A general practice view of cardiovascular disease and diabetes in Australia

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A general practice view of cardiovascular disease and diabetes in Australia

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Summary

This report provides a snapshot of general practice care of cardiovascular conditions, diabetes and some related risk behaviours, and is based on the Bettering the Evaluation and Care of Health (BEACH) program, a study of general practice activity in Australia, for the period April 1998–March 1999.

General practitioners in the BEACH study managed in one year a total of 15,442 cardiovascular problems (11% of all problems), 2,485 diabetes problems (almost 2% of all problems) and 11,329 other cardiovascular risk factor problems (8% of all problems) including hypertension, lipid disorder, overweight and obesity and smoking.

The data in this report represent a baseline against which future patterns in general practice can be compared and, together with other information, will help to interpret trends in cardiovascular disease incidence.

Ischaemic heart disease

GPs managed ischaemic heart disease on 1,488 occasions (1.5 per 100 encounters), amounting to 1.1% of all problems, and 114 (7.7%) of these were new problems (0.1 per 100 encounters). This equates to about 1.6 million encounters for ischaemic heart disease per year and around 119,000 new cases of ischaemic heart disease diagnosed in general practice each year. Patients were predominantly males and most were aged 65 years and above. Co-existing conditions included hypertension, lipid disorder and diabetes. The rates of these conditions in these patients were much greater than the average, pointing to an association between each of them and ischaemic heart disease. To treat this condition GPs relied mainly on medications, which were given at a high rate compared with the average for the study sample, indicating that some of these patients take a combination of medications to control their disease.

Heart failure

Heart failure was managed on 846 occasions (at a rate of 0.9 per 100 encounters), representing 0.6% of all problems managed. Of these, 67 (7.9%) were newly diagnosed cases of heart failure (0.1 per 100 encounters). This equates to about 899,000 encounters for heart failure per year and around 71,000 new cases of heart failure diagnosed in general practice each year. Patients managed for heart failure reflected the total population attending general practice, being 55% female, and the majority were aged 75 years and over. These patients had many comorbidities, hypertension and diabetes being the most common. The rate of diabetes in patients managed for heart failure was far higher than the average, indicating a clear association between both conditions. Medications, pathology tests and imaging were all used more frequently than the average to manage heart failure.

Atrial fibrillation or atrial flutter

There were 554 encounters during which GPs cared for atrial fibrillation or flutter, at a rate of 0.6 per 100 encounters, making up 0.4% of all problems. Among these, there were 34 (6.1%) new problems (0.03 per 100 encounters). This equates to about 589,000 encounters for atrial fibrillation or flutter per year and around 36,000 new cases of atrial fibrillation or flutter diagnosed in general practice each year. Patients managed for this condition were predominantly male and most were 75 years and older. The most common co-existing problems managed were hypertension, heart failure and diabetes. The rates of hypertension

and diabetes were well above average in these patients. Medications and pathology tests were ordered relatively frequently at these encounters compared with the average.

Palpitations

GPs managed palpitations on 139 occasions (rate 0.1 per 100 encounters), representing 0.1% of all problems seen. Of these, 57 (0.4%) were new palpitation problems (0.06 per 100 encounters). This equates to about 148,000 encounters for palpitations per year and around 60,000 new cases of palpitations diagnosed in general practice each year. Most of the patients were female and the highest proportion of patients overall was aged 45–64 years. These patients had a high comorbidity profile, the most frequent other problems managed being hypertension, depression and menopausal complaints. GPs made little use of medications to manage palpitations, preferring to use other treatments, pathology and referrals to specialists and for further tests.

Stroke

GPs managed stroke on 170 occasions, at a rate of 0.2 per 100 encounters, amounting to 0.1% of all problems seen, and 29 (17.0%) of these were new problems (0.03 per 100 encounters). This equates to about 181,000 encounters for stroke per year and around 31,000 new cases of stroke diagnosed in general practice each year. Patients were predominantly male and the largest proportion of patients overall was 75 years and over. The most common comorbidities were hypertension and dementia. Also among the top ten conditions managed with stroke were diabetes, depression, atrial fibrillation or flutter and heart failure. GPs used medications, other forms of treatment, pathology and imaging relatively uncommonly to manage stroke. However, they frequently referred stroke patients to other health professionals and services.

Transient ischaemic attack (TIA)

TIA was managed on 156 occasions, at a rate of 0.2 per 100 encounters, representing 0.1% of all problems. There were 55 new TIA problems (0.1 per 100 encounters), accounting for 35.2% of all TIAs. This equates to about 166,000 encounters for TIA per year and around 58,000 new cases of TIA diagnosed in general practice each year. Patients were more likely to be male and those aged 75 years and over made up the largest proportion. Frequent conditions co-managed with TIA were hypertension, lipid disorder and diabetes. Medication and other forms of treatment were used less frequently than the average but pathology and imaging were ordered at a high rate for TIA.

Type 1 diabetes

GPs managed type 1 diabetes on only 209 occasions (at a rate of 0.2 per 100 encounters), representing 0.1% of all problems, which suggests that a significant proportion of people with type 1 diabetes is cared for by specialists rather than in general practice. This equates to about 222,000 encounters for type 1 diabetes in general practice each year. There were only 4 (1.9%) new cases seen (0.004 per 100 encounters) in the study sample. Male and female patients were in equal proportion and the largest group of them was aged 45–64 years. The most frequent other problems that GPs treated at type 1 diabetes encounters were hypertension, depression and ischaemic heart disease. Urinary disease and heart failure were also among the top ten co-existing conditions. All of these comorbidities were managed with diabetes much more frequently than average, indicating an association between the conditions. Medications (mainly insulins), other forms of treatment and referrals were all used at rates similar to the average but pathology tests were ordered relatively often in the management of type 1 diabetes.

Type 2 diabetes

Type 2 diabetes problems were managed at 2,264 encounters (at a rate of 2.3 per 100 encounters), accounting for 1.6% of all problems recorded. Of these, 129 (5.7%) were new problems (0.1 per 100 encounters). This equates to about 2.4 million encounters for type 2 diabetes per year and around 137,000 new cases of type 2 diabetes diagnosed in general practice each year. Slightly more males than females were managed for type 2 diabetes and the highest proportion of patients was aged 45–64 years. These patients had a high level of comorbidities including hypertension, lipid disorders, ischaemic heart disease and heart failure. All of these comorbidities were much more frequent in patients managed for type 2 diabetes than in the total study sample, showing an association between these conditions and diabetes. GPs used medications and referrals to manage type 2 diabetes at rates similar to the average but other forms of treatment and pathology tests were more frequent.

Gestational diabetes

The number of encounters for gestational diabetes (n=12) in the study sample was extremely low, indicating that this is a rare event medically and that patients with this condition are usually not managed in general practice, being referred to specialists instead. It is impossible to obtain a reliable picture of the care of these patients based on such few observations.

Hypertension

Hypertension was the most common problem in general practice, managed on 7,994 occasions (at a rate of 8.2 per 100 encounters), accounting for 5.7% of all problems managed. Of these, 409 (5.1%) were new diagnoses of hypertension (0.4 per 100 encounters). This equates to about 8.5 million encounters for hypertension per year and around 435,000 new cases of hypertension diagnosed in general practice each year. Most of the patients managed for hypertension were female and the majority of patients were aged over 44 years. The most common comorbidities managed with hypertension were lipid disorders and diabetes. Both of these were above average rates, indicating an association between these conditions and hypertension. The patients managed at these encounters had a higher comorbidity level than average. Medications were used frequently to treat hypertension, highlighting the fact that patients are often given a combination of medications to better manage this condition. GPs hardly ever referred hypertension patients to other health professionals or services, suggesting that hypertension is mostly handled in general practice.

Hypertension in pregnancy

The number of encounters for hypertension in pregnancy in the study sample was extremely low (n=7), indicating that patients with this condition are usually not managed in general practice, being referred to specialists instead. It is impossible to obtain a reliable picture of the care of these patients based on such few observations.

Lipid disorders

Lipid disorders were managed on 2,392 occasions (at a rate of 2.5 per 100 encounters) and represented 1.7% of all problems handled by GPs. New problems constituted 13.1% (0.3 per 100 encounters) of all lipid disorder problems. This equates to about 2.5 million encounters for lipid disorders per year and around 333,000 new cases of lipid disorders diagnosed in general practice each year. Males and females were managed for lipid disorders in equal proportions and the largest proportion of patients was aged 45–64. Hypertension was a very frequent co-existing problem with lipid disorders. Diabetes was also relatively common in these patients. Both these comorbidities were well above the average rate. Medications were

used at a below average rate to treat lipid disorders but other forms of treatment and pathology tests were very common. GPs only occasionally referred patients managed for lipid disorders to other health professionals and services, including dieticians and nutritionists.

Cardiovascular check-up

GPs conducted cardiovascular check-ups on 1,204 occasions (rate 1.2 per 100 encounters), amounting to 0.8% of all problems managed, and 101 (8.4%) of the total were new cases (rate 0.1 per 100 encounters). This equates to about 1.3 million encounters for cardiovascular check-ups per year. Most patients undergoing a cardiovascular check-up were in the 45 years and over age range and were women. Medications, other forms of treatment, pathology tests and referrals were used after a cardiovascular check-up at rates considerably below average. A relatively large proportion of patients being examined for the first time was aged 25–44 years. This indicates significant awareness among both patients and GPs of the importance of prevention and monitoring of cardiovascular disease from a younger age.

Overweight and obesity

Overweight and obesity problems were managed at 668 encounters (at a rate of 0.7 per 100 encounters), accounting for 0.5% of all problems seen. Compared with the prevalence of overweight and obesity among general practice patients in the study (51%), the rate of management of this problem is very low. New problems represented 107 (16.0%) of all overweight and obesity problems (0.1 per 100 encounters). This equates to about 710,000 encounters for overweight and obesity problems per year and around 114,000 new cases of overweight and obesity diagnosed in general practice each year. Although the prevalence of overweight and obesity in general practice patients is higher in males, females made up the vast majority of patients treated for this problem. Patients were largely in the 25–44 and 45–64 year ranges. The most frequent comorbidities managed were hypertension, lipid disorders, depression and diabetes. The rates of hypertension and diabetes in these patients were double the average for the total data set, indicating a strong association between the conditions. Advice on nutrition, weight and exercise was the main form of treatment provided. Overall, referrals to other health professionals, including dieticians and nutritionists, were much lower than might have been expected in these cases.

Smoking

GPs managed smoking on 275 occasions (0.3 per 100 encounters), which represents 0.2% of all problems. The rate of management of smoking appears quite low, given that almost one in five GP encounters with adults are with daily smokers. New problems accounted for 71 (25.8%) of all smoking problems (0.1 per 100 encounters). This equates to about 292,000 encounters at which smoking is managed per year and around 75,000 new cases of smoking problems treated in general practice each year. Slightly more males than females were managed for smoking problems and most patients were aged 25–44. The data suggest that in about half these encounters the management of smoking was instigated by the patient and in the other half it was opportunistic care initiated by the GP. The most frequent conditions managed with smoking problems included upper respiratory tract infections, hypertension and depression. To treat this problem, GPs mainly gave patients advice on smoking. Generally GPs themselves treated patients for smoking as the referral rate was very low.

Peripheral vascular disease

Peripheral vascular disease was managed at 215 encounters, at a rate of 0.2 per 100 encounters, amounting to 0.1% of all problems managed. Forty-five (20.9%) of these were

new problems (0.05 per 100 encounters). This equates to about 228,000 encounters for peripheral vascular disease per year and around 48,000 new cases of peripheral vascular disease diagnosed in general practice each year. Patients treated for this condition were more likely to be male and most patients were aged 65 years and over. These patients had a high comorbidity level. The problems that GPs managed most frequently with peripheral vascular disease were hypertension, diabetes, lipid disorders and ischaemic heart disease. The rates of all these comorbidities were much higher than average, indicating an association between the conditions and peripheral vascular disease. Medications, other forms of treatment and pathology tests were all used at below average rates to manage this condition. However, imaging and referrals to specialists and other health services occurred relatively often.

Introduction

Cardiovascular disease is Australia's largest health problem. Around 2.8 million Australians, 16% of the population, suffer from a cardiovascular condition and in 1998 almost 51,000 people died as a result. Cardiovascular disease represented an estimated 22% of the disease burden in Australia in 1996, 33% of premature deaths and 9% of years of healthy life lost through disease, impairment and disability (AIHW 2001).

Eighty-five per cent of the population visit a general practitioner at least once in any one year, with a median number of five visits per person (Royal Australian College of General Practitioners 1998). GPs provide a range of services spanning from prevention of illness through to treatment and rehabilitation (Royal Australian College of General Practitioners 1998). GPs are usually the first port of call for a health problem and the coordinators of health care for most people.

This report provides a snapshot of general practice care of cardiovascular conditions, diabetes and some related risk behaviours, and is based on a study of general practice activity in Australia, the BEACH program. Cardiovascular disease refers to all conditions involving the heart and blood vessels. In Australia, the forms of cardiovascular disease that pose the largest threats are ischaemic heart disease, stroke, heart failure and peripheral vascular disease. Among the main risk factors for cardiovascular disease are hypertension, tobacco smoking, lipid disorders, overweight and obesity, atrial fibrillation and diabetes. The nature of each of these problems is defined briefly in subsequent chapters of this report, along with a description of the patients presenting to general practice with these problems and the care given by GPs to these patients.

Throughout this report, comparison is made with numbers and rates for the whole BEACH study sample for the period April 1998–March 1999. These are shown in Table 1 for easy reference (Britt et al. 1999b).

Table 1: Summary of morbidity and management for the whole BEACH study sample, April 1998–March 1999

Variable	Number	Rate per 100 encounters	Rate per 100 problems
General practitioners	984	. .	. .
Encounters	96,901	. .	. .
Reasons for encounter	141,766	146.3	. .
Problems managed	140,824	145.3	. .
Medications	106,320	109.7	75.5
Other treatments	41,839	43.2	29.7
Referrals	10,860	11.2	7.7
Pathology	23,872	24.6	17.0
Imaging	6,844	5.2	3.7

. . Not applicable

General practitioners in the BEACH study managed in one year a total of 15,442 cardiovascular problems (11% of all problems), 2,485 diabetes problems (almost 2% of all problems) and 11,329 other cardiovascular risk factor problems (8% of all problems) including hypertension, lipid disorder, overweight and obesity and smoking. Table 2 puts

the problems analysed here in the context of all problems managed by general practitioners in the study.

Table 2: Distribution of selected cardiovascular problems and risk factors in general practice consultations

Problem	Number	Per cent of all problems managed in general practice
Hypertension*	7,994	5.7
Diabetes*	2,485	1.8
Lipid disorder	2,392	1.7
Ischaemic heart disease*	1,488	1.0
Cardiovascular check-up*	1,204	0.8
Heart failure	846	0.6
Overweight and obesity*	668	0.5
Atrial fibrillation or atrial flutter	554	0.4
Smoking	275	0.2
Peripheral vascular disease	215	0.1
Stroke	170	0.1
Transient cerebral ischaemia	156	0.1
Palpitations	138	0.1
All problems	**140,824**	**100**

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix A1).

The patients at encounters where a cardiovascular problem was managed in general practice were predominantly females (56.2%). The majority of patients were aged 45 years and over (Table 3).

Table 3: Patients at encounters where cardiovascular problems were managed

Age	Males	Females
	Per cent	
0–14	0.3	0.3
15–24	0.4	0.6
25–44	4.1	4.8
45–64	16.1	17.9
65–74	12.4	14.9
75+	10.4	17.7
All	**43.7**	**56.2**

The data in this report represent a baseline against which future patterns in general practice can be compared and, together with other information, will help to interpret trends in cardiovascular disease incidence. These data may also be useful in the development of guidelines for general practice care of patients with cardiovascular conditions and diabetes, and will help to guide the allocation of resources to improve practice.

Methods

This report is based on analysis of data collected for the period April 1998 to March 1999 as part of the *Bettering the Evaluation and Care of Health* (BEACH) study, a study of general practice activity in Australia. The methods adopted in the BEACH program have been described in detail elsewhere (Britt et al. 1999a). Briefly, each of a random sample of approximately 1,000 recognised GPs per year records details of about 100 doctor–patient encounters of all types on structured paper encounter forms.

The source population includes all recognised GPs who have claimed a minimum of 375 general practice Medicare items (items 1–51) in the most recently available three-month Health Insurance Commission data period. This equates to 1,500 Medicare claims a year and ensures the majority of part-time GPs are included while excluding those who are not in private practice but claim for a few consultations a year. The General Practice Branch of the Commonwealth Department of Health and Aged Care (DHAC) draws a sample for the BEACH study every three months (Britt et al. 1999b).

The randomly selected GPs are approached by letter with telephone follow-up. GPs who agree to participate are set an agreed recording date and sent a research pack. The pack contains a covering letter, a project information sheet, a GP profile questionnaire, a pad of 105 recording forms (to allow for some error), a detailed set of instructions, a height and weight measure conversion chart, a sample completed form with explanation, a 'standard drinks' chart to help patients answer questions on alcohol intake, a reply-paid envelope and several copies of a patient information sheet. The patient information sheet gives patients the choice to 'opt out' and not have details of their consultation included in the study. A telephone reminder is made to each GP in the first days of the agreed recording period. Non-returns are followed up by regular telephone calls.

Each participating GP earns 25 audit points towards their quality assurance requirements and receives an analysis of their own results compared with those of nine other unidentified practitioners who recorded at approximately the same time. GPs also receive educational material on the identification and management of patients who smoke or consume alcohol at hazardous levels.

