.1 (0.1–0.1)	0.0	0.1	0.3	0.6	↑

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, and ↑/↓ indicates a marginal change.

Note: CI—confidence interval.

The management rate of hypertension increased significantly, from 8.3 to 9.9 problems per 100 encounters, and of lipid disorders from 2.5 to 3.7 per 100. There was also a marginal increase in the management rate of pulmonary embolism, and a marginal decrease in that of elevated blood pressure.

Management rates for other commonly managed vascular/lipid problems remained unchanged over the period 1998–99 to 2007–08. These included cardiac check-ups, phlebitis/thrombophlebitis, haemorrhoids, postural hypertension, and atherosclerosis/peripheral arterial (vascular) disease.

Management of vascular/lipid problems

The patients

Table 9.4 summarises the management of vascular/lipid problems over the decade. At encounters where a vascular/lipid problem was managed, the sex-specific management rate increased for both males and females. While there was no difference between the sexes in 1998–99, by 2007–08 the management rate for males was significantly higher than for females.

There was a significant decrease in the age-specific management rate in the youngest age group, a marginal decrease in the 5–14 year age group, and a significant increase for patients aged 75 years or older. Significant decreases were also observed in the proportion of encounters with patients who:

- were Repatriation health cardholders
- were from a non–English speaking background, and
- were considered new to the practice.

The distribution of patients at encounters where a vascular/lipid problem was managed did not differ over the decade in terms of:

- Commonwealth concession cardholder status
- Indigenous status
- state or territory of residence
- Rural, Remote and Metropolitan Area classification status.

Comorbidity managed

Diabetes remained the comorbidity most frequently managed at vascular/lipid encounters, and significantly increased from 6.7 to 8.7 per 100 vascular/lipid encounters. The management of oesophageal disease increased from 2.2 to 4.5 per 100 vascular/lipid encounters, which moved this condition from the 9th to the 3rd most commonly managed comorbidity with a vascular/lipid problem. A significant increase was noted in the management rate of osteoporosis with a vascular/lipid problem, which had ranked 27th in 1998–99 but was the 8th most frequently managed comorbidity in 2007–08. There was a marginal increase in the management rate of depression, and a significant decrease in the management rate of ischaemic heart disease.

Management

At least one pathology test was ordered for 11.4 per 100 vascular/lipid problems in 1998–99, and this rate increased to 15.3 per 100 by 2007–08. While there was no change in the overall medication rate for vascular/lipid problems, or in the rate at which medications were prescribed or advised for over-the-counter purchase, there was a significant decrease in rate of GP-supplied medication for these problems.

Medications

There were many significant changes in the rates of medications most frequently prescribed for vascular/lipid problems.

- There were significant decreases in the prescribing rates of plain ACE inhibitors, dihydropyridine derivatives, selective beta-blocking agents, phenylalkylamine derivatives, alpha-adrenoreceptor antagonists, low-ceiling diuretics and potassium-sparing agents, and non-selective beta-blocking agents.
- The most notable changes were the adoption of combination products or other products not available in 1998–99—angiotensin II antagonists with diuretic, ACE inhibitors with diuretic, combinations of HMG CoA reductase inhibitors and other lipid modifying agents.
- There was also a significant increase in the rate of HMG CoA reductase inhibitors as a single product, and plain angiotensin II antagonists prescribed per 100 vascular/lipid problems. These products, with plain ACE inhibitors, were the three most frequently prescribed for the management of vascular/lipid problems by 2007–08.

Table 9.4: Vascular and lipid problems—summary of management changes, 1998–99 and 2007–08

	1998–99 (*n* = 12,470)		2007–08 (*n* = 14,365)		
Patient variables	**Sex-specific rate**	**95% CI**	**Sex-specific rate**	**95% CI**	**Change[(a)]**
Males	13.9	(13.2–14.6)	17.9	(17.0–18.8)	↑
Females	13.8	(13.1–14.5)	15.6	(14.8–16.4)	↑
	Age-specific rate		**Age-specific rate**		
<1 year	0.4	(0.1–0.6)	0.0	(0.0–0.0)	↓
1–4 years	0.1	(0.0–0.3)	0.1	(0.0–0.2)	—
5–14 years	0.2	(0.1–0.3)	0.1	(0.0–0.1)	↓
15–24 years	1.3	(1.0–1.6)	1.1	(0.8–1.3)	—
25–44 years	5.6	(5.2–6.0)	5.7	(5.2–6.1)	—
45–64 years	22.2	(21.3–23.2)	22.9	(21.9–24.0)	—
65–74 years	31.7	(30.2–33.2)	33.8	(32.1–35.5)	—
75+ years	25.3	(24.1–26.5)	30.5	(28.9–32.1)	↑
	Percentage of vascular/lipid encs		**Percentage of vascular/lipid encs**		
Repatriation health cardholder	5.9	(5.4–6.4)	4.6	(4.1–5.1)	↓
Non–English speaking background	18.0	(15.7–20.2)	13.2	(10.7–15.6)	↓
New patient to the practice	4.0	(3.5–4.5)	2.9	(2.4–3.3)	↓
Other problems managed	**Rate per 100 vascular/lipid encs**		**Rate per 100 vascular/lipid encs**		
Diabetes	6.7	(6.1–7.3)	8.7	(8.0–9.3)	↑
Oesophageal disease	2.2	(1.9–2.5)	4.5	(4.0–5.0)	↑
Depression	2.7	(2.3–3.0)	3.3	(3.0–3.7)	↑
Osteoporosis	0.9	(0.7–1.1)	2.0	(1.7–2.4)	↑
Ischaemic heart disease	3.0	(2.6–3.4)	2.0	(1.6–2.3)	↓

(continued)

Table 9.4 (continued): Vascular and lipid problems—summary of management changes, 1998–99 and 2007–08

Management actions	1998–99 (*n* = 12,470) Percentage of vascular/lipid problems	95% CI	2007–08 (*n* = 14,365) Percentage of vascular/lipid problems	95% CI	Change[(a)]
At least one pathology order	11.4	(10.7–12.1)	15.3	(14.3–16.2)	↑
	Rate per 100 vascular/lipid problems		**Rate per 100 vascular/lipid problems**		
Medications (total)	85.6	(82.7–88.6)	80.9	(77.8–84.0)	—
GP-supplied	3.0	(2.2–3.9)	1.7	(1.3–2.0)	↓
Prescribed meds (by ATC Level 4)	81.5	(78.5–84.6)	78.3	(75.1–81.4)	—
HMG CoA reductase inhibitors	10.8	(10.0–11.6)	14.4	(13.4–15.4)	↑
ACE inhibitors, plain	20.4	(19.3–21.5)	12.5	(11.7–13.3)	↓
Angiotensin II antagonists, plain	4.1	(3.6–4.6)	11.9	(11.0–12.8)	↑
Dihydropyridine derivatives	11.3	(10.3–11.9)	8.5	(7.8–9.1)	↓
Angiotensin II antagonists and diuretics	N/A	N/A	7.0	(6.4–7.7)	↑
Beta-blocking agents, selective	8.0	(7.3–8.6)	5.8	(5.3–6.3)	↓
ACE inhibitors and diuretics	N/A	N/A	3.1	(2.7–3.4)	↑
Phenylalkylamine derivatives	3.1	(2.7–3.5)	1.1	(0.9–1.3)	↓
Sulfonamides, plain	1.7	(1.4–2.0)	2.0	(1.7–2.4)	—
Other lipid modifying agents	N/A	N/A	0.7	(0.5–0.8)	↑
Alpha-adrenoreceptor antagonists	1.6	(1.3–1.8)	0.6	(0.5–0.8)	↓
HMG CoA reductase inhibitors, other combinations	N/A	N/A	0.4	(0.3–0.6)	↑
Low-ceiling diuretics and potassium-sparing agents	1.6	(1.3–1.9)	0.4	(0.3–0.5)	↓
Beta blocking agents, non-selective	1.2	(0.9–1.4)	0.4	(0.2–0.5)	↓
HMG CoA reductase inhibitors in combination with other lipid-modifying agents	N/A	N/A	0.4	(0.2–0.5)	↑
Other treatments	20.9	(19.2–22.5)	22.7	(20.9–24.6)	—
Clinical	19.6	(18.0–21.2)	20.1	(18.3–21.9)	—
Advice/education—treatment	1.5	(1.2–1.8)	0.3	(0.2–0.4)	↓
Counselling—problem	1.5	(1.2–1.8)	2.4	(1.9–2.8)	↑
Procedures	1.3	(1.1–1.5)	2.6	(2.2–3.1)	↑
INR test	(†)	(†)	0.5	(0.3–0.7)	↑
Physical function test	(†)	(†)	0.5	(0.3–0.6)	↑
Check-up, practice nurse	N/A	N/A	0.4	(0.2–0.6)	↑