Data recorded

BEACH includes three inter-related data collections: encounter data, GP characteristics and patient health status. An example of the form used to collect the encounter data and the data on patient health status is included as Appendix 1. The GP characteristics section is beyond the scope of this report.

Encounter data include information about the consultation itself:

- date of consultation;
- type of consultation (direct, indirect);
- Medicare item number (where applicable);
- specified other forms of payment; and
- clinical services provided at indirect encounters.

Patient data include:

- date of birth;
- gender;
- status to the practice (new/seen before);
- postcode of residence;
- health care card status (yes/no);
- Veterans' Affairs status (Gold/White);
- non-English-speaking background (yes/no);
- Aboriginal (yes/no) (self-identification);
- Torres Strait Islander (yes/no) (self-identification); and
- patient reasons for encounter (up to three).

The **content of the encounter** is described in terms of the problems managed and the management techniques applied to each of these problems. Data elements include:

- up to four diagnoses/problems;
- status of each problem (new to patient/managed before); and
- whether it was thought to be work-related.

Management data for each problem include medications and non-pharmacological treatments. Data on **medications** comprise:

- up to four medications per problem;
- whether medication prescribed, over the counter advised or supplied by the GP;
- brand name;
- form (where required);
- strength;
- regimen;
- status (new medication for this problem and this patient/continuation); and
- number of repeats.

Non-pharmacological management of each problem includes:

- counselling;
- therapeutic procedures;
- new referrals to specialists, allied health professionals or for hospital admission (up to 2 per problem);
- pathology tests ordered (up to 5 per problem); and
- imaging ordered (up to 5 per problem).

Supplementary analysis of nominated data (SAND): The study also investigates specific aspects of patient health or health care delivery in general practice not covered by the consultation-based information. However, this section is not investigated in this report.

Coding systems are given in the appendix and data elements are explained in the glossary (Britt et al. 1999b).

Statistical analysis

Analysis of the BEACH data was done with SAS version 6.12 (1996). Analytical techniques that consider the cluster sampling design of this study were used. The standard error calculations used to estimate 95% confidence intervals incorporate both the single-stage clustered study design and sample weighting according to Kish's description of the formulae (Kish 1965).

Proportions (%) are used when describing the distribution of an event that can arise only once at a consultation (e.g. age, gender or item numbers) or to describe the distribution of events within a class of events (e.g. problem A as a % of total problems).

Rates per 100 encounters are used when an event can occur more than once at the consultation (e.g. reasons for encounter, problems managed). Rates per 100 problems are used when a management event can occur more than once per problem managed (e.g. prescribed medications, orders for pathology). In general, the results presented are the number of observations (n) and the rate per 100 encounters or rate per 100 problems.

Analysis of data was generally restricted to those problems for which there were at least 100 encounters recorded in the period under study. Where the number of encounters is very low, as with new cases of some of the problems analysed, results should be interpreted with caution as they may be inaccurate. This has been indicated wherever it applies.

Classification of data

Patient reasons for encounter, problems managed, therapeutic procedures, other non-pharmacological treatments, referrals, and pathology and imaging ordered are coded using ICPC-2 PLUS (Britt 1997). This is an extended vocabulary of terms classified according to the International Classification of Primary Care (Version 2) (ICPC-2), a product of the World Organization of Family Doctors (WONCA) (Classification Committee of the World Organization of Family Doctors 1997). The ICPC is regarded as the international standard for data classification in primary care. Sections of ICPC-2 PLUS relevant to the results presented in this report appear in Appendixes 2, 3, 4, 5 and 6.

Pharmaceuticals prescribed or provided and over the counter medications advised by the GP are coded and classified according to a classification developed by the Family Medicine Research Centre at the University of Sydney, the Coding Atlas for Pharmaceutical Substances (CAPS). This is a hierarchical structure that facilitates analysis of data at a variety of levels—for example, medication class, medication group, generic composition and brand name. CAPS is mapped to the Anatomical Therapeutic Chemical classification (WHO Collaborating Centre for Drug Statistics Methodology 1998), which is the Australian standard for classifying medications at the generic level. The CAPS classification appears in Appendix 7 (Britt et al. 1999b).

Representativeness of the BEACH sample

There was no statistically significant difference between participating and non-participating GPs in terms of gender, place of graduation and the Rural Remote Metropolitan Area (RRMA) classification. However, GPs aged less than 35 years were statistically significantly

under-represented in the participant population. There was also a small but statistically significant difference in activity level between participants and non-participants. The distribution of GPs by State differed significantly as well, a greater proportion of participants coming from the eastern States, the Australian Capital Territory and the Northern Territory (Britt et al. 1999b).

Comparison of BEACH participants and all recognised general practitioners in Australia who claimed more than 1,500 general practice Medicare item numbers in 1998–99 revealed no statistically significant differences for GP gender, mean activity level or place of practice (RRMA and State). However, BEACH participants were statistically significantly less likely to be under 35 years of age and more likely to have graduated in Australia.

Comparison of the age–sex distribution of patients at the consultations recorded in BEACH with that of patients seen in all general practice consultations claimed on Medicare for the same period showed that the only major difference was that the BEACH study included a greater proportion of events with men aged 75 years and over than the national distribution (Britt et al. 1999b).

The data set

Weights were applied to the study sample to take account of the difference in age between BEACH GPs and all GPs in Australia. Simply, GPs aged less than 35 years were given greater weighting than GPs of other age groups. This increases the contribution of the encounters from these GPs to any national estimate.

Weights were also applied to the sample to take account of the number of services that a GP provides in a year. Greater weighting was given to encounters from GPs who provided more services per year than to those from GPs who provided less, as the former make a greater contribution to any national estimate of activity than the latter. The final sample weights were a multiplicative function of the GP age weighting and GP sampling fraction of services in the previous 12 months.

The final data set contained 96,901 encounters, 141,766 reasons for encounters, 140,824 problems managed and 106,320 medications (Table 4) (Britt et al. 1999b).

Table 4: The BEACH data set

Variable	Raw	Weighted
GPs	984	984
Encounters	98,400	96,901
Reasons for encounter	145,407	141,766
Problems managed	145,183	140,824
Medications	107,451	106,320
Other treatments	44,076	41,839
Referrals	11,615	10,866
Imaging	7,299	6,844
Pathology	25,727	23,872

Limitations of BEACH

General practitioners participating in this survey are all recognised GPs who work in private practice on a fee-for-service basis. No salaried practitioners in either the public or private sector are included.

The study provides a cross-sectional view of the management of problems in general practice. It tells us the sort of problems and issues GPs encounter and how they deal with them. No conclusions can be drawn in terms of disease episodes, nor in terms of long-term treatment of patients with chronic conditions because the survey is not patient-based and individual records are not linked. Therefore it would be invalid to compare patterns observed with accepted good clinical practice, and we have made no attempt to do this in this report.

The survey is largely an encounter-based study of the patients for whom a general practice service is provided. Although the term 'patients' is used for convenience in this report, the correct description is 'patient encounters'. The morbidity patterns reflect only the problems managed during the recorded encounters. There may be other comorbidity managed at other encounters outside the recording period that would therefore not be included in the database.

Prescription and medications advised or provided include only those medications that were prescribed, given or advised for over-the-counter purchase during the course of the recorded encounter. If a prescription was not provided for a given problem it does not necessarily mean that the patient was not already taking medication for the problem or that it may be given at a subsequent encounter for the same problem. Similarly, the absence of a procedure or a referral does not preclude the possibility that these events occurred at a prior encounter or might happen at a subsequent encounter.

Medication status was not well recorded by GPs for the 12 months of data analysed. Therefore, where these data are presented, the extent of missing values is given and the denominators have been adjusted accordingly to give an appropriate estimate of the proportion of new medications used.

Heart problems

Ischaemic heart disease

Ischaemic heart disease is caused by lack of oxygen in the heart muscle. This results from atherosclerosis (a thickening or hardening of the walls of a blood vessel) of the coronary arteries which supply the heart with blood. The manifestations of ischaemic heart disease can range from asymptomatic disease to acute myocardial infarction and sudden cardiac death. It is the commonest form of heart disease and the single most important cause of death in Australia. Preventable risk factors for ischaemic heart disease include tobacco smoking, hypertension, high blood cholesterol, diabetes, a sedentary lifestyle and being overweight. Men and older people are at greater risk of the disease. The excess risk multiplies when there is more than one risk factor present. Investigation of ischaemic heart disease in general practice would usually involve resting electrocardiogram (ECG) and possibly exercise stress ECG. Continuous ambulatory (Holter) electrocardiography and imaging tests such as echocardiography, perfusion scanning and coronary angiography may be done also in patients with suspected or known disease. Effective strategies to manage patients with ischaemic heart disease are reduction of risk factors and use of medications including aspirin, beta blockers, calcium channel blockers, ACE-inhibitors and cholesterol lowering agents (NHMRC 1997b, Edwards et al. 1998, AIHW 2001, DHAC & AIHW 1999).

Angina is a clinical syndrome characterised by a deep, poorly localised chest or arm discomfort that is associated with physical exertion or emotional stress and relieved by rest or sublingual nitrates. It is caused by transient lack of oxygen in the heart muscle resulting from a blockage in one or more of the coronary arteries which supply the heart with blood. Investigation of this problem at the primary care level would usually involve resting electrocardiogram (ECG) and exercise stress ECG. Imaging tests such as echocardiography, perfusion scanning and coronary angiography may be done as well. As with all patients with ischaemic heart disease, reduction of risk factors is very important. Effective medications used to manage angina include aspirin, nitrates, beta blockers and calcium channel blockers (NHMRC 1997b, Edwards et al. 1998).

GPs managed ischaemic heart disease on 1,488 occasions (1.5 per 100 encounters), amounting to 1.1% of all problems. Among these there were 114 (7.7%) new problems (0.1 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 1.6 million encounters for ischaemic heart disease per year and around 119,000 new cases of ischaemic heart disease diagnosed in general practice each year. Figure 1 summarises the most frequent observations for all encounters at which ischaemic heart disease was treated compared with those for new ischaemic heart disease diagnoses.

Patients managed for this problem were predominantly males (57.8%). The bulk of patients were aged 65 years and above (74.8%). About 16% were from non-English-speaking background (NESB) and 0.8% were from Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of encounters for ischaemic heart disease in the NESB or Indigenous populations compared with all patients (1.6, 1.0 and 1.5 per 100 encounters respectively).

Of the 2,699 reasons recorded for these encounters, the most common were ischaemic heart disease (26.5 per 100), prescription requests for any condition (23.4 per 100 encounters),

cardiac check-up (16.1 per 100) and chest pain (12.7 per 100). General check-up, hypertension and diabetes were also mentioned often.

Co-existing conditions frequently managed at these encounters included hypertension (14.9 per 100 ischaemic heart disease encounters), lipid disorder (9.3 per 100) and diabetes (8.2 per 100). The rates of these conditions in patients managed for ischaemic heart disease were much greater than the average, pointing to an association between each of them and ischaemic heart disease. Oesophageal disease, heart failure and depression also featured among the top ten problems managed with ischaemic heart disease.

To treat this condition GPs gave medications at a high rate (129.4 per 100 problems) compared with the average for the study sample, indicating that some of these patients take a combination of medications to control their disease. A variety of medication types were among the top ten including nitrates (glyceryl trinitrate, isosorbide nitrate), antiplatelet agents (aspirin), beta blockers (atenolol, metoprolol), diuretics (frusemide), inotropes (digoxin), calcium channel blockers (diltiazem), and lipid-lowering agents (simvastatin). Of all medications given for ischaemic heart disease, nitrates represented 34.3%, calcium channel blockers 13.5%, antiplatelet agents 10.4%, beta blockers 9.4%, ACE-inhibitors 7.3%, statins 5.8%, diuretics 5.2%, inotropes 3.8% and antiarrhythmics 2.2%.

GPs relied much less on other forms of treatment for ischaemic heart disease (13.9 per 100 problems). These mainly took the form of counselling about the problem, performing electrical tracings and providing advice on medication and lifestyle issues.

Pathology tests were requested at a rate of 22.2 per 100 problems. The tests ordered most frequently were for lipids (5.9 per 100), full blood count (3.6 per 100), electrolytes/ urea/creatinine (3.5 per 100) and liver function (2.6 per 100). Imaging was rarely used to investigate ischaemic heart disease (2.0 per 100 problems).

Referrals to other health professionals and services occurred at a rate of 11.6 per 100 problems. These were principally to cardiologists (6.6 per 100) and for electrocardiography (2.7 per 100).

Most new cases of ischaemic heart disease were among those aged 65–74 years (45.0%) and occurred in males (59.4%). The reasons recorded most often for these patients seeking GP attention were chest pain (44.8 per 100 encounters), ischaemic heart disease (23.0 per 100), cardiac check-up (9.0 per 100), shortness of breath (5.7 per 100) and lipid disorder (5.7 per 100). As with all patients managed for this condition, the other diseases most commonly treated in newly diagnosed cases were hypertension (14.0 per 100 problems), lipid disorder (10.6 per 100) and diabetes (5.3 per 100). Medications were used for new cases at a lower rate (81.6 per 100 problems) than for all problems but the range of medications given most often was similar. In contrast, other treatments were more common for new problems (36.8 per 100 problems) and involved mainly performing electrical tracings. Likewise, pathology investigations were much more frequent in newly diagnosed problems (65.8 per 100 problems), including mostly full blood count, tests for lipids and cardiac enzymes. Imaging was ordered at a rate of 10.5 per 100 problems. GPs commonly referred new cases of ischaemic heart disease (54.4 per 100 problems), mainly to cardiologists or for electrocardiograms.

Patients

	Per cent
Male	57.8
Female	42.2
Age	
<1–14	0.1
15–24	0.1
25–44	2.6
45–64	22.4
65–74	33.5
75+	41.3
Origin	
NESB	15.8
A&TSI	0.8

Reasons for encounter

	All	New
	n 2,699	n 192
	Rate[(a)]	
Ischaemic heart disease	26.5	23.0
Prescription all*	23.4	4.9
Cardiac check-up*	16.1	9.0
Pain, chest NOS	12.7	44.8
General check-up*	9.5	4.6
Hypertension*	5.4	4.2
Immunisation all*	4.6	2.6
Diabetes*	3.6	1.7
Shortness of breath	2.9	5.7
Lipid disorder	2.8	5.7

Other problems managed

	All	New
	n 1,902	n 108
	Rate[(a)]	
Hypertension*	14.9	14.0
Lipid disorder	9.3	10.6
Diabetes*	8.2	5.3
Immunisation all*	5.0	4.5
Oesophageal disease	4.4	2.0
Osteoarthritis*	3.9	2.3
Heart failure	3.5	1.7
Depression*	2.9	0.9
Asthma	2.5	4.9
Sleep disturbance	2.5	1.7

Medications

	All	New
	n 1,926	n 93
	Rate[(b)]	
Glyceryl trinitrate	23.8	26.5
Isosorbide nitrate	19.9	16.7
Aspirin	13.0	9.3
Atenolol	6.5	3.8
Frusemide	5.9	3.2
Diltiazem anti-angina	5.6	2.5
Diltiazem anti-hypertens	5.1	2.0
Digoxin	4.9	0.0
Metoprolol	4.9	2.3
Simvastatin	4.5	0.0

ISCHAEMIC HEART DISEASE

N = 1,488

(1.1% of all problems managed)

New problems = 114

(7.7% of all ischaemic heart disease problems)

Other treatments

	All	New
	n 208	n 42
	Rate[(b)]	
Electrical tracings	3.9	23.3
Counselling — problem	2.2	4.7
Advice medication	1.9	0.9
Advice/education	1.0	2.4
Advice treatment	0.8	2.0
Advice exercise	0.7	0.0
Advice nutrition/weight	0.7	0.0
Observe/wait	0.4	1.0
Advice health/body	0.4	0.0
Advice smoking	0.4	0.0

Pathology

	All	New
	n 331	n 75
	Rate[(b)]	
Lipids	5.9	8.5
Full blood count	3.6	10.5
EUC	3.5	8.4
Liver function	2.6	6.2
Cardiac enzymes	1.8	10.4
Glucose tolerance	1.5	6.7
Coagulation	1.0	0.0
Multibiochemical tests	0.5	1.6
Other test NEC	0.4	0.0
Hepatitis serology	0.3	2.9

Imaging

	All	New
	n 30	n 12
	Rate[(b)]	
X-ray; chest	1.3	8.2
Echocardiography	0.3	1.4
Imaging other	0.1	0.3
Angiography; coronary	0.1	0.0

Referrals

	All	New
	n 173	n 62
	Rate[(b)]	
Cardiologist	6.6	28.5
ECG	2.7	17.3
Hospital admission	0.9	6.2
Other health profess	0.3	0.0
Specialist	0.3	1.0
Physician	0.2	0.9
Occupational therap	0.1	0.0
Holter monitor	0.1	0.0
Neurologist	0.1	0.0
Speech therapist	0.1	0.0

(a) Rate per 100 ischaemic heart disease encounters.

(b) Rate per 100 ischaemic heart disease problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 1: Ischaemic heart disease

Heart failure

Heart failure refers to inability of the heart to pump blood well enough to meet the body's normal needs. Coronary heart disease, hypertension, idiopathic cardiomyopathy, a damaged heart valve, excessive alcohol intake, certain medications or thyroid disease can lead to heart failure. It tends to affect older people and often causes prolonged disability. The prevalence of heart failure in Australia is not known but in the USA it is estimated as 0.8% overall, increasing dramatically with age to about 8% of people aged 80 and over. The condition accounts for almost 3,000 deaths each year in Australia (DHAC & AIHW 1999, Davis et al. 2000).

Heart failure is difficult to diagnose clinically and investigations such as chest X-rays, electrocardiography and echocardiography can assist. Laboratory tests recommended for diagnosis include routine haematology and biochemistry, liver function and thyroid function. Recommended management measures include: advising on disease and treatment; addressing risk factors (smoking, alcohol, lipid disorders, diabetes, hypertension); correcting electrolyte imbalances; addressing salt content of diet, fluid restriction and weight monitoring; advising moderate exercise; modifying nutrition; and considering influenza and pneumococcal vaccinations to prevent lung infections that can exacerbate heart failure. Medication therapy is the mainstay of management of this problem. Standard treatment includes ACE-inhibitors, diuretics and digoxin, and sometimes adding a beta blocker. GPs have a vital role in the early detection and treatment of the main risk factors for heart failure: hypertension and ischaemic heart disease, thus reducing the progression to symptomatic heart failure, and in the monitoring of patients with established heart failure (Davies et al. 2000, Hobbs et al. 2000, Gibbs et al. 2000, Pavia et al. 1999).

Heart failure was managed on 846 occasions (at a rate of 0.9 per 100 encounters), representing 0.6% of all problems managed. Of these, 67 (7.9%) were newly diagnosed cases of heart failure (0.1 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 899,000 encounters for heart failure per year and around 71,000 new cases of heart failure diagnosed in general practice each year. Figure 2 summarises the most frequent observations for all encounters at which heart failure was treated compared with those for new heart failure diagnoses.

The patients managed for heart failure reflected the total population attending general practice, being 55.2% female. As would be expected, the majority of patients (63.9%) were aged 75 years and over. Fourteen per cent were from non-English-speaking background and 1.6% from Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of heart failure encounters in the NESB or Indigenous populations compared with all patients (0.8, 1.2 and 0.9 per 100 encounters respectively).

A total of 1,512 patient reasons for encounter were recorded at the 846 encounters where heart failure was treated. This represents a rate of 178.7 per 100 encounters, which is considerably higher than average. Heart failure was the most common reason (25.6 per 100 heart failure encounters), followed by shortness of breath (17.9 per 100) and requests for medication, not necessarily for heart failure (17.6 per 100). Request for a cardiac check-up (12.8 per 100) and ankle swelling/oedema (8.6 per 100) were also frequent reasons for encounter.

Hypertension (10.3 per 100 heart failure encounters) and diabetes (9.4 per 100) were the most common conditions treated with heart failure. The rate of diabetes in patients managed for heart failure is far higher than the average, indicating a clear association between both conditions. Chronic obstructive pulmonary disease, atrial fibrillation or flutter, ischaemic heart disease without angina and vaccinations were also among the top ten other problems

cared for with hypertension. Overall, GPs treated 1,015 other problems during heart failure encounters. The rate of total problems managed at these encounters (219.9 per 100 encounters) was far higher than average, indicating that these patients had many comorbidities.

Medications were used frequently to treat heart failure compared with the average, at a rate of 137 per 100 problems. At the generic level, several types of medications were among the top ten including diuretics (frusemide given at almost 50% of problem contacts), inotropes (digoxin), potassium supplements, ACE-inhibitors (captopril, enalapril, lisinopril, perindopril, quinapril), nitrates and aspirin. For the 75% of heart failure encounters where GPs recorded medication status, 15.7% were new medications—that is, they were used for the first time to treat heart failure in these patients. Of these new medications, frusemide was the most commonly used (31.7% of all new medications given for heart failure).

GPs used other forms of management for heart failure problems at a much lower rate (13.9 per 100 problems) than medication. These included mainly advice on medication (5.0 per 100) and treatment (3.4 per 100) and electrical tracings (2.0 per 100).

Pathology tests were ordered for heart failure at a rate of 28.1 per 100 problems, which is above the average for the total study sample. Electrolytes/urea/creatinine analyses were the most common (10.1 per 100), reflecting the widespread use in these patients of diuretics, which are often associated with electrolyte imbalance and the need to monitor the effect of ACE-inhibitors on urea and creatinine levels. Full blood count, liver function and thyroid function were also among the top ten tests requested.

Imaging was used to investigate heart failure at a rate of 7.1 per 100 problems, which is above the average for the study. Chest X-rays (6.0 per 100) accounted for 84% of imaging tests. GPs ordered echocardiography sparingly (0.6 per 100) in heart failure cases overall.

GPs referred heart failure patients to other health professionals or services on few occasions (5.2 per 100 problems). Referrals were mainly to cardiologists and for hospital admission.

New cases of heart failure occurred more often among males (54.5%) and among people aged 75 years and over (54.1%). Many of the condition's symptoms, such as shortness of breath, swollen ankles/oedema and tiredness, were recorded as reasons for encounter in patients who were newly diagnosed with heart failure. Chronic obstructive pulmonary disease and diabetes were the most common other problems that were treated with newly diagnosed heart failure. New cases of heart failure were often managed with medications immediately (150.7 per 100 problems) as well as with other forms of treatment (37.3 per 100 problems), mainly electrical tracings and advice on treatment. The range of medications used to care for new cases was similar to that for heart failure problems overall. GPs frequently ordered pathology tests to investigate new cases of heart failure (104.5 per 100 problems). The most common tests requested were electrolytes, full blood count, and liver function. Imaging tests were more widespread for new problems (29.8 per 100 problems) than for heart failure problems overall, particularly chest X-rays and echocardiography. Similarly, referrals to other health professionals or services were also more frequent for new problems (25.4 per 100).

Patients

	Per cent
Male	44.9
Female	55.2
Age	
<1–14	0.0
15–24	0.2
25–44	0.7
45–64	11.1
65–74	24.0
75+	63.9
Origin	
NESB	13.9
A&TSI	1.6

Reasons for encounter

	All	New
	n 1,512	n 129
	Rate[a]	
Heart failure	25.6	14.4
Shortness of breath	17.9	41.1
Prescription all*	17.6	8.7
Cardiac check-up*	12.8	1.4
Swelling/oedema	8.6	36.7
General check-up*	8.5	0.0
Diabetes*	3.7	0.0
Follow up encounter cv	3.4	4.0
Immunisation all*	3.3	0.0
Cough	3.2	3.1

Other problems managed

	All	New
	n 1,015	n 73
	Rate[a]	
Hypertension*	10.3	2.1
Diabetes*	9.4	10.2
COPD	6.7	17.5
Atrial fibrillation/flutter	5.3	4.8
IHD without angina	4.6	0.0
Osteoarthritis*	4.1	4.3
Immunisation all*	3.8	1.0
Asthma	3.5	2.6
Sleep disturbance	2.6	0.0
Gout	2.3	1.6

Medications

	All	New
	n 1,162	n 101
	Rate[b]	
Frusemide	47.8	54.5
Digoxin	21.2	18.4
Potassium chloride	10.1	6.4
Captopril	8.6	17.0
Enalapril mal	5.6	1.0
Isosorbide nitrate	4.2	15.4
Lisinopril	3.1	1.0
Aspirin	2.7	0.0
Perindopril	2.5	0.0
Quinapril	2.3	6.5

HEART FAILURE

N = 846

(0.6% of all problems managed)

New problems = 67

(7.9% of all heart failure problems)

Other treatments

	All	New
	n 118	n 25
	Rate[b]	
Advice medication	5.0	3.3
Advice treatment	3.4	13.3
Electrical tracings	2.0	15.2
Counselling — problem	0.7	1.0
Advice nutrition/weight	0.6	1.8
Advice/education	0.5	0.0
Urine test	0.3	0.0
Other admin	0.3	0.0
Advice alcohol	0.2	0.0
Observe/wait	0.2	0.0

Pathology

	All	New
	n 238	n 70
	Rate[b]	
EUC	10.1	28.5
Full blood count	5.0	19.7
Liver function	3.8	16.3
Coagulation	2.4	2.4
Digoxin	1.3	6.2
Glucose tolerance	1.2	7.7
Lipids	1.0	3.3
Thyroid function	0.8	5.4
Cardiac enzymes	0.5	0.3
Blood test	0.5	4.8

Imaging

	All	New
	n 60	n 20
	Rate[b]	
X-ray; chest	6.0	24.0
Echocardiography	0.6	3.8
Plain X-ray; bone(s)	0.2	1.6
US/CT/contrast	0.1	0.0
US/CT/contr; abdomen	0.1	0.9

Referrals

	All	New
	n 44	n 17
	Rate[b]	
Cardiologist	1.7	8.6
Hospital admission	1.6	8.0
ECG	1.1	4.8
Physician	0.5	3.1
Other health profess	0.1	1.1
Aged care assessmt	0.1	0.0
Occupational therap	0.1	0.0
Social worker	0.1	0.0

(a) Rate per 100 heart failure encounters.

(b) Rate per 100 heart failure problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 2: Heart failure

Atrial fibrillation or atrial flutter

Atrial fibrillation involves the atria in the heart beating rapidly, chaotically and ineffectively so that the heart may not pump blood to meet the body's demands. This can happen intermittently or persistently and usually accompanies other forms of heart disease or less often, other conditions such as thyroid disease. It affects about 0.5% of adults but depends on age, rising to 10% in those over 75 years. Atrial fibrillation can lead to the formation of emboli which could be fatal or cause manifestations such as non-fatal stroke. To prevent this happening, many people with atrial fibrillation take anticoagulant medication long term. Other medications indicated to treat atrial fibrillation and atrial flutter are digoxin, beta blockers and other antiarrhythmics. Atrial flutter is another form of rapid, irregular contraction of the atria causing ineffective pumping of the heart. It is less common than atrial fibrillation (Fauci et al. 1998).

There were 554 encounters during which GPs cared for atrial fibrillation or flutter, at a rate of 0.6 per 100 encounters, making up 0.4% of all problems. Among these, there were 34 (6.1%) new problems (0.03 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 589,000 encounters for atrial fibrillation or flutter per year and around 36,000 new cases of atrial fibrillation or flutter diagnosed in general practice each year. Figure 3 summarises the most frequent observations for all encounters at which atrial fibrillation or flutter was treated compared with those for new atrial fibrillation or flutter diagnoses.

Patients managed for this condition were predominantly male (56.7%), unlike the gender distribution in the total data set (42.3% male). The highest proportion of patients was 75 years and older (46.4%). People from non-English-speaking background represented 15.1% of patients and 1.1% were of Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of encounters for atrial fibrillation or flutter problems in the NESB or Indigenous populations compared with all patients (0.6, 0.5 and 0.6 per 100 encounters respectively).

Of the 944 patient reasons for encounter recorded, the most frequent were atrial fibrillation/flutter (19.6 per 100 atrial fibrillation/flutter encounters), requests for medication for any condition (17.1 per 100) and cardiac check-up (17.0 per 100). The rate of reasons for encounter in patients managed for atrial fibrillation or flutter (170.4 per 100 encounters) was well above average.

The most common co-existing problems managed with atrial fibrillation/flutter were hypertension (18.2 per 100 atrial fibrillation/flutter encounters), heart failure (8.1 per 100) and diabetes (4.8 per 100). The rates of hypertension and diabetes were well above average in these patients. Ischaemic heart disease without angina and lipid disorder were also among the top ten other conditions cared for with atrial fibrillation/flutter.

There was a high rate of medication for atrial fibrillation/flutter problems (95.7 per 100 problems) compared with the average. Although there were several types of medications used, anticoagulants (warfarin), digoxin and antiarrhythmic agents (sotalol, amiodarone, quinidine) were the most widespread, as would be expected. Overall, anticoagulants represented 36.3% of all medications given for atrial fibrillation/flutter, digoxin 29.8% and antiarrhythmics 13.7%. For the 72% of atrial fibrillation/flutter encounters where GPs recorded medication status, 11.3% were new medications, that is, they were used for the first time to treat atrial fibrillation/flutter in these patients. Of these new medications, digoxin was the most popular (30.3% of all new medications given for atrial fibrillation/flutter) (results not presented).

Other forms of management were much less common for atrial fibrillation/flutter (12.4 per 100 problems). They involved principally providing advice on medication (4.2 per 100), advice on treatment (1.3 per 100) and performing electrical tracings (2.6 per 100).

Pathology tests were ordered relatively frequently for these conditions (46.6 per 100 problems) compared with the average. The main test requested was coagulation (28.4 per 100), necessary to monitor the action of anticoagulant therapy in these patients, followed by digoxin assays (4.1 per 100).

Imaging was rarely used to investigate atrial fibrillation/flutter problems (1.9 per 100 problems). Referrals to other health services were about average overall (6.7 per 100 problems). Where these occurred, they were to cardiologists, for hospital admission or for electrocardiographic tracings and Holter monitoring.

As there were only 34 encounters where GPs managed new cases of this problem, results are discussed in general terms for interest but should be interpreted with caution. Unlike atrial fibrillation/flutter problems overall, new diagnoses of these conditions were mainly among females. The most common patient reasons for encounter recorded were palpitations and chest pain. Medications were given frequently to treat these new cases (97.0 per 100 problems), digoxin and warfarin being the most widely used. Electrocardiographic tracings and advice were the only other treatments GPs administered. Pathology testing was ordered at a much higher rate in new cases (111.7 per 100 problems) than in atrial fibrillation/flutter overall. These were mainly coagulation tests. Imaging was also requested more often to investigate newly diagnosed atrial fibrillation/flutter problems (17.6 per 100 problems), mainly chest
X-rays and echocardiography. Similarly, new cases were referred to other health professionals at a higher rate (41.2 per 100 problems), particularly to cardiologists and for Holter monitoring.

Patients

	Per cent
Male	56.7
Female	43.3
Age	
<1–14	0.0
15–24	0.3
25–44	2.9
45–64	19.2
65–74	31.2
75+	46.4
Origin	
NESB	15.1
A&TSI	1.1

Reasons for encounter

	All	New
	n 944	n 54
	Rate[(a)]	
Atrial fibrillation/flutter	19.6	9.9
Prescription all*	17.1	6.3
Cardiac check-up*	17.0	12.0
Blood test blood	9.0	0.0
Blood test NOS	8.1	0.8
General check-up*	8.1	3.5
Palpitations	5.5	33.9
Hypertension*	5.0	0.0
Immunisation all*	4.3	0.0
Test results*	4.2	0.0

Other problems managed

	All	New
	n 605	n 25
	Rate[(a)]	
Hypertension*	18.2	6.4
Heart failure	8.1	7.5
Diabetes*	4.8	7.7
Immunisation all*	3.9	0.0
IHD without angina	3.9	2.6
Osteoarthritis*	3.2	5.0
Lipid disorder	3.2	0.0
Sleep disturbance	2.3	0.0
Depression*	1.9	5.3
COPD	1.6	5.4

Medications

	All	New
	n 530	n 33
	Rate[(b)]	
Warfarin sodium	33.9	16.4
Digoxin	28.5	21.5
Sotalol	6.5	10.8
Verapamil hcl	3.7	3.3
Amiodarone hcl	3.7	6.5
Aspirin	3.0	9.1
Frusemide	2.5	0.0
Quinidine sulphate	2.1	0.0
Atenolol	1.2	0.0
Paracetamol	0.7	0.0

ATRIAL FIBRILLATION or FLUTTER

N = 554

(0.4% of all problems managed)

New problems = 34**

(6.1% of all atrial fibrillation or flutter problems)

Other treatments

	All	New
	n 69	n 10
	Rate[(b)]	
Advice medication	4.2	4.7
Electrical tracings	2.6	18.5
Advice treatment	1.5	0.0
Counselling — problem	1.3	0.0
Incision/drainage/aspir	0.6	0.0
Reassurance, support	0.6	0.0
Advice/education	0.5	6.6
Observe/wait	0.4	0.0
Advice health/body	0.3	0.0
Advice lifestyle	0.2	0.0

Pathology

	All	New
	n 258	n 38
	Rate[(b)]	
Coagulation	28.4	23.6
Digoxin	4.1	3.8
EUC	3.4	16.4
Thyroid function	1.8	16.5
Full blood count	1.8	16.2
Lipids	1.4	8.2
Other test NEC	0.9	0.0
Liver function	0.9	0.0
Cardiac enzymes	0.9	8.9
Blood test	0.7	0.0

Imaging

	All	New
	n 11	n 6
	Rate[(b)]	
X-ray; chest	0.8	7.8
Echocardiography	0.7	7.8
Angiography; coronary	0.2	0.0
US/CT/contr; cardiac	0.1	2.3
US/CT/contrast; chest	0.1	0.0

Referrals

	All	New
	n 37	n 14
	Rate[(b)]	
Cardiologist	3.8	19.5
ECG	1.2	5.9
Hospital admission	0.5	6.2
Holter monitor	0.5	8.5
General practitioner	0.3	0.0
Physician	0.2	0.0

(a) Rate per 100 atrial fibrillation or flutter encounters.

(b) Rate per 100 atrial fibrillation or flutter problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

** The number of encounters for new problems is low so results should be interpreted with caution as they may be unreliable.

Figure 3: Atrial fibrillation or atrial flutter

Palpitations

Palpitations describe an abnormal subjective awareness of the heart beat, which can be sporadic or continuous, and with a regular or irregular rhythm. They may be associated with heart or thyroid conditions, anxiety states, menopause or the use of certain medications but are also extremely common in healthy individuals (Fauci et al. 1998).

GPs managed palpitations on 139 occasions (rate 0.1 per 100 encounters), representing 0.1% of all problems seen. Of these, 57 (0.4%) were new palpitation problems (0.06 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 148,000 encounters for palpitations per year and around 60,000 new cases of palpitations diagnosed in general practice each year. Figure 4 summarises the most frequent observations for all encounters at which palpitations were treated compared with those for new cases of palpitations.