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—CI not provided as data were insufficient to calculate a meaningful estimate.

Note: CI—confidence interval; encs—encounters; ATC—Anatomical Therapeutic Chemical Classification; N/A— not applicable as combination product not available in 1998–99.

Other treatments

There was no significant change in the overall rate at which clinical treatments were provided for vascular/lipid problems. However, advice/education about treatment was given less often in 2007–08 (decreasing from 1.5 to 0.3 per 100 vascular/lipid problems), and the rate at which counselling was provided increased from 1.5 to 2.4 per 100 vascular/lipid problems.

Procedural treatments increased from 1.3 per 100 in 1998–99 to 2.6 per 100 in 2007–08, most likely due to the uptake of procedures not available in 1998–99, such as INR point-of-care testing, and check-ups performed by practice nurses, which comprised 19.0% and 16.6%, respectively, of total procedural treatments for all vascular/lipid conditions in 2007–08. A significant increase in the rate of physical function tests was also apparent, from fewer than 3 observations in 1998–99 to 0.6 per 100 vascular/lipid problems in 2007–08, which represented 17.0% of total procedural treatments for these problems in the latter year.

Referrals

There were no significant changes in the rates of referrals in total, or in referrals to specialists or to allied health professionals.

9.4 Cerebrovascular problems

In 1998–99 15,257 cardiovascular and/or lipid problems were managed, of which 3.0% were cerebrovascular problems. In 2007–08, 2.7% of the 16,469 total cardiovascular and/or lipid problems managed were cerebrovascular problems.

Most common cerebrovascular problems managed

The management rate of cerebrovascular problems remained unchanged over the decade, at 0.5 per 100 encounters in both 1998–99 and 2007–08. The management rate of stroke/cerebrovascular accident, transient cerebral ischaemia and other cerebrovascular disease also remained unchanged (Table 9.5).

Table 9.5: Summary of cerebrovascular problems managed, 1998–99 and 2007–08

	Rate per 100 encounters (95% CI)		Percentage of all problems (95% CI)		Percentage of cerebrovascular problems		
Problem managed	1998–99 (*n* = 96,901)	2007–08 (*n* = 95,898)	1998–99 (*n* = 140,824)	2007–08 (*n* = 145,078)	1998–99 (*n* =453)	2007–08 (*n* = 449)	Change[(a)]
Cerebrovascular—all	0.47 (0.41–0.53)	0.47 (0.41–0.53)	0.3	0.3	100.0	100.0	—
Stroke/Cerebrovascular accident	0.17 (0.13–0.22)	0.22 (0.18–0.26)	0.1	0.2	36.5	47.7	—
Transient cerebral ischaemia	0.2 (0.1–0.2)	0.15 (0.12–0.18)	0.1	0.1	34.3	32.6	—
Other cerebrovascular disease	0.1 (0.1–0.2)	0.09 (0.07–0.12)	0.1	0.1	29.3	19.7	—

(a) The change is indicated for each variable:— indicates there was no change.

Note: CI—confidence interval.

Management of cerebrovascular disease

The patients

Table 9.6 summarises the management of cerebrovascular problems over the decade. There was no change in the sex-specific management rate over time for males, but there was a marginal increase for females. Males were significantly more likely to have cerebrovascular disease managed in 1998–99, but this difference was no longer apparent in 2007–08.

There were no significant changes over time in age-specific rates. The distribution of patients at cerebrovascular encounters in 2007–08 did not differ from those of 1998–99 for:

- Commonwealth concession cardholder status
- Repatriation health cardholder status
- non-English-speaking background status
- Indigenous status
- new patient status
- state or territory of residence
- Rural, Remote and Metropolitan Area classification status.

Comorbidity managed

In both 1998–99 and 2007–08, hypertension and diabetes were the two other problems most frequently managed with a cerebrovascular problem. Lipid disorders moved to 3rd position in 2007–08 (from 7th in 1998–99), although no changes were noted in the management rate of these conditions with a cerebrovascular problem over time. Other commonly managed comorbidities in 2007–08 were osteoarthritis, oesophageal disease, urinary tract infections, dementia, ischaemic heart disease, osteoporosis and depression.

Medications

The overall medication rate for cerebrovascular problems increased significantly over the decade, from 49.7 to 67.1 per 100 cerebrovascular problems. Most of this increase was in prescribed medications, which increased from 46.6 per 100 to 63.3 per 100 cerebrovascular problems. The most obvious changes were the 22-fold increase in the prescribing rate of platelet aggregation inhibitors (other than heparin), the five-fold increase in HMG CoA reductase inhibitors, and the increase for phenothiazines with piperazine structure.

Other treatments

There was no significant change in the overall rate of other treatments provided for cerebrovascular problems, or in the rate of clinical treatments or procedures generally. There was an increase in international normalised ratio point-of-care testing, which comprised 34.4% of total procedural treatments for all cerebrovascular conditions in 2007–08.

Referrals

There were no changes in the rates of referrals to specialists or allied health services, or in ordering rates of pathology or imaging from 2000–01 to 2007–08.

Table 9.6: Cerebrovascular problems—summary of management changes, 1998–99 and 2007–08

	1998–99 (*n* = 12,470)		2007–08 (*n* = 14,365)		
Patients	**Sex-specific rate**	**95% CI**	**Sex-specific rate**	**95% CI**	**Change[(a)]**
Males	0.6	(0.5–0.7)	0.5	(0.4–0.6)	—
Females	0.3	(0.3–0.4)	0.5	(0.4–0.6)	↑
	Age-specific rate		**Age-specific rate**		
<1 year	0.0	(0.0–0.1)	0.0	(0.0–0.0)	—
1–4 years	0.0	(0.0–0.0)	0.0	(0.0–0.1)	—
5–14 years	0.0	(0.0–0.0)	0.0	(0.0–0.0)	—
15–24 years	0.0	(0.0–0.0)	0.0	(0.0–0.0)	—
25–44 years	0.1	(0.0–0.1)	0.1	(0.0–0.1)	—
45–64 years	0.4	(0.3–0.5)	0.3	(0.2–0.4)	—
65–74 years	1.0	(0.8–1.2)	1.0	(0.7–1.2)	—
75+ years	1.9	(1.5–2.3)	1.7	(1.4–1.9)	—
Other problems managed	**Rate per 100 cerebrovascular encounters**		**Rate per 100 cerebrovascular encounters**		
Hypertension	17.0	(13.0–21.0)	18.8	(14.5–23.1)	—
Diabetes	4.4	(2.8–7.0)	6.7	(3.8–9.3)	—
Lipid disorders	2.8	(1.1–4.4)	5.2	(3.0–7.5)	—
Management actions	**Rate per 100 cerebrovascular problems**		**Rate per 100 cerebrovascular problems**		
Medications (total)	49.7	(42.7–56.7)	67.1	(58.5–75.8)	↑
Prescribed medications (by ATC Level 4)	46.6	(39.6–53.6)	63.3	(54.5–72.0)	↑
Platelet aggregation inhibitors excluding heparin	0.9	(0.0–1.9)	22.7	(18.2–27.3)	↑
HMG CoA reductase inhibitors	1.1	(0.1–2.1)	5.1	(2.7–7.5)	↑
Phenothiazines with piperazine structure	0.3	(†)	1.3	(0.3–2.4)	↑
Other treatments	20.3	(15.7–24.8)	20.4	(16.3–24.5)	—
Clinical treatments	17.5	(13.3–21.7)	16.4	(12.6–20.1)	—
Procedures	2.7	(0.7–4.8)	4.0	(2.1–6.0)	—
INR test	(†)	(†)	1.4	(0.1–2.6)	↑

(a) The direction and type of change is indicated for each variable: ↑/↓ indicates a statistically significant change, ↑/↓ indicates a marginal change, and — indicates there was no change.

† Fewer than three observations—95% confidence interval not provided as data were insufficient to calculate a meaningful estimate.

Note: CI—confidence interval; ATC—Anatomical Therapeutic Chemical classification; INR—international normalised ratio.

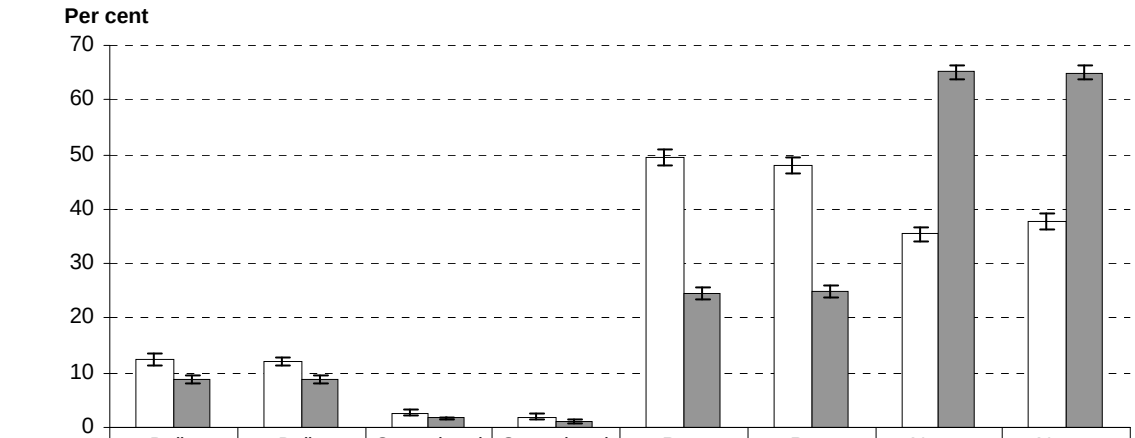
9.5 Health risk behaviours among patients with cardiovascular and/or lipid problems managed

In the 7-years from 2001–02 to 2007–08, information about height, weight (for calculation of body mass index; BMI), alcohol consumption and smoking status were collected from the same patients in the SAND section of the BEACH encounter form (see Chapter 2). Since then details have been reported for 231,413 patients aged 18 years or older. Not all information was provided for all patients; consequently, the denominators vary slightly depending on the number of responses for each risk factor. Patient sex was not stated for some respondents, and these were removed from the analyses.

For sufficient sample sizes to investigate differences in risk behaviours over time for patients at cerebrovascular encounters, data from the first 2 years of collecting all three risk behaviours from the same patients (2001–03) were selected and compared with the most recent 2 years (2006–08).

Smoking prevalence

Patient age, sex and smoking status were specified for 12,767 (57.0% female and 43% male) adult respondents at cardiovascular/lipid encounters in 2001–03, and 13,041 patients (55.5% female and 44.5% male) in 2006–08. Almost two-thirds of females and more than one-third of males had never smoked. At both time points, smoking was significantly more prevalent among male patients than female patients with cardiovascular/lipid problems managed (Figure 9.1) The 2006–08 prevalence of daily smoking was significantly lower among these patients than among adult patients at all BEACH encounters in 2006–08, where 20% of males and 14% of females were daily smokers.[14]



	Daily 2001–03	Daily 2006–08	Occasional 2001–03	Occasional 2006–08	Past 2001–03	Past 2006–08	Never 2001–03	Never 2006–08
Male	12.5	12.1	2.7	2.0	49.5	48.1	35.4	37.8
Female	8.7	8.8	1.7	1.2	24.4	25.1	65.2	64.9

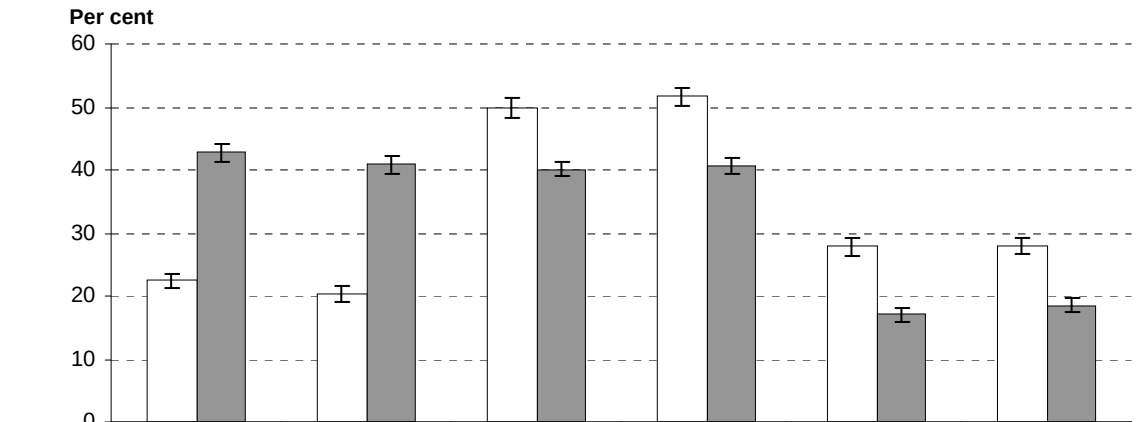
Figure 9.1: Smoking status of adult patients at cardiovascular/lipid encounters by patient sex, 2001–03 and 2006–08 (95% CI)

Alcohol consumption

Patient age, sex and alcohol consumption were provided for 12,677 (57.1% female and 42.9% male) adult respondents at cardiovascular/lipid encounters in 2001–03, and 12,776 patients (55.6% female and 44.4% male) in 2006–08. Measures of alcohol consumption used are reported in Chapter 2.