Most of the patients in whom palpitations problems were managed were female (69.9%). The highest proportion of patients was aged 45–64 years. Those of non-English-speaking background were 24.8% of patients, while people of Aboriginal or Torres Strait Islander origin represented 1.6%. There were no statistically significant differences between the rates of encounters for palpitations in the Indigenous population compared with all patients (0.2 vs 0.1 per 100 encounters respectively). Palpitations were managed statistically significantly more often among NESB patients (0.2 per 100 encounters—the rate difference between NESB and all patients is 0.1 [95% CI of the difference is 0.03–0.17]).

There were 266 patient reasons for encounter recorded at palpitation encounters, at a rate of 191.4 per 100 encounters, which is considerably above average. Palpitations were the most common reason recorded (74.9 per 100 palpitations encounters), followed by prescription requests for any problem (16.8 per 100), cardiac check-up (5.2 per 100) and depression (4.6 per 100). Hypothyroidism and menopausal complaints were also in the top ten.

The most frequent other problems managed with palpitations were hypertension (12.1 per 100 encounters), depression (6.3 per 100) and menopausal complaints (5.5 per 100). Hypothyroidism was also recorded among the conditions seen most often in these patients. A total of 143 other problems were treated at these encounters. The rate of total problems managed at these encounters was very high (202.9 per 100 encounters), indicating that these patients had a high comorbidity profile.

GPs gave medications to treat palpitations at a rate of 35.2 per 100 problems, which is well below the average for the study sample. Several different types of medications were among the top ten including beta blockers (atenolol, propanolol, metoprolol), antiarrhythmics (sotalol, amiodarone, quinidine), calcium channel blockers (verapamil), inotropes (digoxin) and antiplatelet agents (aspirin). Of all medications given for palpitations, beta blockers represented 37.9%, antiarrhythmics 23.8%, calcium channel blockers 14.5%, inotropes 9.6% and antiplatelet agents 4.6%.

Other treatments were used for this problem at a rate of 41.7 per 100 problems. The most common forms were electrical tracings (22.6 per 100), providing advice on treatment (7.7 per 100) and providing advice on nutrition/weight (7.0 per 100).

Pathology tests were relatively frequent for palpitations (53.2 per 100 problems) compared with the average, the main ones being assessment of thyroid function (20.3 per 100), full blood count (12.6 per 100) and liver function (5.7 per 100). Imaging was generally not used to investigate this problem.

Referrals to other health professionals or services occurred at a relatively high rate of 19.4 per 100 palpitations problems. These were made principally to cardiologists (6.8 per 100) or

for electrical recordings: electrocardiography (5.6 per 100) and Holter monitoring (4.9 per 100).

There were only 57 palpitation encounters at which new problems were managed so these results should be interpreted with caution. In general terms, the profile of new cases of palpitations and their management were similar to that of all patients who had this problem managed. However, GPs requested pathology tests at a very high rate in new cases of palpitations (107.0 per 100 problems) compared to the overall study average, most often for thyroid function, full blood count and liver function. Patients were referred at a rate of 26.3 per 100 problems, mainly for electrocardiography and Holter monitoring.

Patients

	Per cent
Male	30.1
Female	69.9
Age	
<1–14	0.5
15–24	2.8
25–44	20.9
45–64	44.6
65–74	18.8
75+	12.3
Origin	
NESB	24.8
A&TSI	1.6

Reasons for encounter

	All	New
	n 266	n 110
	Rate[(a)]	
Palpitations	74.9	86.9
Prescription all*	16.8	20.8
Cardiac check-up*	5.2	3.2
Depression*	4.6	7.7
Hypertension*	4.5	3.9
Vertigo/dizziness	3.9	4.0
Hypothyroidism/myxoed	3.0	0.0
Diarrhoea	2.8	0.0
Menopausal complaint	2.8	2.2
Discuss patient rfe	2.6	0.0

Other problems managed

	All	New
	n 143	n 52
	Rate[(a)]	
Hypertension*	12.1	16.9
Depression*	6.3	7.7
Menopausal complaint	5.5	5.7
UTI*	4.0	3.3
Vit/nutrition deficiency	3.9	7.3
Hypothyroidism/myxoed	3.8	1.9
Osteoarthritis*	3.7	4.8
Dementia (incl senile)	2.5	0.0
Back complaint*	2.1	0.7
Female genital check*	2.0	3.2

Medications

	All	New
	n 49	n 6
	Rate[(b)]	
Atenolol	6.0	2.0
Propranolol	5.3	0.0
Sotalol	5.2	0.0
Verapamil	5.1	1.4
Digoxin	3.4	4.7
Amiodarone hcl	1.7	0.0
Metoprolol	1.7	0.6
Aspirin	1.6	0.0
Iron tablets	1.1	0.0
Quinidine sulphate	1.0	0.0

PALPITATIONS

N = 139

(0.1% of all problems managed)

New problems = 57**

(0.4% of all palpitations problems)

Other treatments

	All	New
	n 58	n 31
	Rate[(b)]	
Electrical tracings	22.6	18.3
Advice treatment	7.7	12.8
Advice nutrition/weight	7.0	6.5
Counselling — problem	4.4	3.4
Advice medication	4.3	2.1
Reassurance, support	3.3	0.0
Advice smoking	2.5	4.4
Observe/wait	2.2	2.6
Advice health/body	1.3	0.0
Advice/education	1.1	2.0

Pathology

	All	New
	n 74	n 61
	Rate[(b)]	
Thyroid function	20.3	36.8
Full blood count	12.6	27.4
Liver function	5.7	13.9
Lipids	3.6	8.8
EUC	3.6	5.9
Multibiochemical tests	1.5	3.7
Ferritin	1.4	2.0
Infertility/pregnancy	1.1	0.0
Cardiac enzymes	0.8	1.2
Hormone assay	0.8	1.9

Imaging

	All	New
	n 2	n 0
	Rate[(b)]	
US/CT/contrast; head	0.3	0.0
Echocardiography	0.3	0.0

Referrals

	All	New
	n 27	n 15
	Rate[(b)]	
Cardiologist	6.8	3.6
ECG	5.6	10.3
Holter monitor	4.9	7.7
Hospital admission	0.9	2.2
Endocrinologist	0.6	1.6
Specialist	0.6	0.0
Doppler test	0.3	0.7

(a) Rate per 100 palpitations encounters.

(b) Rate per 100 palpitations problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

** The number of encounters for new problems is low so results should be interpreted with caution as they may be unreliable.

Figure 4: Palpitations

Cerebrovascular disease

Stroke

Stroke is the most important manifestation of cerebrovascular disease. A stroke occurs when an artery supplying blood to a part of the brain suddenly becomes blocked (ischaemic stroke) or bleeds (haemorrhagic stroke). This causes loss of function of part of the brain and impairment in any or all of a range of functions including movement of body parts, vision, planning, communication and swallowing. Major modifiable causal risk factors for stroke include hypertension, cigarette smoking, diabetes, atrial fibrillation and other cardiac disease, and narrowing of the carotid arteries. Each year, there are about 40,000 stroke events among Australians, and the number of people who have had a stroke at some time in their lives is estimated at 120,000–220,000. About 12,000 of these patients suffer another stroke each year. The condition causes 25% of all chronic disability and is Australia's second biggest single killer, accounting for around 10% of all deaths. To maximise functional outcome and minimise handicap, many patients need rehabilitation after a stroke (AIHW 2001, DHAC & AIHW 1999, Hankey 2000).

Imaging investigations to diagnose the cause of a suspected stroke include plain computerised tomographic brain scan and, in selected patients, duplex ultrasound imaging of the carotid arteries and echocardiography. Laboratory tests indicated in most patients include blood glucose, full blood count, erythrocyte sedimentation rate, blood biochemistry, lipids, electrocardiography and urine analysis. Effective strategies in the secondary prevention of stroke include reduction of blood pressure, antiplatelet and anticoagulant therapies, carotid endarterectomy, cessation of smoking and lowering of blood cholesterol. Long-term anticoagulation is indicated in patients with ischaemic stroke due to embolism from the heart, such as those with atrial fibrillation, recent myocardial infarction or a diseased heart valve. The GP's role in the secondary prevention of strokes is to follow up patients regularly, ensure optimal control of the disease that caused the stroke, encourage patient adherence to medication, and assess and manage any new symptoms, reserving referral to a neurologist if difficulties arise (Hankey 2000).

GPs managed stroke on 170 occasions, at a rate of 0.2 per 100 encounters, amounting to 0.1% of all problems seen. Of these, 29 (17.0%) were new problems (0.03 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 181,000 encounters for stroke per year and around 31,000 new cases of stroke diagnosed in general practice each year. Figure 5 summarises the most frequent observations for all encounters at which stroke was treated compared with those for new stroke diagnoses.

Patients who had stroke problems managed were predominantly male (59.0%), in contrast with the proportion of male patients in the total data set (42.3%). The largest proportion of patients was in the 75 years and over age range (48.2%). People from non-English-speaking background made up 7.8% of patients, while those of Aboriginal or Torres Strait Islander origin represented 1.1%. There were no statistically significant differences between the rates of encounters for stroke problems in the Indigenous population compared with all patients (0.2 vs 0.2 per 100 encounters respectively). But stroke encounters were statistically significantly less common among NESB patients (0.1 per 100 encounters—the rate difference between NESB and all patients is 0.1 [95% CI of the difference is 0.01–0.15]).

Of the 288 patient reasons for encounter recorded, stroke was the most frequent (32.4 per 100 stroke encounters), followed by requests for medication for any condition (9.2 per 100) and general check-up (7.5 per 100). The rate of 169.4 reasons for encounter per 100 encounters was above the average.

The most common comorbidities cared for with stroke were hypertension (10.5 per 100 stroke encounters) and dementia (6.3 per 100). Also among the top ten conditions managed with stroke were diabetes, depression, atrial fibrillation or flutter and heart failure.

GPs gave medications to treat stroke at a rate of 43.5 per 100 problems, which is well below the average. These included a wide range of medications reflecting the variety of sequelae and problems associated with this disease. Antiplatelet medications (aspirin) and anticoagulants (warfarin and enoxaparin) were the types used most widely, accounting for 23.5% and 23.1% of all medications used for stroke respectively.

Other forms of treatment were used at a lower rate (18.2 per 100 problems) and mainly involved giving advice on treatment (2.9 per 100) and rehabilitation services (1.9 per 100).

Pathology tests were requested in stroke cases at a rate of 11.2 per 100 problems, which is below the average. Coagulation tests, probably to monitor the effect of anticoagulant medications and guide dose adjustment, were at the top of the list (5.6 per 100).

Overall, imaging for stroke problems was uncommon (4.1 per 100 problems). The tests ordered most often were ultrasound/computerised tomographic scan/contrast imaging of the brain or head.

GPs frequently referred stroke patients to other health professionals and services (20.0 per 100 problems). These covered hospital admission, physiotherapy, neurologists, urologists, cardiologists, speech therapists, home support services, nursing homes and aged care assessment, reflecting the wide-ranging needs of people who have had a stroke.

Half the new cases of stroke were in those aged 75 years and over, and the majority of patients were female (54.5%). The reasons for encounter most often recorded included stroke and stroke symptoms such as paralysis/weakness, headache and speech disorder. Medications were given at a rate of 24.1 per 100 problems in new stroke cases and were mainly anticoagulants, antiplatelet agents (aspirin) and morphine. Although pathology and imaging tests, especially ultrasound/computerised tomographic scan/contrast imaging of the brain or head, were used to investigate some of these cases, GPs most often referred them to others, particularly for hospital admission and to Emergency Services.

Patients

	Per cent
Male	59.0
Female	41.0
Age	
<1–14	0.4
15–24	1.6
25–44	3.0
45–64	24.2
65–74	22.7
75+	48.2
Origin	
NESB	7.8
A&TSI	1.1

Reasons for encounter

	All	New
	n 288	n 54
	Rate[(a)]	
Stroke	32.4	35.0
Prescription all*	9.2	0.0
General check-up*	7.5	5.7
Headache	5.2	11.7
Cardiac check-up*	5.1	6.5
Abnormal test results*	4.8	5.6
Admin procedure NOS	4.5	0.0
Paralysis/weakness	3.4	14.6
Discuss patient rfe	3.2	0.0
Hypertension*	3.1	1.2

Other problems managed

	All	New
	n 184	n 27
	Rate[(a)]	
Hypertension*	10.5	2.6
Dementia (incl senile)	6.3	6.7
Abnormal test results*	5.7	11.1
Diabetes*	5.4	2.1
Depression*	4.2	0.0
Respiratory disease	2.9	5.6
Immunisation all*	2.8	0.0
Atrial fibrillation/flutter	2.7	3.7
Heart failure	2.3	4.2
UTI*	2.2	0.0

Medications

	All	New
	n 74	n 7
	Rate[(b)]	
Aspirin	10.3	6.5
Warfarin sodium	9.1	7.0
Morphine w/wo aspirin	2.3	6.7
Levodopa + Carbidopa	1.7	0.0
Paracetamol	1.4	0.0
Temazepam	1.3	0.0
Influenza virus vaccine	1.1	0.0
Frusemide	1.1	0.0
Enoxaparin	1.0	0.0
Phenytoin	0.8	0.0

STROKE

N = 170

(0.1% of all problems managed)

New problems = 29**

(17.0% of all stroke problems)

Other treatments

	All	New
	n 31	n 4
	Rate[(b)]	
Advice treatment	2.9	8.4
Rehabilitation	1.9	0.0
Sickness certificate	1.8	0.0
Other admin	1.5	0.0
Advice relationship	1.4	0.0
Observe/wait	1.4	4.9
Counselling — problem	1.2	1.3
Local injection	1.0	0.0
Advice health/body	0.9	0.0
Advice exercise	0.8	0.0

Pathology

	All	New
	n 19	n 9
	Rate[(b)]	
Coagulation	5.6	5.7
Full blood count	2.2	8.0
Multibiochemical tests	1.4	8.0
Thyroid function	1.4	8.0
EUC	0.9	0.0

Imaging

	All	New
	n 8	n 5
	Rate[(b)]	
US/CT/contrast; brain	1.6	9.5
US/CT/contrast; head	1.2	3.6
Test; Doppler	0.6	3.6
Scan; bone(s)	0.6	0.0
US/CT/contrast	0.4	0.0

Referrals

	All	New
	n 34	n 10
	Rate[(b)]	
Hospital admission	6.1	12.2
Physiotherapy	5.4	5.6
Neurologist	1.9	3.1
Doppler test	1.2	1.3
Emergency (Hospital)	0.9	5.0
Physician	0.9	0.0
Home support service	0.8	0.0
Urologist	0.8	4.4
Nursing home	0.5	0.0
Cardiologist	0.4	0.0

(a) Rate per 100 stroke encounters.

(b) Rate per 100 stroke problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

** The number of encounters for new problems is low so results should be interpreted with caution as they may be unreliable.

Figure 5: Stroke

Transient cerebral ischaemia

A transient ischaemic attack (TIA) occurs when an artery supplying blood to the eye or a part of the brain suddenly becomes blocked and has the same causes and symptoms as an ischaemic stroke. The only difference is the duration of symptoms: if they resolve completely within 24 hours, the episode is called TIA, if they persist for longer, it is called a stroke. Every year, about 10,000 Australians have a TIA. There are an estimated 30,000 Australians who have had a previous TIA. Recommended investigations to diagnose a suspected TIA and management practices for its treatment are the same as those indicated for stroke (refer to section on Stroke). Effective strategies in the prevention of transient ischaemic attacks include reduction of blood pressure, antiplatelet and anticoagulant therapies, carotid endarterectomy, cessation of smoking and lowering of cholesterol (DHAC & AIHW 1999, Hankey 2000).

TIA was managed on 156 occasions, at a rate of 0.2 per 100 encounters, representing 0.1% of all problems. There were 55 new TIA problems (0.1 per 100 encounters), accounting for 35.2% of all TIAs. Based on 103 million Medicare-claimed general practice consultations, this equates to about 166,000 encounters for TIA per year and around 58,000 new cases of TIA diagnosed in general practice each year. Figure 6 summarises the most frequent observations for all encounters at which TIA was treated compared with those for new TIA diagnoses.

Patients who had TIA managed were more likely to be male (61.6%) than those in the total data set (42.3%). Those aged 75 years and over made up the largest proportion of patients (50.0%). People from a non-English-speaking background accounted for 8.2% of patients and there were no cases among Aboriginals or Torres Strait Islanders. There were no statistically significant differences between the rates of TIA encounters in the NESB population compared with all patients (0.1 vs 0.2 per 100 encounters respectively).

Among the top patient reasons for encounter were TIA (19.9 per 100 TIA encounters) as well as various typical TIA symptoms such as vertigo/dizziness (23.2 per 100), fainting/syncope (5.6 per 100), visual disturbance (2.7 per 100) and paralysis/weakness (2.5 per 100).

Frequent conditions co-managed with TIA were hypertension (20.3 per 100 TIA encounters, which was more than double the average rate), lipid disorder (5.4 per 100) and diabetes (3.5 per 100). Chronic obstructive pulmonary disease, asthma and heart failure also featured in the top other diseases cared for with TIA.

Medications were given for TIA well below average, at a rate of 50.6 per 100 problems. Antiplatelet agents (aspirin, ticlopidine) were the group used most widely, aspirin being the most popular medication (61.2% of all medications), followed by anticoagulants (warfarin) which accounted for 24.4% of all TIA pharmaceuticals.

GPs used other forms of treatment to a lower degree in treating TIA problems (22.4 per 100 problems). The main ones involved providing advice on treatment (6.2 per 100), counselling (2.9 per 100) and giving advice on medication (2.1 per 100) but an observe/wait strategy was also adopted sometimes (3.5 per 100).

Pathology tests were relatively common in the investigation or monitoring of TIA (46.1 per 100 problems) compared with the average for the whole study sample. Of these, coagulation tests were requested most often (13.4 per 100), followed by full blood count (7.6 per 100), lipids (6.9 per 100) and glucose tolerance tests (4.9 per 100).

Imaging was ordered for TIA problems at a high rate (21.8 per 100 problems) compared with the average, the most common being ultrasound/computerised tomographic scan/contrast imaging of the brain, heart, blood vessels and head.

Referrals occurred at a rate of 10.2 per 100 problems and spanned a range of tests, services and specialists.

As there were only 55 TIA encounters where GPs managed new problems, these results are discussed briefly and should be interpreted with caution. Generally, new cases were identified among patients with the same characteristics as all those who had TIA managed. Not surprisingly, hypertension was the most common other condition managed in people with new TIA problems. Lipid disorder and diabetes were also in the top ten other problems handled with newly diagnosed TIA. GPs managed these cases similarly to the way they treated all TIA problems. However, pathology testing was used more frequently to investigate new cases (63.6 per 100 problems) than for TIA problems overall. This focused mainly on full blood count, glucose tolerance and lipids tests. Requests for imaging were also higher for new cases (40.0 per 100 problems) and covered both Doppler and ultrasound/computerised tomographic scan/contrast imaging. The rate of referrals was higher in these new cases of TIA as well (20.0 per 100 problems) and were made most often for Doppler tests and electrocardiographic tracings.

Patients

	Per cent
Male	61.6
Female	38.4
Age	
<1–14	0.7
15–24	0.0
25–44	4.4
45–64	18.6
65–74	26.4
75+	50.0
Origin	
NESB	8.2
A&TSI	0.0

Reasons for encounter

	All	New
	n 267	n 95
	Rate[(a)]	
Vertigo/dizziness	23.2	29.5
TIA	19.9	27.5
Prescription all*	11.3	6.4
Cardiac check-up*	8.6	6.1
General check-up*	6.6	4.6
Blood test NOS	6.3	0.0
Fainting/syncope	5.6	9.8
Hypertension*	5.5	5.8
Test results*	3.7	0.0
Visual disturbance	2.7	6.3

Other problems managed

	All	New
	n 159	n 49
	Rate[(a)]	
Hypertension*	20.3	17.6
Lipid disorder	5.4	6.7
Diabetes*	3.5	4.0
COPD	2.6	4.6
Prescription all*	2.5	3.4
Asthma	2.4	0.0
Heart failure	2.4	3.7
Sleep disturbance	2.3	2.1
Immunisation all*	2.2	1.9
Depression*	2.1	1.7

Medications

	All	New
	n 79	n 28
	Rate[(b)]	
Aspirin	30.6	38.2
Warfarin sodium	12.4	5.2
Ticlopidine	1.8	1.8
Paracetamol	1.3	1.7
Prochlorperazine	1.0	1.4
Betahistine	0.8	0.0
Diltiazem anti-angina	0.7	2.0
Thiazide + Amiloride	0.6	0.0
Aspirin+Parac.+Caff.	0.4	0.0
Pravastatin	0.3	0.0

TRANSIENT ISCHAEMIC ATTACK

N = 156

(0.1% of all problems managed)

New problems = 55**

(35.2% of all transient ischaemic attack problems)

Other treatments

	All	New
	n 35	n 8
	Rate[(b)]	
Advice treatment	6.2	4.8
Observe/wait	3.5	0.0
Counselling — problem	2.9	3.0
Advice medication	2.4	1.9
Advice/education	2.1	0.0
Electrical tracings	1.8	1.1
Reassurance, support	1.5	1.9
Advice health/body	0.9	0.8
Rehabilitation	0.6	0.0
Advice nutrition/weight	0.4	0.0

Pathology

	All	New
	n 72	n 35
	Rate[(b)]	
Coagulation	13.4	1.5
Full blood count	7.6	15.9
Lipids	6.9	10.7
Glucose tolerance	4.9	12.8
Liver function	2.4	6.7
EUC	1.9	5.3
Digoxin	1.7	0.9
ESR	1.6	4.6
Urine MC&S	1.6	2.6
Calcium/phosphate	1.3	0.0

Imaging

	All	New
	n 34	n 22
	Rate[(b)]	
US/CT/contrast; brain	3.2	3.9
US/CT/contrast	2.9	4.5
US/CT/contr; cardiac	2.9	3.8
Doppler	2.5	5.8
US/CT/contr; heart	2.1	2.4
US/CT/contr; vascular	2.0	3.9
US/CT/contrast; head	1.6	2.2
Echocardiography	1.1	3.3
X-ray; spinal	0.7	1.9
X-ray; hip	0.6	1.7

Referrals

	All	New
	n 16	n 11
	Rate[(b)]	
Doppler test	3.1	8.1
Neurologist	2.7	2.2
ECG	2.0	5.7
Hospital admission	1.1	3.2
Rehabilitation	0.7	0.0
Cardiologist	0.6	1.6

(a) Rate per 100 transient ischaemic attack encounters.

(b) Rate per 100 transient ischaemic attack problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

** The number of encounters for new problems is low so results should be interpreted with caution as they may be unreliable.

Figure 6: Transient ischaemic attack

Diabetes mellitus

Diabetes is a chronic disease, characterised by hyperglycaemia (high blood glucose levels) caused by a deficiency of insulin, the hormone that metabolises glucose, and/or resistance to its action. Long-term complications of the disease include heart disease and stroke; foot ulceration, gangrene and lower limb amputation; kidney disease leading to kidney failure; and visual impairment which can result in blindness. Diabetes is the most common cause of blindness in those aged under 60 years, the second most common reason to start renal dialysis, and the most common cause of non-traumatic amputation. Pregnancy-related complications can also result from the condition. Tight control of glucose, lipids and blood pressure levels can prevent the development of diabetes complications. GPs play a crucial role in the prevention and care of diabetes since they are optimally placed to screen people at risk, provide follow-up care and advice to those with diabetes or at high risk, and refer patients to other health service providers. The aims of management are to identify and address patient concerns, relieve acute symptoms, optimise control of glycaemia and other risk factors for complications, and to treat complications (DHAC & AIHW 1999b).

Type 1 diabetes

Type 1 diabetes is a disease in which the body's immune system destroys the insulin-producing beta cells in the pancreas, leading to a complete deficiency of insulin and consequent hyperglycaemia. Type 1 diabetes accounts for around 15% of all people with diabetes. It is one of the most common chronic conditions of childhood but can occur at any age. The onset of symptoms is usually quite sudden and tends to occur before age 40. People with type 1 diabetes need to inject themselves with insulin to survive. An estimated 43,000 persons in Australia had type 1 diabetes in 1995 (DHAC & AIHW 1999b).

Screening for early detection of type 1 diabetes is not recommended because symptoms appear soon after the onset of hyperglycaemia. When required, diagnosis is based on the oral glucose tolerance test (OGTT). Laboratory investigations usually undertaken include tests for glycated haemoglobin (HbA1c), kidney function (urea, creatinine, protein) and lipids. Current guidelines recommend that patients with type 1 diabetes be initially managed by a specialist physician. Referrals to an ophthalmologist and allied health professionals (dietician, diabetes nurse and podiatrist) are also required (RACGP & Diabetes Australia 1998).

GPs managed type 1 diabetes on only 209 occasions (at a rate of 0.2 per 100 encounters), representing 0.1% of all problems. This would suggest that a significant proportion of people with type 1 diabetes is cared for by specialists (endocrinologists, paediatricians and diabetes clinics) rather than in general practice. There were only 4 (1.9%) new cases seen (0.004 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 222,000 encounters for type 1 diabetes per year. Because the number of new cases of type 1 diabetes in the study sample is so low, generalisations from these cases to the whole of general practice would not be reliable. Figure 7 summarises the most frequent observations for all encounters at which type 1 diabetes was treated compared with those for new type 1 diabetes diagnoses.

Male and female patients managed for type 1 diabetes were in equal proportion, unlike the gender distribution of the total population attending general practice (57.7% females). The

largest group of them (37.9%) was aged 45–64. Of all patients, 12.3% were from non-English-speaking background and 2.2% were from Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of encounters for type 1 diabetes in the NESB or Indigenous populations compared with all patients (0.2, 0.4 and 0.2 per 100 encounters respectively).

There were 401 reasons for encounter recorded, diabetes being the most common (47.2 per 100 encounters). The rate of 191.8 reasons for encounter per 100 encounters in these patients was well above average. Other frequent reasons were prescription requests (16.7 per 100), general check-up (8.8 per 100) and hypertension (7.0 per 100).

GPs treated 294 other problems at type 1 diabetes encounters. Hypertension was the most frequent of these (15.1 per 100 encounters), followed by depression (6.6 per 100) and ischaemic heart disease without angina (6.1 per 100). Urinary disease and heart failure were also among the top ten co-existing conditions. All of these comorbidities were managed with diabetes much more frequently than average, indicating an association between the conditions.

Medications were given at a rate of 78.5 per 100 problems and most of these were insulins (85.5%). While conventional insulins were used in the majority of cases (82.8%), the newer fast-acting analogue form, insulin lispro, ranked fourth among the medications prescribed, at a rate of 2.1 per 100 problems. Oral hypoglycaemic medications (metformin, gliclazide, acarbose, glibenclamide) were also administered but at a much lower rate.

Other forms of treatment were used at a rate of 29.7 per 100 problems and consisted mainly of advice on medication (6.7 per 100), advice on nutrition/weight (5.7 per 100), advice on treatment (3.9 per 100) and glucose tests performed in the GP's rooms (3.6 per 100).

GPs ordered pathology tests for type 1 diabetes problems relatively often (37.3 per 100 problems) compared with the average (17.0 per 100). Tests for glycohaemoglobin (HbA1c), which monitor glucose control, were the most widely requested (11.9 per 100), followed by glucose tolerance (7.2 per 100), electrolytes/urea/creatinine (4.2 per 100) and lipids tests (3.8 per 100). Imaging was not used in these patients.

Overall, there was an average rate of referrals for type 1 diabetes problems (7.2 per 100 problems) and they were mainly to endocrinologists and ophthalmologists and for hospital admission.

As the number of new cases of type 1 diabetes in the study sample is so low (only four new problems), the observations on the management of these particular cases may not reflect usual practice and are therefore not discussed further.

Patients

	Per cent
Male	50.0
Female	50.0
Age	
<1–14	1.4
15–24	6.4
25–44	16.3
45–64	37.9
65–74	13.7
75+	24.3
Origin	
NESB	12.3
A&TSI	2.2

Reasons for encounter

	All	New
	n 401	n 7
	Rate[a]	
Diabetes*	47.2	56.1
Prescription all*	16.7	9.6
General check-up*	8.8	34.3
Hypertension*	7.0	0.0
Cardiac check-up*	5.6	0.0
Endocrine check-up*	5.3	0.0
Cough	3.7	0.0
Back complaint*	3.3	0.0
Feeling ill	3.1	31.4
Chronic ulcer skin	2.8	0.0

Other problems managed

	All	New
	n 294	n 3
	Rate[a]	
Hypertension*	15.1	9.6
Depression*	6.6	0.0
IHD without angina	6.1	0.0
Urinary disease, other	4.4	0.0
Heart failure	4.4	0.0
Osteoarthritis*	3.7	0.0
General check-up*	3.5	34.3
Chronic ulcer skin	3.3	0.0
Lipid disorder	3.2	0.0
Hypothyroidism/myxoed	3.0	0.0

Medications

	All	New
	n 164	n 3
	Rate[b]	
Insulin isophane	33.8	24.7
Insulin	30.5	0.0
Metformin	3.3	31.4
Insulin lispro	2.1	0.0
Gliclazide	1.7	0.0
Acarbose	1.0	0.0
Influenza virus vaccine	1.0	0.0
Phenazopyridine	0.9	0.0
Enalapril mal	0.8	0.0
Insulin zinc susp	0.8	0.0

TYPE 1 DIABETES

N = 209

(0.1% of all problems managed)

New problems = 4**

(1.9% of all type 1 diabetes problems)

Other treatments

	All	New
	n 62	n 3
	Rate[b]	
Advice medication	6.7	56.1
Advice nutrition/weight	5.7	0.0
Advice treatment	3.9	0.0
Test; glucose	3.6	0.0
Counselling — problem	2.9	0.0
Advice/education	2.8	0.0
Advice exercise	1.4	0.0
Observe/wait	0.7	0.0
Advice smoking	0.5	0.0
Urine test	0.4	0.0

Pathology

	All	New
	n 78	n 0
	Rate[b]	
HbA1c	11.9	0.0
Glucose tolerance	7.2	0.0
EUC	4.2	0.0
Lipids	3.8	0.0
Liver function	3.6	0.0
Full blood count	1.9	0.0
Urine test	0.9	0.0
Other test NEC	0.8	0.0
Histology; skin	0.6	0.0
Multibiochemical tests	0.5	0.0

Imaging

All	New
n 0	n 0

Referrals

	All	New
	n 15	n 3
	Rate[b]	
Endocrinologist	3.8	31.4
Hospital admission	1.4	31.4
Ophthalmologist	1.2	0.0
Paediatrician	0.5	0.0
Diabetes clinic	0.4	0.0

(a) Rate per 100 type 1 diabetes encounters.

(b) Rate per 100 type 1 diabetes problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

** The number of encounters for new problems is low so results should be interpreted with caution as they may be unreliable.

Figure 7: Type 1 diabetes

Type 2 diabetes

Type 2 diabetes is characterised by high blood glucose levels and resistance to the action of insulin rather than absolute insulin deficiency. Type 2 diabetes is the most common form of the disease, accounting for 85% of all diabetes in Australia. It affects about 6% of Australians aged 25 or older, with half of these people being undiagnosed and largely asymptomatic. However, among Indigenous people diabetes prevalence rates range from 10 to 30%. Diabetes is also much more common among people from certain non-English-speaking backgrounds. It occurs mainly from middle age onwards, but in high-risk groups such as Indigenous Australians, it can manifest much earlier. People with type 2 diabetes do not necessarily require insulin and many can manage successfully with dietary and lifestyle modification alone or combined with oral hypoglycaemic medication, especially initially after diagnosis. Lipid disorders, hypertension and overweight are common in those with type 2 diabetes and, if not controlled, they increase the risk of complications (NHMRC 2000, DHAC & AIHW 1999b).

Diagnosis is based on the oral glucose tolerance test (OGTT). Laboratory investigations usually undertaken include tests for glycated haemoglobin (HbA1c), kidney function (electrolytes, urea, creatinine, protein) and lipids. Healthy diet, ideal body weight and regular exercise are the most important objectives in patients with type 2 diabetes. If a trial diet for 8–12 weeks does not control blood glucose, oral hypoglycaemic medications can be used. Insulin may be needed if adequate control does not occur at maximum doses of oral hypoglycaemics. In a team approach, the GP has the central role in coordinating management of the patient and in education and counselling. Regular monitoring and follow-up of these patients by the GP is essential. Current guidelines recommend that patients with type 2 diabetes be referred to an endocrinologist when the disease is difficult to control or there are significant complications; and to an ophthalmologist at diagnosis and then at least 2 yearly. Referrals to allied health professionals (dietician, diabetes nurse and podiatrist) are also required (RACGP & Diabetes Australia 1998).

Type 2 diabetes problems were managed at 2,264 encounters (at a rate of 2.3 per 100 encounters), accounting for 1.6% of all problems recorded. Of these, 129 (5.7%) were new problems (0.1 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 2.4 million encounters for type 2 diabetes per year and around 137,000 new cases of type 2 diabetes diagnosed in general practice each year. Figure 8 summarises the most frequent observations for all encounters at which type 2 diabetes was treated compared with those for new type 2 diabetes diagnoses.

Slightly more males (52.7%) than females were managed for type 2 diabetes, in contrast with the total data set (42.3% males). The highest proportion of patients (38.7%) was in the 45–64 age bracket. People of non-English-speaking background represented 27.5% of patients, while 2.3% were people of Aboriginal or Torres Strait Islander origin. Encounters for type 2 diabetes problems occurred at a statistically significantly higher rate both in NESB and in Indigenous patients than in all patients (4.3, 4.5 and 2.3 per 100 encounters respectively). The rate difference between NESB and all patients is 2.0 (95% CI of the difference is 1.7–2.2), and between Indigenous and all patients the rate difference is 2.1 (95% CI of the difference is 1.3–3.0).

Of the 4,170 patient reasons for encounter recorded, the main one was diabetes (38.8 per 100 encounters). Other common reasons were requests for an endocrine check-up (15.1 per 100), prescription requests (15.1 per 100), cardiac check-up (11.7 per 100) and hypertension (7.7 per 100). The rate of 184.2 reasons for encounter per 100 encounters in these patients was above average.

There were 2,829 co-existing problems managed during type 2 diabetes encounters. The rate of total problems managed at these encounters (224.9 per 100 encounters) was very high and indicates that these patients had a high level of comorbidities compared with the total study sample. Hypertension was treated often in these patients (25.6 per 100 type 2 diabetes encounters). Also among the top ten were lipid disorders (8.4 per 100), ischaemic heart disease without angina (3.9 per 100) and heart failure (3.1 per 100). All of these comorbidities were much more frequently managed in patients managed for type 2 diabetes than in the total study sample, showing an association between these conditions and diabetes.