Overall, over one in four males, and almost one in five females reported drinking at-risk levels of alcohol. Significantly more male than female cardiovascular patients reported at-risk drinking levels at both time points (Figure 9.2). The 2006–08 prevalence of at-risk drinking was significantly lower in these patients than in adult patients at all BEACH encounters in 2006–08, where 32% of males and 23% of females reported at-risk drinking levels.[3]

In all categories, the difference between the sexes was significant, but no within-sex changes occurred over time in any category. Responsible drinkers accounted for half of the male respondents and two-fifths of the female respondents. In both periods, two-fifths of female patients reported that they did not drink at all, compared with one-fifth of male patients. The proportions of either sex who were non-drinkers did not differ for patients at encounters where a cardiovascular problem was managed. A significantly greater proportion of females with cardiovascular/lipid problems managed were non-drinkers compared with females at all BEACH encounters (2006–08), but there was no difference in the proportion of male non-drinkers.[14]



	Non-drinker 2001–03	Non-drinker 2006–08	Responsible drinker 2001–03	Responsible drinker 2006–08	At-risk drinker 2001–03	At-risk drinker 2006–08
Male	22.4	20.3	49.8	51.7	27.8	28.0
Female	42.8	40.8	40.1	40.7	17.0	18.5

Alcohol consumption by data period

Figure 9.2: Alcohol consumption in adult patients at cardiovascular/lipid encounter, by patient sex, 2001–03 and 2006–08 (95% CI)

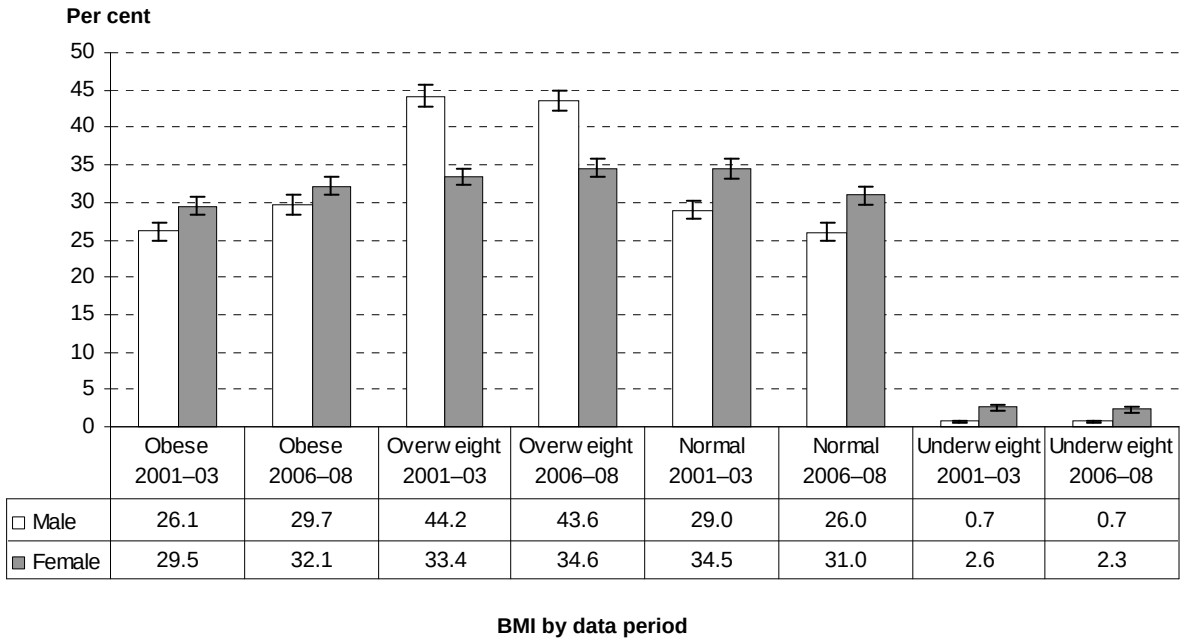
Body mass index

Patient age, sex, and self-reported height and weight were provided for 12,646 (56.8% female and 43.2% male) adult respondents at cardiovascular/lipid encounters in 2001–03, and 12,793 adult patients (55.4% female and 44.6% male) in 2006–08. Body mass index (BMI) calculations used are reported in Chapter 2.

- At both time points, significantly fewer males compared with females were in the normal weight range.
- One-third of males, and about one-third of females were in the normal weight range, although the proportions for each sex significantly decreased over time.
- In total, two-thirds or more of both males and females were classified as overweight or obese—70.3% of males in 2001–03, and 73.3% in 2006–08; 62.9% of females in 2001–03, and 66.7% in 2006–08.
- There was a significant increase for both sexes in the obese category.
- More than one-quarter of males and nearly one-third of females were classified as obese, although there were significantly more females than males in the obese category at both time points.
- Males were far more likely to be overweight than females, but when both categories were combined, males at cardiovascular/lipid encounters were considerably more likely to have the excess weight risk factor than their female counterparts (Figure 9.3).

When compared with adult patients at all BEACH encounters 2006–08, the patients at cardiovascular/lipid encounters were:

- less likely to be in the normal weight range
- more likely to be obese
- more likely to be overweight[14] (results not shown).



	Obese 2001–03	Obese 2006–08	Overw eight 2001–03	Overw eight 2006–08	Normal 2001–03	Normal 2006–08	Underw eight 2001–03	Underw eight 2006–08
Male	26.1	29.7	44.2	43.6	29.0	26.0	0.7	0.7
Female	29.5	32.1	33.4	34.6	34.5	31.0	2.6	2.3

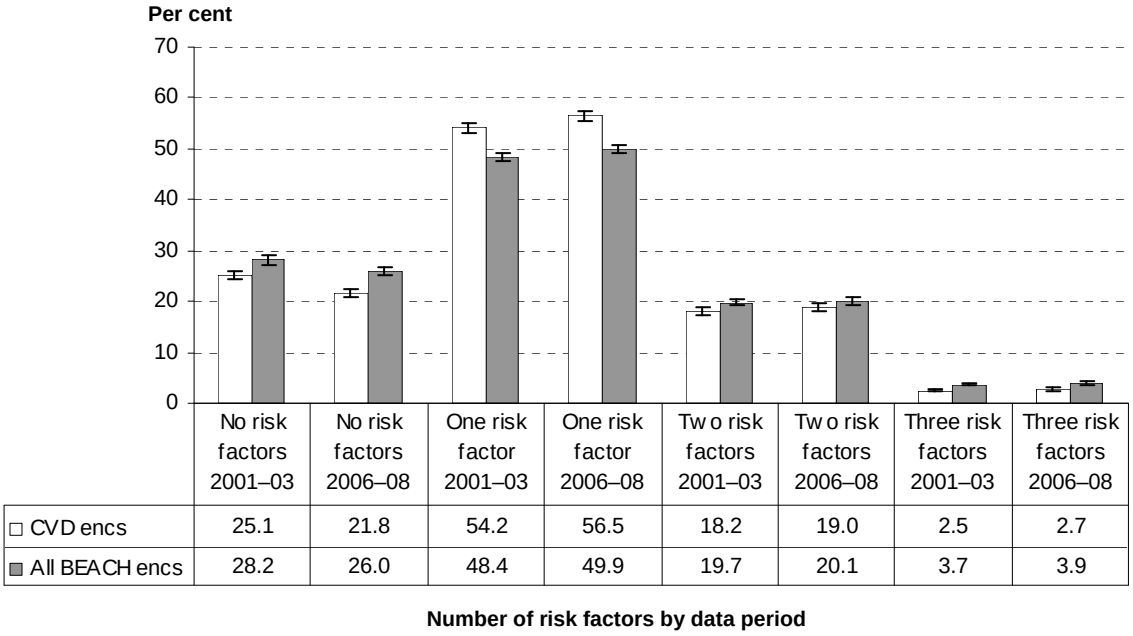
Figure 9.3: Body mass index of adult patients at cardiovascular/lipid encounters by patient sex, 2001–03 and 2006–08 (95% CI)

Multiple lifestyle risk factors

All data elements (height and weight, alcohol and smoking behaviour) were reported for 12,263 (56.8% female and 43.2% male) adult respondents at cardiovascular/lipid encounters in 2001–03 and 12,438 (55.4% female and 44.6% male) in 2006–08.