GPs used medications to manage type 2 diabetes at a rate of 75.6 per 100 problems. The main type prescribed was oral hypoglycaemics (metformin, gliclazide, glipizide, acarbose), accounting for 68.3% of all medications given for this condition. Sulfonylureas (glibenclamide, tolbutamide) and insulins were prescribed to a much lower degree: 13.1% and 9.3% of all medications used to treat type 2 diabetes respectively.

Other forms of management of type 2 diabetes were used at a rate of 41.2 per 100 problems. The most common of these were advice on nutrition/weight (15.0 per 100), glucose tests done in the GP's surgery (8.7 per 100) and advice on treatment (4.0 per 100).

Pathology tests were frequent in the management of type 2 diabetes, at a rate of 48.5 per 100 problems, compared with the average (17.0 per 100). As with type 1 diabetes, GPs requested tests for glycohaemoglobin (HbA1c) (13.5 per 100), glucose tolerance (12.7 per 100), lipids (6.6 per 100) and electrolytes/urea/creatinine (3.8 per 100). Imaging for type 2 diabetes problems was very rare.

Referrals to other health professionals and services were made at an average rate (7.6 per 100 type 2 diabetes problems). These included a wide range of specialties (ophthalmologists, dieticians, endocrinologists, podiatrists, diabetes clinics and diabetes education), reflecting the variety of complications associated with this disease.

New cases of type 2 diabetes were predominantly male (62.7%). The highest proportion of patients (46.4%) was first diagnosed at age 45–64. The main reasons for encounter recorded were diabetes, obtaining or following up test results, endocrine check-up and symptoms such as urinary frequency and excessive thirst. Hypertension (6.7 per 100 encounters for new type 2 diabetes problems) and lipid disorder (6.3 per 100) were the most frequent other conditions managed with newly diagnosed type 2 diabetes. Medications were given less often (44.9 per 100 problems) and other forms of treatment, principally advice on nutrition/weight, exercise and treatment, used more commonly (58.9 per 100) for new cases than for type 2 diabetes cases overall. As would be expected, GPs mostly prescribed oral hypoglycaemics (75.6% of all medications) for these patients, followed by sulfonylureas (13.2%) but no insulins were given. There was a higher rate of use of pathology testing (86.0 per 100 problems) among new cases, particularly glucose tolerance tests (26.8 per 100), probably to confirm a diagnosis of type 2 diabetes. The range of other tests ordered was similar to that for all type 2 diabetes cases. In contrast to type 2 diabetes patients overall, GPs often referred newly diagnosed cases to other health professionals (27.9 per 100 problems), mainly dieticians, ophthalmologists, diabetes clinics or for diabetes education and hospital admission.

Patients

	Per cent
Male	52.7
Female	47.3
Age	
<1–14	0.6
15–24	0.9
25–44	7.9
45–64	38.7
65–74	30.5
75+	21.3
Origin	
NESB	27.5
A&TSI	2.3

Reasons for encounter

	All	New
	n 4,170	n 197
	Rate[(a)]	
Diabetes*	38.8	27.0
Endocrine check-up*	15.1	6.5
Prescription all*	15.1	2.9
Cardiac check-up*	11.7	4.8
Hypertension*	7.7	1.9
General check-up*	6.3	<0.7
Test results*	5.6	19.0
Blood test endocr/metab	5.2	3.2
Immunisation all*	4.9	1.0
Lipid disorder	2.2	1.2

Other problems managed

	All	New
	n 2,829	n 92
	Rate[(a)]	
Hypertension*	25.6	6.7
Lipid disorder	8.4	6.3
Immunisation all*	5.9	1.0
IHD without angina	3.9	2.9
Heart failure	3.1	1.7
Osteoarthritis*	2.9	2.0
Depression*	2.6	<0.5
Asthma	2.2	<0.5
Acute bronchitis	1.8	1.9
Cardiac check-up*	1.7	1.4

Medications

	All	New
	n 1,712	n 58
	Rate[(b)]	
Metformin	28.7	19.8
Gliclazide	18.4	10.1
Glibenclamide	8.7	6.0
Insulin isophane	3.3	0.0
Insulin	3.3	0.0
Glipizide	3.1	2.7
Glucose Indicate	2.5	1.8
Acarbose	1.5	1.6
Tolbutamide	1.2	0.0
Aspirin	0.4	0.0

TYPE 2 DIABETES

N = 2,264

(1.6% of all problems managed)

New problems = 129

(5.7% of all type 2 diabetes problems)

Other treatments

	All	New
	n 933	n 76
	Rate[(b)]	
Advice nutrition/weight	15.0	21.9
Test; glucose	8.7	4.4
Advice treatment	4.0	5.8
Counselling — problem	3.2	5.8
Advice exercise	3.2	6.0
Advice medication	2.8	2.6
Advice/education	1.9	6.3
Observe/wait	0.6	1.5
Advice alcohol	0.4	0.0
Advice health/body	0.3	1.4

Pathology

	All	New
	n 1,098	n 111
	Rate[(b)]	
HbA1c	13.5	12.5
Glucose tolerance	12.7	26.8
Lipids	6.6	7.5
EUC	3.8	8.3
Full blood count	3.1	9.4
Liver function	2.9	6.4
Other test NEC	1.7	4.6
Multibiochemical tests	0.7	0.0
Blood test	0.5	0.4
Urine MC&S	0.4	2.7

Imaging

	All	New
	n 3	n 1
	Rate[(b)]	
X-ray; chest	0.1	0.0
US/CT/contr; abdomen	0.1	0.6

Referrals

	All	New
	n 172	N 36
	Rate[(b)]	
Ophthalmologist	1.9	5.0
Dietician/nutrition	1.2	5.1
Diabetes education	0.9	4.0
Endocrinologist	0.8	1.2
Diabetes clinic	0.8	3.5
Hospital admission	0.5	4.5
Physician	0.4	3.1
Podiatrist/chiropodist	0.4	0.0
Specialist	0.2	0.8
Optometrist	0.1	0.9

(a) Rate per 100 type 2 diabetes encounters.

(b) Rate per 100 type 2 diabetes problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 8: Type 2 diabetes

Gestational diabetes

Gestational diabetes is a carbohydrate intolerance with onset during the current pregnancy. In Australia, it affects about 6–9% of women during pregnancy but among Indigenous women, the proportion can be as high as 20%. Diabetes during pregnancy can lead to complications for both mother and foetus or newborn. These include babies that are large for gestational age leading to difficult labour and delivery; pregnancy induced hypertension; pre-term birth; pre-eclampsia; uterine bleeding; congenital abnormalities; foetal distress; and neonatal hypoglycaemia, respiratory distress and jaundice (DHAC & AIHW 1999b).

Although the condition usually reverts to normality spontaneously after the birth, 10–50% of those who have had gestational diabetes will develop type 2 diabetes five years later and their babies are at increased risk of developing obesity and diabetes later in life. Therefore, follow-up of these women and their children is important (RACGP and Diabetes Australia 1998). Because oral hypoglycaemic agents are contraindicated in pregnancy, insulin is used if normal glucose levels cannot be achieved by dietary modification alone. Current guidelines recommend that patients with gestational diabetes be managed by a specialist physician and obstetrician from the time of diagnosis (RACGP & Diabetes Australia 1998).

The number of encounters for gestational diabetes (n=12) in the study sample was extremely low, indicating that this is a rare event medically and that patients with this condition are usually not managed in general practice, being referred to specialists instead. It is impossible to obtain a reliable picture of the care of these patients based on such few observations. Therefore, these results are not shown and just a brief description is included here for interest.

There were only 12 encounters at which GPs managed gestational diabetes problems, at a rate of 0.01 per 100 encounters, accounting for 0.008% of all problems. Most (75.7%) of the women managed with this condition were aged 25–44. The most common reasons for encounter were pre/post natal check-up (56.7 per 100 encounters) and seeking referral (18.2 per 100). The main other problems handled at these encounters were pre/post natal check-up (22.0 per 100 encounters) and hypertension (10.4 per 100). Referrals occurred at a rate of 25.0 per 100 problems and were made to endocrinologists, diabetes clinics and diabetes education. Medications were not prescribed and the tests performed or requested were for glucose level monitoring or glucose tolerance.

Other related problems

Hypertension

Hypertension is defined as systolic blood pressure of 140 mmHg or greater; and/or diastolic blood pressure of 90 mmHg or greater in people not taking medication for high blood pressure (WHO 1999). Hypertension is considered a condition in its own right, as well as a major risk factor for coronary heart disease, heart failure, stroke, kidney failure, dementia, premature labour and blindness, with the risk increasing along with the level of blood pressure. When diastolic blood pressure is lowered by 4–6 mmHg over two to three years, it is estimated that the risk of coronary heart disease events reduces by 14% and that of stroke events by 42%. In 1995 about 16% of Australians over 18 years of age had high blood pressure and/or were on treatment for the condition (DHAC & AIHW 1999, Collins et al. 1990).

Current WHO guidelines for the management of hypertension recommend that routine laboratory investigations include urine analysis for blood, protein and glucose; microscopic examination of urine; blood analysis for electrolytes, creatinine, glucose and total cholesterol. Lifestyle measures that are widely agreed to lower blood pressure and that should be considered in all suitable patients are weight reduction, reduction of excessive alcohol consumption, reduction in high salt intake and increase in physical activity. Smoking cessation and healthy eating patterns are important because they contribute to the treatment of associated risk factors and cardiovascular diseases. The guidelines recommend instituting immediate medication treatment for blood pressure and other co-existing conditions in high-risk patients, monitoring blood pressure and other risk factors for 3–6 months before deciding whether to use medications in medium-risk patients, and observing the patient over 6–12 months before deciding whether to give medications in low-risk patients. The main medication classes used are diuretics, beta blockers, calcium antagonists, ACE-inhibitors, angiotensin II antagonists and alpha adrenergic blockers. They are all effective in lowering blood pressure but differ in their side effects and coexisting conditions for which they might be used. Medication combinations may achieve the maximum blood pressure lowering effect with minimum side effects. During the period of evaluation and stabilisation of treatment, patients need to be monitored regularly. Since the treatment of hypertension is usually for life, doctors should provide patients with information on the problem, expected benefits and side effects of treatment, the importance of lifestyle measures and the need for regular follow up (WHO 1999).

Hypertension was the most common problem in general practice, managed on 7,994 occasions (at a rate of 8.2 per 100 encounters), accounting for 5.7% of all problems managed. Of these, 409 (5.1%) were new diagnoses of hypertension (0.4 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 8.5 million encounters for hypertension per year and around 435,000 new cases of hypertension diagnosed in general practice each year. Figure 9 summarises the most frequent observations for all encounters at which hypertension was treated compared with those for new hypertension diagnoses.

Most of the patients managed for hypertension were female (59.3%), reflecting the gender distribution of the total study sample. The majority of patients (91.9%) were aged over 44

years. Eighteen per cent were from non-English-speaking background and 0.6% from Aboriginal or Torres Strait Islander origin. Hypertension encounters were statistically significantly more common among NESB patients than in the whole of the population (10.2 vs 8.2 per 100 encounters respectively, which is a difference of 1.9 [95% CI of the difference is 1.4–2.4]). In the Indigenous group, on the other hand, encounters for hypertension occurred statistically significantly less often (4.3 per 100 encounters, the rate difference between Indigenous patients and all patients is 3.9 [95% CI of the difference is 2.4–5.5]).

A total of 14,837 patient reasons for encounter was recorded at the 7,994 encounters where hypertension was managed. This represents a rate of 185.6 per 100 encounters, considerably above average. Request for cardiac check-up was the most common patient reason for encounter recorded (40.7 per 100 hypertension encounters), followed by hypertension (28.4 per 100). Requests for medication, not necessarily for hypertension, were also frequent reasons (22.2 per 100).

The most common comorbidities managed with hypertension were lipid disorder (8.2 per 100 hypertension encounters) and diabetes (7.7 per 100). Both of these were above average rates, indicating an association between these conditions and hypertension. Depression, sleep disturbance and anxiety were also among the top ten other conditions cared for with hypertension. Overall, GPs treated 9,159 other problems during hypertension encounters. The patients managed at these encounters had a higher comorbidity level than average, with a rate of total problems managed of 214.6 per 100 hypertension encounters.

Medications were used frequently to treat hypertension, at a rate of 104 per 100 problems, highlighting the fact that patients are often given a combination of medications to better manage this condition. At the generic level, several types of medications featured among the top ten including calcium channel blockers (amlodipine, felodipine, verapamil, nifedipine), ACE-inhibitors (enalapril, perindopril, lisinopril), beta blockers (atenolol), diuretics (indapamide) and angiotensin II receptor antagonists (irbesartan). There is a wide range of antihypertensive medications available and the choice of medication depends on several factors such as other co-existing conditions, patient tolerance to side effects and age. Of all medications given for hypertension, ACE-inhibitors represented 31.3%, calcium channel blockers 24.5%, beta blockers 13.6%, diuretics 13.5% and angiotensin II receptor antagonists 6.8%. For the 77% of hypertension encounters where GPs recorded medication status, 10.9% were new medications, that is, they were used for the first time to treat hypertension in these patients. Of these new medications, irbesartan was the most popular—20.4% of all new medications given for hypertension (results not presented).

GPs used other forms of management for hypertension problems at a much lower rate (14.2 per 100 problems) than medication. These included advice on nutrition/weight (3.5 per 100), exercise (1.7 per 100), smoking (0.3 per 100) and other lifestyle factors (0.6 per 100), as well as advice on medication (2.8 per 100) and treatment (0.9 per 100).

Pathology tests were ordered for hypertension at a rate of 11.9 per 100 problems, which is below the average. The most common tests ordered were lipids (3.1 per 100) and electrolytes/urea/creatinine (2.8 per 100). Overall, imaging was rarely used to investigate hypertension (0.6 per 100 problems).

GPs hardly ever referred hypertension patients to other health professionals or services (1.2 per 100 problems), suggesting that hypertension is mostly handled in general practice.

The sex distribution of new cases of hypertension was similar to that of all patients managed for hypertension, with most new diagnoses occurring in the 45–64 age bracket (50.2%). At encounters where newly diagnosed hypertension was managed, similar reasons for contacting the GP were recorded as for hypertension patients overall. Not surprisingly, lipid

disorder (5.2 per 100 encounters for new hypertension problems), diabetes (2.7 per 100) and obesity (2.6 per 100) were among the top ten other problems managed with newly diagnosed hypertension. New cases of hypertension were dealt with somewhat differently. There was less emphasis on giving medications initially (62.1 per 100 problems) and more widespread use of other forms of treatment (42.5 per 100 problems), particularly advice on nutrition and weight (12.7 per 100) and on exercise (6.6 per 100), education (4.2 per 100) and a 'wait and see' approach (3.7 per 100). This would indicate that in many cases, GPs were advising patients to introduce lifestyle measures as a first-line treatment for their hypertension, and reserving medication as a second option for those not achieving blood pressure control by these means alone. Where medications were indicated, the range used to care for new cases was similar to that for hypertension problems overall. The rate at which pathology tests were ordered to investigate new cases of hypertension (38.9 per 100 problems) was higher than that for all hypertension cases. The tests requested most frequently were lipids (9.4 per 100), electrolytes/urea/creatinine (7.7 per 100), full blood count (5.9 per 100) and liver function (3.0 per 100). Imaging tests were uncommon (3.7 per 100 problems), as were referrals to other health professionals or services (3.9 per 100).

Patients

	Per cent
Male	40.7
Female	59.3
Age	
<1–14	0.1
15–24	0.5
25–44	7.4
45–64	38.7
65–74	29.2
75+	24.0
Origin	
NESB	18.3
A&TSI	0.6

Reasons for encounter

	All	New
	n 14,837	n 734
	Rate[a]	
Cardiac check-up*	40.7	30.2
Hypertension*	28.4	25.4
Prescription all*	22.2	8.4
General check-up*	5.2	6.2
Immunisation all*	4.7	4.1
Test results*	3.4	5.4
Diabetes*	3.0	1.3
Back complaint*	2.4	2.5
Cough	2.4	3.0
Blood test endocr/metab	2.2	1.5

Other problems managed

	All	New
	n 9,159	n 447
	Rate[a]	
Lipid disorder	8.2	5.2
Diabetes*	7.7	2.7
Immunisation all*	5.1	4.0
Osteoarthritis*	4.2	3.9
Depression*	2.8	2.5
Menopausal complaint	2.6	2.9
Sleep disturbance	2.4	0.8
Oesophageal disease	2.3	1.3
Anxiety*	2.2	1.6
Asthma	2.0	1.5

Medications

	All	New
	n 8,323	n 254
	Rate[b]	
Atenolol	9.0	5.5
Amlodipine	7.3	3.6
Enalapril mal	6.8	2.0
Indapamide	6.2	2.7
Irbesartan	6.2	9.2
Felodipine	5.9	5.5
Perindopril	5.6	5.1
Verapamil hcl	5.2	1.7
Lisinopril	4.5	1.3
Nifedipine	4.2	2.3

HYPERTENSION

N = 7,994

(5.7% of all problems managed)

New problems = 409

(5.1% of all hypertension problems)

Other treatments

	All	New
	n 1,139	n 174
	Rate[b]	
Advice nutrition/weight	3.5	12.7
Advice medication	2.8	2.0
Advice exercise	1.7	6.6
Counselling — problem	1.2	3.0
Advice/education	1.1	4.2
Advice treatment	0.9	0.9
Observe/wait	0.8	3.7
Advice lifestyle	0.6	2.5
Advice smoking	0.3	0.2
Electrical tracings	0.3	1.0

Pathology

	All	New
	n 958	n 159
	Rate[b]	
Lipids	3.1	9.4
EUC	2.8	7.7
Full blood count	1.5	5.9
Liver function	1.1	3.0
Glucose tolerance	1.1	1.3
Thyroid function	0.3	2.0
Multibiochemical tests	0.3	2.2
Other test NEC	0.3	0.8
Blood test	0.2	1.0
Urine MC&S	0.2	1.7

Imaging

	All	New
	n 48	n 15
	Rate[b]	
X-ray; chest	0.2	1.8
US/CT/contrast	0.1	0.4
Echocardiography	<0.1	0.2
US/CT/contrast; urinary	<0.1	0.6
X-ray; spinal	<0.1	0.0
Test; Doppler	<0.1	0.2
Plain X-ray; bone(s)	<0.1	0.0
X-ray; hip	<0.1	0.0
US/CT/contrast; brain	<0.1	0.3

Referrals

	All	New
	n 97	n 16
	Rate[b]	
Cardiologist	0.3	0.6
ECG	0.3	2.4
Physician	0.1	0.2
Hospital admission	0.1	0.0
Other health profess	0.1	0.2
Holter monitor	0.1	0.3
Specialist	0.1	0.0
Ophthalmologist	<0.1	0.0
Dietician/nutrition	<0.1	0.0
Urologist	<0.1	0.0

(a) Rate per 100 hypertension encounters.