Figure 9.4 summarises the prevalence of risk factors for patients at cardiovascular/lipid encounters and at all BEACH encounters at both time points. Compared with patients at all BEACH encounters, a greater proportion of cardiovascular/lipid patients had at least one risk factor, although a significantly smaller proportion had three risk factors. Between 2001–03 and 2006–08, in both groups:

- the proportion of patients with no risk factors significantly decreased
- the proportion with one risk factor significantly increased
- there were no changes for the proportions of patients with two risk factors, or with three.



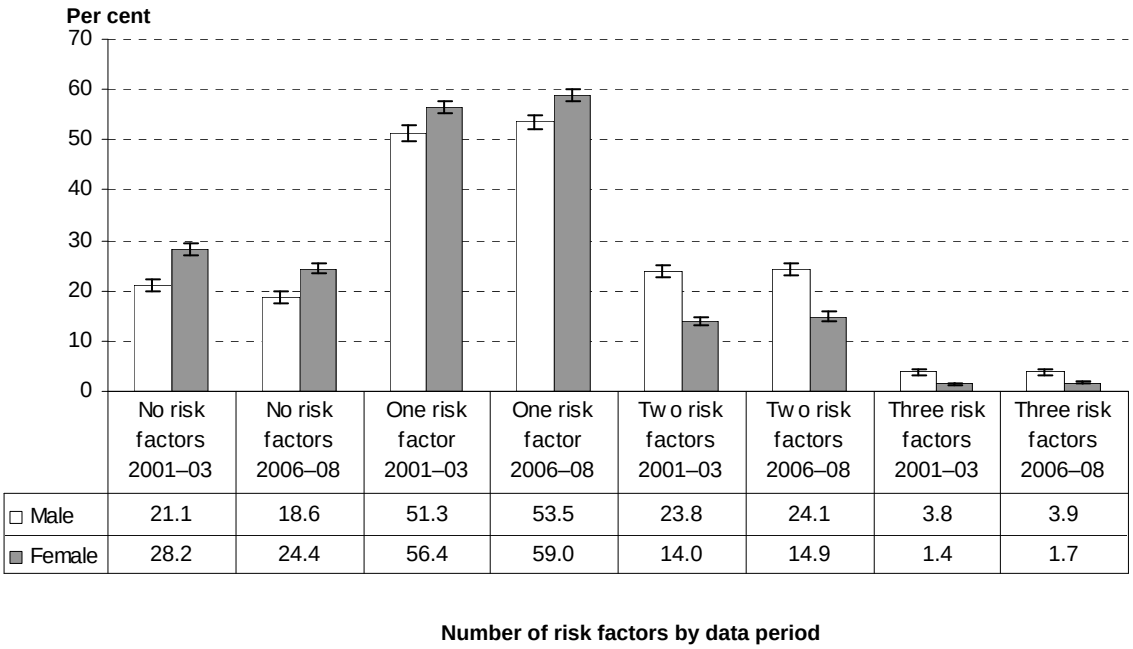
	No risk factors 2001–03	No risk factors 2006–08	One risk factor 2001–03	One risk factor 2006–08	Two risk factors 2001–03	Two risk factors 2006–08	Three risk factors 2001–03	Three risk factors 2006–08
□ CVD encs	25.1	21.8	54.2	56.5	18.2	19.0	2.5	2.7
▩ All BEACH encs	28.2	26.0	48.4	49.9	19.7	20.1	3.7	3.9

Note: CVD—cardiovascular/lipid; encs—encounters.

Figure 9.4: Prevalence of one or multiple risk factors in adult patients at cardiovascular/lipid encounters and all BEACH encounters, 2001–03 and 2006–08 (95% CI)

Figure 9.5 shows that at both times, among patients at cardiovascular/lipid encounters:

- significantly more females than males had no risk factors, or only one risk factor. However, for both sexes, the proportion with no risk factors significantly decreased and the proportion with one significantly increased over time.
- more than half of all patients had one risk factor only (that is, overweight only, obese only, daily smoker only, or at-risk drinker only).
- one-quarter of males and one in seven females had two risk factors, and at both time points, significantly more males than females had two risk factors, although there were no changes over time within either sex group.
- compared with females, males were twice as likely to have all three risk factors at both time points, although there were no within-sex changes over time.



	No risk factors 2001–03	No risk factors 2006–08	One risk factor 2001–03	One risk factor 2006–08	Two risk factors 2001–03	Two risk factors 2006–08	Three risk factors 2001–03	Three risk factors 2006–08
Male	21.1	18.6	51.3	53.5	23.8	24.1	3.8	3.9
Female	28.2	24.4	56.4	59.0	14.0	14.9	1.4	1.7

Figure 9.5: Prevalence of one or multiple risk factors in adult patients at cardiovascular/lipid encounters by patient sex, 2001–03 and 2006–08 (95% CI)

Table 9.7 shows the proportions of patients with each combination of risk factors, by sex.

- Where patients had only one risk factor:
  - males were more likely to be overweight than females
  - females were more likely to be obese
  - females were more likely to have at-risk drinking as their sole risk factor.
- Males were far more likely than females to have two risk factors.
- A greater proportion of males were overweight or obese in combination with at-risk drinking than their female counterparts.
- There was no difference between the sexes for the combination of smoking and at-risk drinking at either time point.

Table 9.7: Prevalence of risk factor combinations for patients at cardiovascular/lipid management encounters, 2001–03 and 2006–08

	Per cent (95% CI)					
	Males		Females		Total	
Risk factors	2001–03 (*n* = 5,296)	2006–08 (*n* = 5,543)	2001–03 (*n* = 6,967)	2006–08 (*n* = 6,895)	2001–03 (*n* = 12,263)	2006–08 (*n* = 12,438)
No risk factors	21.1 (19.9–22.3)	18.6 (17.5–19.6)	28.2 (26.9–29.4)	24.4 (23.3–25.5)	25.1 24.2–26.0)	21.8 (21.0–22.6)
One risk factor	51.3 (49.9–52.7)	53.5 (52.1–54.8)	56.4 (55.1–57.6)	59.0 (57.8–60.2)	54.2 (53.2–55.1)	56.5 (55.6–57.4)
Overweight only	28.8 (27.5–30.1)	28.7 (27.5–29.9)	25.7 (24.6–26.7)	25.6 (24.6–26.7)	27.0 (26.2–27.9)	27.0 (26.2–27.8)
Obese only	15.1 (14.1–16.2)	18.4 (17.4–19.5)	23.2 (22.1–24.3)	25.8 (24.6–26.9)	19.7 (18.9–20.5)	22.5 (21.7–23.3)
At-risk drinker only	5.2 (4.6–5.8)	4.3 (3.7–4.8)	5.7 (5.1–6.3)	5.7 (5.1–6.4)	5.5 (5.0–5.9)	5.1 (4.7–5.5)
Daily smoker only	2.1 (1.7–2.5)	2.1 (1.7–2.5)	1.9 (1.5–2.2)	1.9 (1.5–2.2)	2.0 (1.7–2.2)	2.0 (1.7–2.2)
Two risk factors	23.8 (22.5–25.0)	24.1 (22.9–25.3)	14.0 (13.2–14.9)	14.9 (14.0–15.8)	18.2 (17.5–19.0)	19.0 (18.2–19.8)
Overweight and at-risk drinker	10.5 (9.6–11.3)	10.1 (9.3–10.9)	5.1 (4.6–5.6)	6.2 (5.6–6.8)	7.4 (6.9–7.9)	8.0 (7.4–8.5)
Obese and at-risk drinker	7.0 (6.3–7.8)	7.9 (7.2–8.7)	3.6 (3.1–4.0)	3.7 (3.3–4.2)	5.1 (4.6–5.5)	5.6 (5.2–6.0)
Daily smoker and at-risk drinker	1.4 (1.1–1.7)	1.8 (1.4–2.1)	1.4 (1.1–1.7)	1.3 (1.0–1.6)	1.4 (1.2–1.6)	1.5 (1.3–1.7)
Overweight and daily smoker	2.7 (2.2–3.1)	2.6 (2.2–3.1)	2.0 (1.6–2.3)	1.9 (1.6–2.3)	2.3 (2.0–2.6)	2.3 (2.0–2.5)
Obese and daily smoker	2.2 (1.8–2.6)	1.7 (1.3–2.0)	2.0 (1.6–2.3)	1.7 (1.4–2.1)	2.1 (1.8–2.3)	1.7 (1.5–1.9)
Three risk factors	3.8 (3.3–4.3)	3.9 (3.3–4.4)	1.4 (1.2–1.7)	1.7 (1.4–2.0)	2.5 (2.2–2.8)	2.7 (2.4–3.0)
Overweight, daily smoker and at-risk drinker	2.3 (1.9–2.8)	2.2 (1.8–2.6)	0.7 (0.5–0.9)	0.9 (0.7–1.1)	1.4 (1.2–1.6)	1.5 (1.3–1.7)
Obese, daily smoker and at-risk drinker	1.5 (1.2–1.8)	1.6 (1.3–2.0)	0.7 (0.5–0.9)	0.8 (0.6–1.0)	1.1 (0.9–1.2)	1.2 (1.0–1.4)

Note: CI—confidence interval. Shading indicates significant differences between males and females, or significant changes over time.

9.6 Management of hypertension 2007–08

Hypertension was the most commonly managed problem in general practice (*n* = 9,486) at a rate of 9.9 per 100 encounters in 2007–08 (Figure 9.6). This represents approximately 10.8 million management occasions in general practice for hypertension across Australia in that year.

Patient age and sex

Patients aged 65–74 years were most likely to have hypertension managed (21.1 contacts per 100 encounters) followed by patients aged 75 years and older (20.3 per 100 encounters). There was no difference between the sex-specific management rates for males and females.

Reasons for encounter

The reason for encounter most often given by these patients was cardiac check-up (37.3 per 100 hypertension encounters). Patients also frequently came for prescriptions, the management of stated hypertension, and test results.

Other problems managed

Lipid disorder was the problem most often managed with hypertension (13.1 per 100 hypertension encounters) followed by diabetes (9.8 per 100), oesophageal disease (4.9) and osteoarthritis (4.6).

Medications

The rate of medications prescribed or advised for over-the-counter purchase, or supplied by the GP (96 per 100 hypertension problems) was significantly higher than the average for all problems (68 per 100 problems) in the 2007–08 BEACH year.[3] Medications were prescribed at a rate of 94.2 per 100 hypertension problems. The most common medication prescribed for hypertension was perindopril, given at a rate of 9.3 per 100 hypertension problems, followed by ibersartan (8.0 per 100), ibersartan with hydroclorothiazide (6.6 per 100), and atenolol (6.5 per 100 hypertension problems).

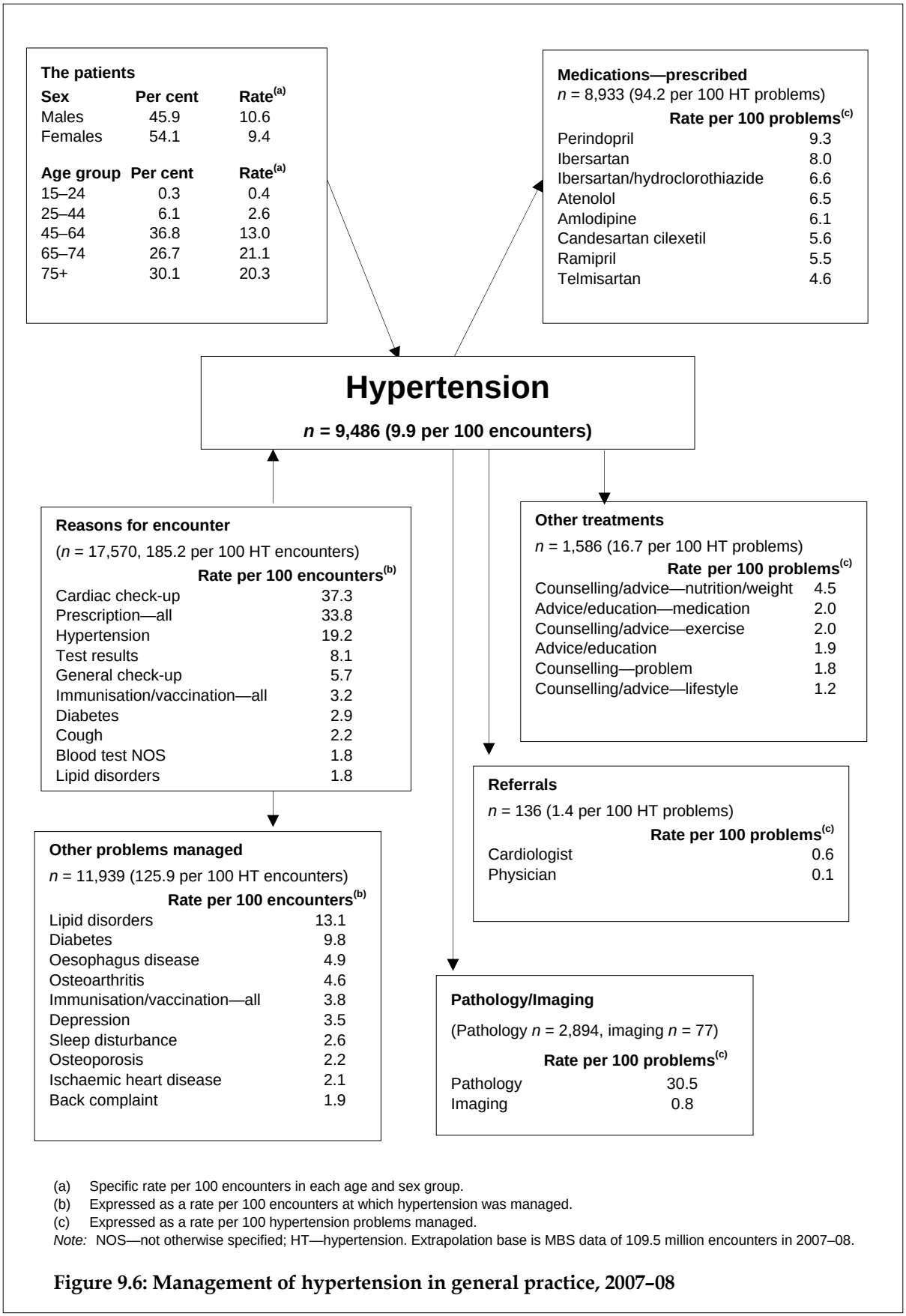
Other treatments

The rate of other treatments provided (including clinical and procedural treatments) was significantly different in the management of hypertension (16.7 per 100 selected problems) than for all problems in BEACH 2007–08 (33.9 per 100).[3] Counselling/advice about nutrition and weight (4.5 per 100 hypertension problems), advice/education about medication (2.0 per 100 problems) and counselling/advice about exercise (2.0 per 100) were the most common clinical treatments provided to patients with hypertension. Procedural treatments were provided at a rate of 1.8 per 100 hypertension problems. Check-up performed by practice nurse and physical function tests were the most commonly performed procedures for hypertension but both were at very low rates (0.5 per 100 problems, respectively).