(b) Rate per 100 hypertension problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 9: Hypertension

Hypertension in pregnancy

Hypertension affects about 10% of pregnant women. Hypertension in pregnancy includes both pre-eclampsia and chronic hypertension. Pre-eclampsia refers to hypertension developing in the second half of pregnancy in women with normal blood pressure before pregnancy, whose blood pressure returns to normal within three months after delivery. Pre-eclampsia can affect the woman's liver, kidneys, brain, clotting system and lead to impaired placental function and consequent foetal growth retardation. Current Australian guidelines recommend that for the management of hypertension in pregnancy the obstetrician should remain the doctor in charge and seek advice from other specialists when indicated (Brown et al. 1999, Australasian Society for the Study of Hypertension in Pregnancy 1993).

The number of encounters for hypertension in pregnancy in the study sample was extremely low (n=7), indicating that patients with this condition are usually not managed in general practice, being referred to specialists instead. It is impossible to obtain a reliable picture of the care of these patients based on such few observations. Therefore, these results are not shown.

Of the seven contacts with hypertension in pregnancy, six were new diagnoses. In all instances patients were aged 25–44 and consulted the GP for a pre/post natal check-up. All new cases were referred for hospital admission. No treatments or investigations were recorded at these encounters.

Lipid disorders

Lipid disorders (dyslipidaemias) refer to abnormal levels of lipids and lipoproteins in the blood. They may lead to coronary heart disease, peripheral vascular disease, or skin, pancreatic or neurological conditions. Sometimes raised lipids levels are a manifestation of another condition such as diabetes, excessive alcohol intake, chronic kidney failure or thyroid disease, or result from the use of certain medications. Lipids tests have become common since the recommendation that all adult Australians should have their plasma lipids measured to help assess their risk of cardiovascular disease. Diet is the cornerstone of management of lipid disorders. Weight reduction and increased physical activity may help too. If medication therapy is needed, the choice of medication depends on the lipid abnormality. The range of lipid-lowering medications covers statins, fibrates, resins, nicotinic acid and fish oils, the first two being the most widely used (Simons 2000, Sullivan 2000, Colquhoun 2000).

Lipid disorders were managed on 2,392 occasions (at a rate of 2.5 per 100 encounters) and represented 1.7% of all problems handled by GPs. New problems constituted 13.1% (0.3 per 100 encounters) of all lipid disorder problems. Based on 103 million Medicare-claimed general practice consultations, this equates to about 2.5 million encounters for lipid disorders per year and around 333,000 new cases of lipid disorders diagnosed in general practice each year. Figure 10 summarises the most frequent observations for all encounters at which lipid disorders were treated compared with those for new lipid disorder diagnoses.

Males and females were managed for lipid disorders in equal proportions, unlike the distribution in the total data set (57.7% females). The largest proportion of patients (47.0%) was in the age range 45–64 years. Those from non-English-speaking background constituted 22.2% of patients and 0.4% were Aboriginals or Torres Strait Islanders. There were statistically significant differences between the rates of encounters for lipid disorder problems among these groups, being higher in the NESB and lower in the Indigenous populations compared with all patients (3.7, 0.8 and 2.5 per 100 encounters respectively). The rate difference between NESB and all patients is 1.2 (95% CI of the difference is 0.9–1.5), and between Indigenous and all patients the rate difference is 1.7 (95% CI of the difference is 0.8–2.6).

Of the 4,383 reasons for encounter recorded at these encounters, lipid disorders were the most common (27.2 per 100 lipid disorder encounters), followed by prescription requests for any condition (20.5 per 100), test results (19.5 per 100) and cardiac check-ups (14.1 per 100). The rate of 183.2 reasons for encounter per 100 encounters in these patients was above average.

Hypertension was a very frequent co-existing problem with lipid disorders, managed at a rate of 27.6 per 100 lipid disorder encounters. Diabetes was also relatively common in these patients (8.1 per 100). Both these comorbidities were well above the average rate. GPs handled a total of 3,068 other problems at encounters for lipid disorders. The high level of co-existing problems in these patients is indicated by the very high rate of total problems managed at hypertension encounters (228.3 per 100 encounters).

Medications were used to treat lipid disorders at a lower rate (66.1 per 100 problems) than average. Statins were by far the most popular medications given, making up 90.8% of all medications given for this condition. Other types of lipid-lowering medications also among the top ten but prescribed at a much lower rate were fibrates (gemfibrozil) and resin binders (cholestyramine). For the 73% of lipid disorder encounters where GPs recorded medication

status, 23.4% were new medications, that is, they were used for the first time to treat this condition in these patients. Of these new medications, atorvastatin was the most popular, representing 55.5% of all new medications given for lipid disorders (results not presented).

Other treatments for lipid disorders were also used relatively frequently (35.7 per 100 problems). Not surprisingly, these were mainly in the form of advice and education on lifestyle issues and medication. GPs gave patients advice on nutrition and weight (22.5 per 100), exercise (3.9 per 100), other lifestyle factors (1.1 per 100), medication use (2.1 per 100) and treatment (0.8 per 100).

Pathology tests were very common in the investigation and management of lipid disorders (53.3 per 100 problems) compared with the average (17.0 per 100). As would be expected, lipid tests ranked first (31.7 per 100), followed by liver function (7.4 per 100) and glucose tolerance tests (3.8 per 100). Imaging was rarely performed for this condition (0.2 per 100 problems).

GPs referred patients managed for lipid disorders to other health professionals and services only occasionally (1.2 per 100 problems). Given that diet is such an integral part of the treatment of this condition, it is interesting to note that referrals to dieticians/nutritionists occurred at a rate of only 0.7 per 100 problems.

The age and sex profile of new lipid disorder cases was similar to that of patients managed for this condition overall. The patient reason most often recorded at encounters for newly diagnosed lipid disorders was getting test results (47.0 per 100 encounters), indicating that these tests usually form the basis for diagnosis. Lipid disorders (21.0 per 100) and cardiac check-up (10.6 per 100) were other common recorded reasons for encounter. As with all people having lipid disorders, hypertension (17.2 per 100 encounters) and diabetes (6.7 per 100) were the most frequent other problems managed with new cases of lipid disorders. For the initial management of this condition, GPs tended to rely less on medication (38.9 per 100 problems) and more on other forms of treatment (68.4 per 100), especially advice on nutrition/weight (49.8 per 100) and exercise (7.6 per 100). When medications were given, these were generally statins (92.3% of all medications used). Pathology tests were ordered less often in new cases (32.6 per 100 problems) than for lipid disorder problems overall, lipids tests being the most frequently ordered (22.8 per 100). Imaging was virtually excluded from the range of investigations undertaken for this problem. The rate of referrals remained low among new lipid disorder cases (4.1 per 100 problems), even to dietician/nutrition professionals (3.3 per 100).

Patients

	Per cent
Male	48.9
Female	51.1
Age	
<1–14	0.1
15–24	0.7
25–44	12.1
45–64	47.0
65–74	28.9
75+	11.3
Origin	
NESB	22.2
A&TSI	0.4

Reasons for encounter

	All	New
	n 4,383	n 553
	Rate[(a)]	
Lipid disorder	27.2	21.0
Prescription all*	20.5	7.8
Test results*	19.5	47.0
Cardiac check-up*	14.1	10.6
Blood test endocr/metab	12.8	10.3
Hypertension*	8.5	4.4
Blood test NOS	4.5	3.3
General check-up*	4.4	3.2
Immunisation all*	4.1	2.4
Diabetes*	3.0	3.6

Other problems managed

	All	New
	n 3,068	n 346
	Rate[(a)]	
Hypertension*	27.6	17.2
Diabetes*	8.1	6.7
Immunisation all*	4.4	2.2
IHD without angina	4.4	0.7
Menopausal complaint	3.1	4.0
Osteoarthritis*	3.0	1.8
Oesophageal disease	2.9	2.3
Depression*	2.9	2.3
Abnormal test results*	2.8	7.4
Back complaint*	1.8	1.2

Medications

	All	New
	n 1582	n 122
	Rate[(b)]	
Simvastatin	29.3	12.7
Atorvastatin	20.9	17.0
Pravastatin	7.1	5.8
Gemfibrozil	4.3	1.8
Fluvastatin	2.7	0.0
Aspirin	0.2	0.0
Cholestyramine	0.2	0.0
Enalapril mal	0.2	0.0
Frusemide	0.1	0.0
Captopril	0.1	0.5

LIPID DISORDERS

N = 2,392

(1.7% of all problems managed)

New problems = 313

(13.1% of all lipid disorder problems)

Other treatments

	All	New
	n 855	n 214
	Rate[(b)]	
Advice nutrition/weight	22.5	49.8
Advice exercise	3.9	7.6
Counselling — problem	2.2	2.6
Advice medication	2.1	1.7
Advice/education	1.6	2.7
Advice lifestyle	1.1	1.1
Advice treatment	0.8	0.6
Advice health/body	0.6	0.8
Observe/wait	0.2	1.1
Advice alcohol	0.2	0.1

Pathology

	All	New
	n 1,275	n 102
	Rate[(b)]	
Lipids	31.7	22.8
Liver function	7.4	2.6
Glucose tolerance	3.8	1.3
Full blood count	2.4	1.6
EUC	1.8	0.3
Cardiac enzymes	1.5	0.8
Other test NEC	1.0	0.2
Blood test	0.9	1.3
Multibiochemical tests	0.7	1.0
Thyroid function	0.6	0.0

Imaging

	All	New
	n 4	n 1
	Rate[(b)]	
US/CT/contr; abdomen	0.1	0.4
US/CT/contrast; brain	0.1	0.0
Plain X-ray; bone(s)	<0.1	0.0
X-ray; chest	<0.1	0.0

Referrals

	All	New
	n 29	n 13
	Rate[(b)]	
Dietician/nutrition	0.7	3.3
Cardiologist	0.1	0.2
Physician	0.1	0.3
Other health profess	0.1	0.0
Dermatologist	0.1	0.0
Interpreter	<0.1	0.0
ECG	<0.1	0.0
Hypnotherapy	<0.1	0.0
Surgeon	<0.1	0.2
Hospital admission	<0.1	0.0

(a) Rate per 100 lipid disorder encounters.

(b) Rate per 100 lipid disorder problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 10: Lipid disorders

Cardiovascular check-up

GPs conducted cardiovascular check-ups on 1,204 occasions (rate 1.2 per 100 encounters), amounting to 0.8% of all problems managed. Of the total, 101 (8.4%) were new cases (rate 0.1 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 1.3 million encounters for cardiovascular check-ups per year. Figure 11 summarises the most frequent observations for all encounters at which cardiovascular check-ups were held compared with those for new cardiovascular check-ups.

Most patients undergoing a cardiovascular check-up were in the 45 years and over age range (84.9%) and the majority were women (61.2%). People from non-English-speaking background made up 16.5% of these patients and 0.2% were from Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of encounters for cardiovascular check-up in NESB patients compared with all patients. But cardiovascular check-ups were statistically significantly less common among the Indigenous population (NESB 1.4, Indigenous 0.3, all patients 1.2 per 100 encounters, and the rate difference between Indigenous patients and all patients is 1.0 [95% CI of the difference is 0.3–1.6]).

Of the 2,365 patient reasons for encounter recorded, cardiac check-up (80.5 per 100 encounters), requests for medication (15.4 per 100), vaccinations (10.2 per 100) and general check-up (5.6 per 100) were the most common. The rate of reasons for encounter in these patients (196.4 per 100) was well above average.

Other problems managed at these encounters included vaccinations (11.3 per 100 cardiovascular check-up encounters), providing prescriptions (7.5 per 100), female gynaecological examination (4.8 per 100), diabetes (3.4 per 100) and lipid disorder (3.2 per 100), among a total of 1,422 problems.

Medications were given after cardiovascular check-up at a rate of 41.4 per 100 problems, which is considerably below average. The following were the most frequent types: calcium channel blockers (amlodipine, felodipine), beta blockers (atenolol, metoprolol), ACE-inhibitors (enalapril, perindopril, captopril), diuretics (indapamide, frusemide) and angiotensin II receptor antagonists (irbesartan). Of all medications used after cardiovascular check-ups, ACE-inhibitors represented 26.5%, calcium channel blockers 20.4%, diuretics 14.1%, beta blockers 13.1%, angiotensin II receptor antagonists 5.2%, alpha blockers 3.9%, antiplatelet medications 2.5%, anticoagulants 1.7%, statins 1.6%, antiarrhythmics 1.1% and nitrates 1.1%. For the 69% of cardiovascular check-up encounters where GPs recorded medication status, 8.8% were new medications, that is, they were used for the first time after a cardiovascular check-up in these patients. Of these new medications, irbesartan was the most popular—14.0% of all new medications given after a cardiovascular check-up (results not presented).

This set of results suggests some confusion in the GPs' minds about how to label the problem they are managing at these encounters. A label of cardiovascular check-up implies that the patient is well and therefore does not require medication. However, at these encounters only 8.4% were new cases and there was an overall medication use rate of 41.4 per 100 problems, of which only 8.8% were given for the first time. This indicates that at many of these contacts GPs were actually managing a cardiovascular problem already diagnosed previously but, instead of recording the real problem being managed, they labelled it as 'check-up'. For instance, they may have been dealing with cases of hypertension that was controlled by medication so the patients were 'well' and, in the GPs' mind, not hypertensive any more. Therefore, they chose not to label the problem 'hypertension'.

Other treatments were provided at a rate of 16.4 per 100 problems and involved mainly giving advice on nutrition/weight, exercise, other lifestyle issues, medication and treatment.

Pathology testing was requested at a rate of 10.9 per 100 problems, which is below the average. Lipids (4.2 per 100), glucose tolerance (1.7 per 100) and electrolytes/urea/creatinine (1.3 per 100) were the tests ordered most frequently. Imaging was not generally used as part of cardiovascular check-ups.

Patients undergoing cardiovascular check-ups were referred to other health professionals or services very infrequently (1.5 per 100 problems). When this happened, it was mostly to cardiologists or for electrocardiography.

While the general pattern of encounters for new cardiovascular check-ups was similar to that described above, it is interesting to note that a relatively large proportion of patients (30.1%) being examined for the first time was aged 25–44 years. This indicates significant awareness among both patients and GPs of the importance of prevention and monitoring of cardiovascular disease from a younger age.

Patients

	Per cent
Male	38.8
Female	61.2
Age	
<1–14	1.0
15–24	2.1
25–44	12.1
45–64	35.7
65–74	26.5
75+	22.7
Origin	
NESB	16.5
A&TSI	0.2

Reasons for encounter

	All	New
	n 2,365	n 208
	Rate[(a)]	
Cardiac check-up*	80.5	80.3
Prescription all*	15.4	6.0
Immunisation all*	10.2	10.3
General check-up*	5.6	6.3
Female genital check*	3.7	4.5
Blood test endocr/metab	3.6	2.2
Test results*	3.4	<0.8
Cough	2.1	2.0
Rash*	2.0	3.5
Hypertension*	1.9	<0.8

Other problems managed

	All	New
	n 1,422	n 129
	Rate[(a)]	
Immunisation all*	11.3	11.6
Prescription all*	7.5	1.3
Female genital check*	4.8	6.1
Diabetes*	3.4	2.8
Lipid disorder	3.2	1.6
Osteoarthritis*	2.6	5.3
Menopausal complaint	2.5	<0.8
Dermatitis	2.1	3.4
Blood test endocr/metab	2.1	1.7
URTI, acute	2.0	<0.8

Medications

	All	New
	n 499	n 14
	Rate[(b)]	
Amlodipine	3.4	1.2
Atenolol	3.0	0.0
Enalapril mal	2.7	0.0
Indapamide	2.3	0.0
Irbesartan	1.9	0.5
Metoprolol	1.8	0.0
Perindopril	1.8	3.6
Felodipine	1.7	1.4
Captopril	1.7	0.0
Frusemide	1.7	2.0

CARDIOVASCULAR CHECK-UP

N = 1,204

(0.8% of all problems managed)

New problems = 101

(8.4% of all cardiovascular check-up problems)

Other treatments

	All	New
	n 198	n 21
	Rate[(b)]	
Advice nutrition/weight	3.3	1.3
Advice exercise	2.9	0.0
Advice medication	1.7	1.4
Reassurance, support	1.5	5.4
Advice/education	1.5	1.9
Counselling — problem	1.3	2.9
Advice lifestyle	1.3	4.9
Advice treatment	0.7	1.0
Observe/wait	0.5	0.0
Electrical tracings	0.3	0.0

Pathology

	All	New
	n 131	n 10
	Rate[(b)]	
Lipids	4.2	5.9
Glucose tolerance	1.7	1.8
EUC	1.3	0.0
Full blood count	0.9	1.1
Liver function	0.9	0.0
Other test NEC	0.5	0.0
Prostate specific Ag	0.3	0.0
Multibiochemical tests	0.2	0.5
Coagulation	0.1	0.0
Digoxin	0.1	0.0

Imaging

	All	New
	n 2	n 0
	Rate[(b)]	
Mammography; F	0.1	0.0
X-ray; arm	0.1	0.0

Referrals

	All	New
	n 18	n 3
	Rate[(b)]	
Cardiologist	0.6	2.1
ECG	0.5	0.4
Endocrinologist	0.2	0.0
Specialist	0.1	0.0
Other health profess	0.1	0.0

(a) Rate per 100 cardiovascular check-up encounters.