Referrals and tests ordered

Referrals for hypertension were provided at a rate of 1.4 per 100 problems. This was significantly lower than the average in BEACH 2007–08 (8.3 per 100 problems). The majority of referrals were to a cardiologist (0.6 per 100 hypertension problems).

Pathology tests were ordered at 30.5 per 100 hypertension problems. Lipid tests accounted for 20% of these (at 6.2 per 100 hypertension problem contacts). Imaging tests were ordered at a rate of 0.8 per 100 hypertension problems managed. The majority were chest X-rays (0.2 per 100 hypertension contacts) and echocardiography (0.2 per 100), which accounted for 20% and 18% of orders, respectively.



(a) Specific rate per 100 encounters in each age and sex group.
(b) Expressed as a rate per 100 encounters at which hypertension was managed.
(c) Expressed as a rate per 100 hypertension problems managed.
Note: NOS—not otherwise specified; HT—hypertension. Extrapolation base is MBS data of 109.5 million encounters in 2007–08.

Figure 9.6: Management of hypertension in general practice, 2007–08

9.7 Management of ischaemic heart disease

Figure 9.7 summarises the management of ischaemic heart disease (IHD) in 2007–08. IHD was managed on 1,046 occasions at a rate of 1.1 per 100. This represents about 1.2 million occasions of GP management of IHD across Australia in that year.

Patient age and sex

Patients aged 75 years and older were most likely to have IHD managed (3.3 per 100 encounters), followed by those aged 65–74 years (2.5 per 100). The sex-specific management rate for males (1.6 per 100, 95% CI: 1.4–1.8) was significantly higher than for females (0.7 per 100, 95% CI: 0.6–0.8).

Reasons for encounter

The reason for encounter most often given by patients was for prescriptions (37.2 per 100 IHD encounters), followed by the management of stated IHD, and cardiac check-ups.

Other problems managed

Hypertension was the problem most often managed with IHD (19.2 per 100 IHD encounters) followed by diabetes (12.8 per 100), lipid disorders (10.3) and oesophageal disease (5.9).

Medications

The rate of medications prescribed or advised for over-the-counter purchase, or supplied by the GP in the management of IHD (120 per 100 problems) was almost twice the average for all problems (68 per 100 problems) in the 2007–08 BEACH year.[3] Medications were prescribed at a rate of 116.3 per 100 IHD problems, the most common being clopidogrel (13.5 per 100 IHD problems), followed by aspirin (12.9 per 100), glyceryl trinitrate (12.8 per 100), and atorvastatin (10.2 per 100 problems).

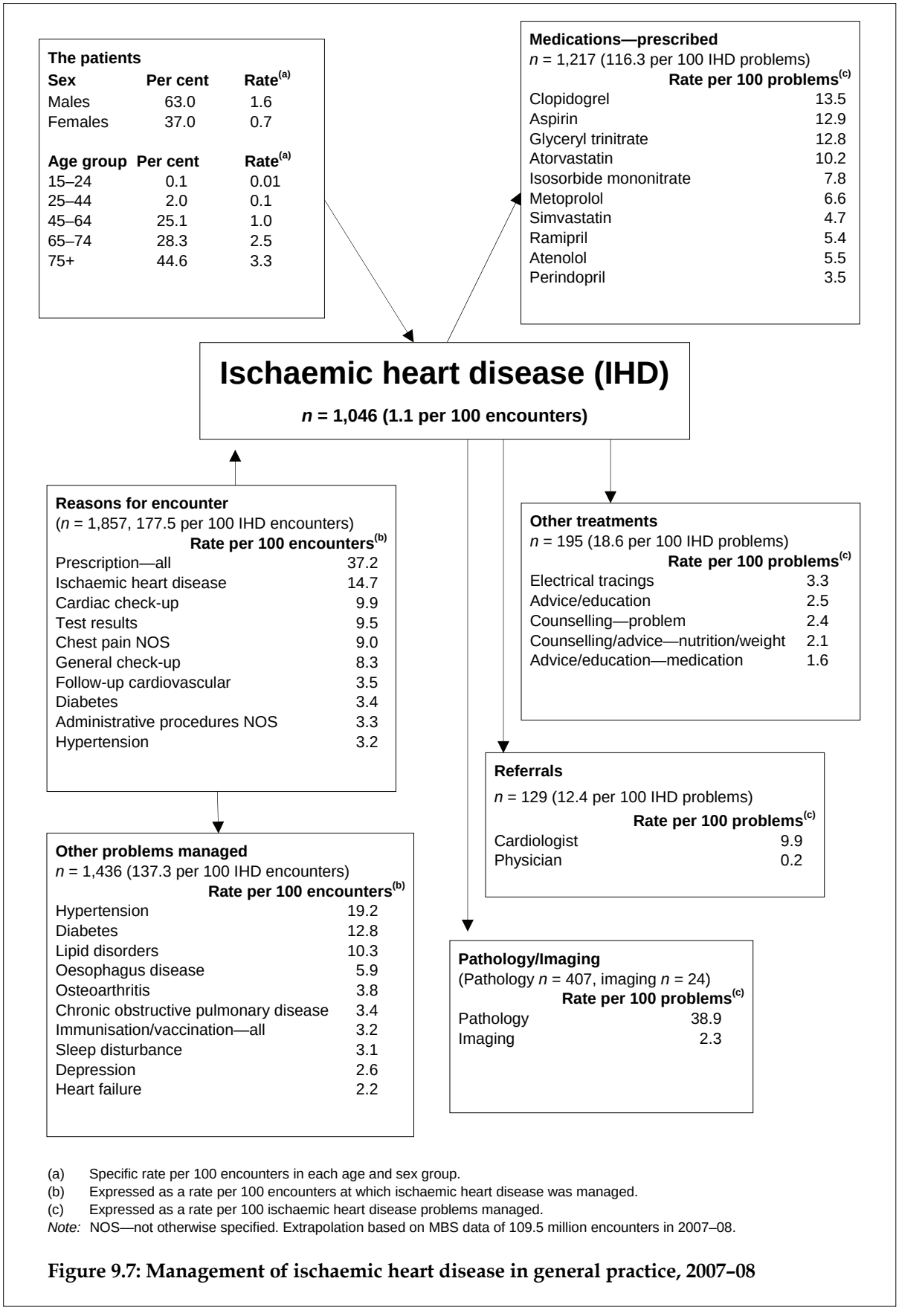
Other treatments

The rate of other treatments provided (including clinical and procedural treatments) was significantly lower in the management of IHD (18.6 per 100 IHD problems) than for all problems in BEACH 2007–08 (33.9 per 100).[3] Advice and education (2.5 per 100 IHD problems), counselling about the problem (2.4 per 100 problems) and counselling/ advice about nutrition/weight (2.1 per 100) were the most common clinical treatments provided. Procedural treatments were used at a rate of 5.8 per 100 IHD problems. Electrical tracings (3.3 per 100 problems) were most common, followed by international normalised ratio tests at 0.9 per 100 IHD problems.

Referrals and tests ordered

Referrals for IHD were provided at a rate of 12.4 per 100 problems. This was higher than the average in BEACH 2007–08 (8.3 per 100 problems).[3] The majority of these were to a cardiologist (9.9 per 100 IHD problems).

Pathology tests were ordered at a rate of 38.9 per 100 IHD problems. Lipid tests accounted for 27% of these, and were ordered at a rate of 10.5 per 100 IHD problem contacts. Imaging tests were ordered at a rate of 2.3 per 100 IHD problems. The majority were chest X-rays (0.8 per 100 hypertension contacts), which accounted for 34% of imaging orders for IHD.



(a) Specific rate per 100 encounters in each age and sex group.
(b) Expressed as a rate per 100 encounters at which ischaemic heart disease was managed.
(c) Expressed as a rate per 100 ischaemic heart disease problems managed.
Note: NOS—not otherwise specified. Extrapolation based on MBS data of 109.5 million encounters in 2007–08.

Figure 9.7: Management of ischaemic heart disease in general practice, 2007–08

9.8 Discussion

These results show the main changes in the management of cardiovascular disease in general practice between 1998–99 and 2007–08. While two time points have been compared, some of the variables examined have been reported elsewhere, showing trends including point estimates (with confidence intervals) in each year of the decade.[14] As the data sample is large, prospective, produced through rigorous methods and with robust confidence intervals, any differences detected can be assumed to represent a true change.

The most evident changes were associated with vascular problems, particularly hypertension and lipid disorders. Problems in the vascular/lipid group accounted for the majority (more than 70%) of all cardiovascular and lipid problems investigated at both time points. The management rate of vascular/lipid problems increased over time for both males and females, and for patients aged 75 years and older. While management increased for patients in this age group, there was a decrease for Repatriation health cardholders, although this was most likely a reflection of the decreased attendance rate of patients with Repatriation health cards overall.[14] The increase in pathology ordering for vascular/lipid problems was most likely associated with the increase in management of lipid disorders, and the increase in management of diabetes as the most common comorbidity. The greatest change in management for vascular/lipid conditions is the increased use statin medications (HMG CoA reductase inhibitors), and uptake of combination products not available in 1998–99.

While there was no change in the overall management rate of cardiac problems, there was an overall decrease in cardiac problem management for patients aged 45 years and older. There were significant decreases in the management rates of ischaemic heart disease and heart failure, and an increase in that for atrial fibrillation. Management changes included an increase in the use of statins, vitamin K antagonists (particularly warfarin), and alpha- and beta-blocking agents.

No discernable changes were found in the management rate of cerebrovascular problems, which in most cases were managed in patients aged 75 years and older. There was also no change in the management rate of stroke/cerebrovascular accident or of other cerebrovascular disease. Management again involved the greatly increased use of statin medications, and a large increase in prescribing of platelet aggregation inhibitors. There was also a significant increase in the rate of antipsycholeptics, quite possibly associated with the high prevalence of dementia in older patients.[25]

Common to the management of all three groups of problems was the increased prescribing rate of HMG CoA reductase inhibitor (statin) medications. The reduction in the management rate of ischaemic heart disease as a cardiac problem, and as a comorbidity with vascular/lipid problems, suggests that the use of these medications may be resulting in better prevention of the progression to these disease states.

It is likely that the significant increase in international normalised ratio (INR) point-of-care testing, also common to all three cardiovascular/lipid problem groups, is associated with the increase in the management rate for atrial fibrillation, and with increased prescribing of Vitamin K antagonists (particularly warfarin) for patients with this condition. In recent years, GPs and cardiologists have been encouraged to aggressively manage atrial fibrillation with warfarin, reducing the risk of death from stroke. The point-of-care testing improves the capacity to monitor these patients, particularly in country areas. This may also have contributed to the lack of change in the management rate of stroke/cerebrovascular accident

where, given the ageing population, it may have been reasonable to expect an increase in this morbidity.

GP selection of medications for the problems managed appear to be in accordance with Therapeutic Guidelines.[8] A more thorough investigation would be required to judge guideline adherence of medications for individual cardiovascular problems, and is out of the scope of this report. The increasing availability of combination products and statins has led to some significant prescribing changes for each of the cardiovascular groups examined. While medication rates may appear low for some of the problems, it is likely that patients are medicated for the condition under management, but were not necessarily provided with a prescription on the day of the recorded consultation, especially where medication is well tolerated and several repeats are provided at the time of prescribing. This is particularly likely with this group of older patients—those most likely to have a cardiovascular condition, and to have chronic comorbidity, leading to more frequent GP visits.

The increased prescribing rate of lipid medications corresponds with an increase in management of lipid disorders, and this may in part reflect the change in PBS criteria, making PBS subsidised statins available to more patients. While the management rate of lipid disorders increased significantly, it should also be considered that such an increase does not necessarily infer an increase in prevalence. Lipid problems are an example of the types of problems people have existed with for many years, but the capacity to detect them has been comparatively recent, and the ability to treat them even more so. As access to medication and other managements for a condition improve, the likelihood of managing that condition is also likely to increase. Similarly, the access to international normalised ratio (INR) point-of-care testing may have allowed more patients to be managed with warfarin.

The uptake of check-ups by practice nurses since the introduction in 2004 of the item number for GPs to claim for this service has had an obvious impact on GP activity. Although not attributable to a specific time point, the increasing availability of point-of-care INR testing for patients on warfarin is also reflected in these data, where the uptake of this procedure was noted for both cardiac and vascular/lipid problems. INR testing is currently not claimable when performed at the practice, and therefore neither is practice nurses involvement, yet practice nurses are increasingly being involved with this procedure (practice nurses were doing INRs at a rate of 4.9 per 100 BEACH encounters in 2007–08).[3]

There is no indication that the chronic disease management MBS items introduced in 2005 affected either the management rate of cardiovascular/lipid problems, or how they are managed by the GP. There were no increased referrals to allied health services for any of the morbidity groups, and a significant decrease in the rate of these referrals for patients with cardiac problems. Other policies and initiatives, while applicable to cardiovascular disease management, do not appear to have resulted in any change in its management. The introduction of the one-off health check item introduced in 2006 for people aged 45–49 years corresponds with a significant increase in the rate of general check-ups[14], but as yet there has been no apparent influence on the management rates of cardiovascular/lipid problems.

The decrease in GP advice about problems has corresponded with an increase in counselling. This may infer that GPs are applying more intensive effort into improving cardiovascular health for these patients. However, what is most apparent from these results is the lack of change over the decade, for patient risk behaviours. There are fewer patients with no risk factors, and more patients with one. This is apparent both in patients with a cardiovascular/lipid problem, and those at all BEACH encounters. Females are more likely to have one risk factor, but only because males are more likely to have two or three.

On a positive note, there are far fewer patients smoking, but over the 7 years examined, neither sex has altered their drinking behaviour—nearly 30% of males and 20% of females drink alcohol at levels considered at-risk. Clearly, there is an increasing weight problem—literally. Considering the chronic nature of the morbidity (often multimorbidity) present in these patients, it would be reasonable to expect a reduction in excess weight. The proportion of both males and females in the normal weight range significantly decreased over this time period, and the corresponding increase was noted in the obese category. For this particular risk factor, women 'outweigh' men.

These results are supportive of the Heart Foundation comment that 'Australians are getting older, heavier and less active, putting themselves at greater risk of cardiovascular disease'.[26] The patients in this study already have diagnosed cardiovascular disease, yet are not changing risk behaviours. Initiatives specific to tackling cardiovascular health may be helpful in the long term, but ultimately it is patients' attitude and willingness to involve themselves in their health care that will make a difference.

Suggested chapter citation

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