(b) Rate per 100 cardiovascular check-up problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 11: Cardiovascular check-up

Overweight and obesity

The body mass index (BMI) gives a measure of overweight and obesity. It is calculated by dividing a person's weight (kg) by height squared (m^2). A BMI of 25 or greater indicates overweight and 30 or greater indicates obesity. People who are overweight or obese are at increased risk of coronary heart disease, stroke, heart failure and type 2 diabetes. High blood pressure and high blood cholesterol are also associated with overweight and obesity. Obesity can lead to reduced life expectancy as well. An estimated 7.5 million adult Australians (aged 25 years and over) are overweight and almost 2.6 million of these people are obese. In Australia, men are more likely to be overweight than women and the proportion of overweight people increases with age, peaking at age 55–74 years. Although the proportion of overweight Indigenous men is similar to that of all Australian men, the rate of obesity is higher among Indigenous men. Rates of overweight and obesity are much higher for Indigenous women than for all Australian women (AIHW 2001).

General practitioners are seen as having a key influence in the community in creating awareness of the risks associated with overweight and obesity. As such they are expected to provide leadership in the prevention of overweight and obesity (NHMRC 1997). Current general practice guidelines recommend that GPs educate patients about behaviours such as modifying their diet (RACGP 1996). However, although Australian GPs have a strong interest in nutrition, they appear to lack time, confidence and adequate knowledge to provide nutrition counselling (Helman 1997). Studies have shown that most nutrition advice given by GPs is disease specific and that the main conditions for which advice is given are heart disease, hyperlipidaemia, obesity and diabetes (Helman 1997). There is evidence that most patients think that their GP should be interested in their weight and exercise (Richmond et al. 1996). When counselling on weight reduction, GPs have tended to use verbal advice alone, referrals being rare (Heywood et al. 1994). However, a combination of the skills of a dietician and the patient's GP has been shown to lead to better outcomes in terms of weight reduction in overweight patients (Pritchard et al. 1999).

SAND, a substudy of the BEACH program, provides information on the rates of overweight and obesity among adult patients (aged 18 years and over) attending general practice for any problem, not just those being managed for overweight and obesity (Sayer et al 2000). This is based on height and weight as reported by the patients. For the period described in this report, for a sample of 30,485 patient encounters, these rates were: 32.8% overweight and 18.4% obese, making a total of 51.2% overweight or obese. This compares with 56% overweight and 19% obese among the general population aged 18 years and over, based on physical measurements (AIHW 1999). In the SAND sample, a higher proportion of males were overweight or obese (57.2%) than females (47.0%). The proportions of overweight or obese patients increased with age and were mostly in the 45–64 and 65–74 year ranges.

Overweight and obesity problems were managed at 668 encounters (at a rate of 0.7 per 100 encounters), accounting for 0.5% of all problems seen. Given that the prevalence of overweight and obesity among general practice patients in the study was 51.2%, the rate of management of this problem is very low, clearly indicating that this is an area that GPs could tackle more vigorously. New problems represented 107 (16.0%) of all overweight and obesity problems (0.1 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 710,000 encounters for overweight and obesity problems per year and around 114,000 new cases of overweight and obesity diagnosed in general practice each year. Figure 12 summarises the most frequent observations for all encounters at which overweight and obesity was treated compared with those for new overweight and obesity diagnoses.

Females made up the vast majority of patients treated for this problem (69.9%). This is interesting given that the prevalence of overweight and obesity in general practice patients was higher in males than in females and suggests that women are more likely than men to seek assistance to shed excess weight. Patients were largely in the 25–44 (37.2%) and 45–64 (40.9%) year ranges. Only 7.2% of patients were aged 65–74, which is one of the age groups among which overweight and obesity is most prevalent. This suggests that more could be done to encourage these patients to control their weight. Sixteen per cent of patients were of non-English-speaking background and 1.8% were of Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of encounters for overweight and obesity problems in the NESB or Indigenous populations compared with all patients (0.8, 1.0 and 0.7 per 100 encounters respectively).

A total of 1,141 patient reasons for encounter was recorded at encounters where overweight and obesity was treated, at an above average rate of 170.8 per 100 encounters. Obesity (22.2 per 100 overweight and obesity encounters) and overweight (21.7 per 100) were the most common reasons. Endocrine/metabolic symptoms and check-up, cardiac check-up, hypertension, back complaints and depression were also among the top ten reasons for encounter.

GPs managed 723 other problems at these encounters. The most frequent comorbidities were hypertension (16.8 per 100 encounters), lipid disorder (5.2 per 100), depression (4.4 per 100) and diabetes (3.8 per 100). The rates of hypertension and diabetes in these patients were double the average for the total data set, indicating a strong association between the conditions.

Medication use was not common in the management of overweight and obesity (23.6 per 100 problems). The most widely used were appetite suppressants (phentermine and diethylpropion hydrochloride) and herbal remedies, accounting for 37.4%, 16.4% and 36.6% of all medications given for overweight and obesity problems respectively.

GPs relied much more on other forms of treatment to manage this condition (105.8 per 100 problems). These included providing advice on nutrition/weight (71.5 per 100), advice on exercise (26.3 per 100) and advice on other lifestyle issues (2.1 per 100).

When pathology tests were ordered (at a rate of 21.2 per 100 problems), they were mostly for lipids (6.7 per 100), glucose tolerance (4.0 per 100) and thyroid function (2.7 per 100). Imaging was not used to investigate overweight and obesity problems.

Overall, referrals to other health professionals were much lower than might have been expected in these cases (8.9 per 100 problems). In particular, referrals to dieticians/ nutritionists occurred at a rate of only 6.2 per 100 problems.

Most new cases of overweight and obesity were females (73.4%) and in the age group 25–44 (46.2%). At these encounters, the same range of reasons for seeking GP assistance was recorded as for all patients managed for overweight and obesity. The most frequent other conditions cared for in new cases of overweight and obesity were depression (8.7 per 100 problems) and hypertension (7.9 per 100). Medications were given at the same rate as that of all overweight and obesity cases, the most popular being phentermine and diethylpropion hydrochloride. Non-medication management and investigations of new cases were similar to those used in all problems. GPs referred patients they managed with newly diagnosed overweight and obesity at a rate of 10.3 per 100 problems, almost exclusively to dieticians/nutritionists (9.5 per 100).

Patients

	Per cent
Male	30.1
Female	69.9
Age	
<1–14	2.8
15–24	9.5
25–44	37.2
45–64	40.9
65–74	7.2
75+	2.5
Origin	
NESB	16.5
A&TSI	1.8

Reasons for encounter

	All	New
	n 1,141	n 194
	Rate[(a)]	
Obesity (bmi > 30)	22.2	25.1
Overweight (bmi 25–30)	21.7	12.8
Endocr/metab symptom	9.9	19.2
Cardiac check-up*	8.6	6.5
Prescription all*	7.4	10.1
Hypertension*	5.3	3.8
Back complaint*	4.6	5.4
Endocrine check-up*	4.1	2.8
Depression*	3.9	11.0
General check-up*	3.7	5.4

Other problems managed

	All	New
	n 723	n 106
	Rate[(a)]	
Hypertension*	16.8	7.9
Lipid disorder	5.2	3.2
Depression*	4.4	8.7
Diabetes*	3.8	1.6
Osteoarthritis*	3.3	0.9
Back complaint*	3.1	3.3
Female genital check*	2.5	2.0
Sprain/strain*	2.2	4.0
URTI, acute	2.1	0.9
Anxiety*	2.0	<0.5

Medications

	All	New
	n 158	n 25
	Rate[(b)]	
Phentermine	8.9	13.6
Herbal remedy NEC	8.7	1.9
Diethylproprion hcl	3.9	6.7
Protein/Glucose/Vit/Min	0.7	0.3
Antiobesity	0.4	0.0
Atorvastatin	0.3	0.0
Frusemide	0.1	0.0
Gliclazide	0.1	0.0
Sodium valproate	0.1	0.0
Lisinopril	0.1	0.0

OVERWEIGHT and OBESITY

N = 668

(0.5% of all problems managed)

New problems = 107

(16.0% of all overweight and obesity problems)

Other treatments

	All	New
	n 707	n 113
	Rate[(b)]	
Advice nutrition/weight	71.5	73.2
Advice exercise	26.3	21.3
Advice lifestyle	2.1	1.4
Counselling — problem	1.0	2.3
Advice treatment	0.9	1.0
Advice/education	0.8	0.4
Other procedures NEC	0.7	1.7
Advice health/body	0.5	0.0
Counselling psychol	0.3	0.0
Reassurance, support	0.2	0.0

Pathology

	All	New
	n 142	n 24
	Rate[(b)]	
Lipids	6.7	7.1
Glucose tolerance	4.0	1.2
Thyroid function	2.7	4.8
Liver function	1.7	2.9
Full blood count	1.7	2.2
EUC	1.0	0.2
Blood test	0.7	3.2
Multibiochemical tests	0.6	0.0
Hormone assay	0.6	0.8
Urine MC&S	0.3	0.0

Imaging

	All	New
	n 1	n 1
	Rate[(b)]	
US/CT/contr; abdomen	0.1	0.8

Referrals

	All	New
	n 60	n 11
	Rate[(b)]	
Dietician/nutrition	6.2	9.5
Surgeon	0.6	0.0
Hydrotherapy	0.3	0.0
Endocrinologist	0.3	0.0
Hospital admission	0.3	0.0
Acupuncture	0.3	0.0
Psychologist	0.2	0.0
Paediatrician	0.2	0.0
Allied health profess	0.2	0.0
Other health profess	0.1	0.0

(a) Rate per 100 overweight and obesity encounters.

(b) Rate per 100 overweight and obesity problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 12: Overweight and obesity

Smoking

Smoking here refers to tobacco use in the form of packet cigarettes, roll-your-own cigarettes, pipes and cigars. Tobacco smoking increases the risk of coronary heart disease, stroke, peripheral vascular disease, some cancers and respiratory conditions such as asthma and emphysema. It is estimated that about 3.5 million adult Australians smoke tobacco products. About 26% of men and 21% of women smoke and the highest proportion of smokers is among those aged 18–34 years. After age 35, smoking rates decline with increasing age, to be lowest in those aged 75 years and above. Adult Indigenous Australians are at least twice as likely to smoke as other Australian adults (AIHW 2001).

Nicotine replacement therapy is an effective aid in smoking cessation (Silagy et al. 1994). Current general practice guidelines recommend that GPs educate patients about modifying behaviours such as smoking (RACGP 1996). Advice to stop smoking from GPs has been shown to reduce smoking rates among patients in Australia and there is evidence that most patients think that their GP should be interested in their smoking (Richmond et al. 1996). When counselling on smoking, GPs have tended to use verbal advice alone, referrals being rare (Heywood et al. 1994).

From the SAND substudy of the BEACH program, we have information on the rates of smoking among adult patients (aged 18 years and over) attending general practice for any problem (Sayer et al 2000). For the period described in this report, for a sample of 30,265 patient encounters, these rates were: 19.2% daily smokers, 5.6% occasional smokers and 27.0% previous smokers.

GPs managed smoking on 275 occasions (0.3 per 100 encounters), which represents 0.2% of all problems. The rate of management of smoking appears quite low given that almost one in five GP encounters with adults are with daily smokers. New problems accounted for 71 (25.8%) of all smoking problems (0.1 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 292,000 encounters at which smoking is managed per year and around 75,000 new cases of smoking problems treated in general practice each year. Figure 13 summarises the most frequent observations for all encounters at which smoking was treated compared with those for new smoking problems.

Slightly more males (53.0%) than females were managed for smoking problems, unlike the proportions attending general practice as a whole (57.7% females) and most of these patients (51.8%) were in the age range 25–44. About 12% of patients were of non-English-speaking background and 0.9% were of Aboriginal or Torres Strait Islander origin. There were no statistically significant differences between the rates of encounters for smoking problems in the NESB or Indigenous populations compared with all patients (0.2, 0.3 and 0.3 per 100 encounters respectively).

Smoking was the patient reason recorded most often at these encounters (51.5 per 100 encounters). Among other reasons were seeking health advice, obtaining test results and prescriptions, having cough and throat symptoms, and requesting a cardiovascular check-up. This suggests that in about half these encounters the management of smoking was instigated by the patient and in the other half it was opportunistic care initiated by the GP.

The most frequent other conditions managed with smoking problems included upper respiratory tract infections (7.9 per 100 encounters), hypertension (6.1 per 100) and depression (5.9 per 100). Acute bronchitis, asthma and lipid disorder were also among the top ten co-existing problems.

GPs used medications to help patients quit smoking at a rate of 44.7 per 100 problems, which is well below the average. Overwhelmingly this was in the form of nicotine therapy (97.2% of all medications given).

GPs relied more on other forms of therapy (73.8 per 100 problems), mainly giving patients advice related to smoking (64.0 per 100). They also provided reassurance and advice on other lifestyle issues.

Pathology tests were seldom requested in the management of smoking problems (5.8 per 100 problems). Lipids and glucose tolerance tests were the main types ordered. Imaging, in the form of chest X-rays, was also rare (1.4 per 100 problems).

Generally GPs themselves treated patients for smoking problems as the referral rate was very low (2.2 per 100 problems). Interestingly, hypnotherapy was at the top of the list of referrals to assist with quitting smoking.

The pattern of encounters for new cases of smoking problems was the same as that for all encounters during which smoking problems were managed.

Patients

	Per cent
Male	53.0
Female	47.0
Age	
<1–14	0.0
15–24	11.5
25–44	51.8
45–64	28.8
65–74	6.1
75+	1.7
Origin	
NESB	11.7
A&TSI	0.9

Reasons for encounter

	All	New
	n 511	n 140
	Rate[(a)]	
Tobacco abuse	51.5	54.1
Health educat/advice	8.6	10.5
Test results*	7.7	8.6
Prescription all*	7.5	12.8
Cough	7.2	8.9
Cardiac check-up*	5.6	4.8
Throat symptom	5.4	9.3
Oral contraception*	3.5	1.4
Immunisation all*	3.1	5.4
Female genital check*	3.0	5.3

Other problems managed

	All	New
	n 359	n 86
	Rate[(a)]	
URTI, acute	7.9	7.5
Hypertension*	6.1	3.8
Depression*	5.9	<0.8
Immunisation all*	4.9	10.1
Female genital check*	4.9	9.2
Acute bronchitis	4.7	3.9
Asthma	3.8	3.6
Lipid disorder	3.4	1.7
Contraception, other	3.4	2.7
Viral disease NOS	3.1	2.4

Medications

	All	New
	n 123	n 49
	Rate[(b)]	
Nicotine	43.4	67.2
Doxycycline hcl	0.9	2.2
Oxazepam	0.2	0.0
Senega + Ammonia	0.1	0.0
Nefazodone	0.1	0.0

SMOKING

N = 275

(0.2% of all problems managed)

New problems = 71

(25.8% of all smoking problems)

Other treatments

	All	New
	n 203	n 41
	Rate[(b)]	
Advice smoking	64.0	48.2
Other procedures NEC	3.0	2.1
Reassurance, support	1.3	0.4
Advice treatment	1.2	0.4
Counselling — problem	1.0	4.0
Advice exercise	0.7	1.4
Advice nutrition/weight	0.7	0.0
Advice medication	0.6	0.0
Other admin	0.5	2.1
Counselling psychol	0.3	0.0

Pathology

	All	New
	n 16	n 5
	Rate[(b)]	
Lipids	1.8	3.0
Glucose tolerance	1.4	1.4
Liver function	1.1	1.4
EUC	0.7	0.0
Full blood count	0.6	1.4
Blood grouping/typing	0.3	0.0

Imaging

	All	New
	n 4	n 0
	Rate[(b)]	
X-ray; chest	1.3	0.0

Referrals

	All	New
	n 6	n 1
	Rate[(b)]	
Hypnotherapy	1.3	1.4
Other health profess	0.6	0.0
ECG	0.2	0.0
Hospital admission	0.1	0.0
Psychologist	0.1	0.0

(a) Rate per 100 smoking encounters.

(b) Rate per 100 smoking problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

Figure 13: Smoking

Peripheral vascular disease

Peripheral vascular disease is caused by atherosclerosis (a thickening or hardening of the walls of a blood vessel) and results in a reduced blood supply or impaired return of blood affecting the limbs. This ranges from asymptomatic disease, through pain on walking, to pain at rest and limb-threatening ischaemia that can lead to amputation. The condition occurs mainly among the elderly and claims over 2,000 lives in Australia each year. Rehabilitation of elderly patients after amputation can prove difficult, with high community costs. Peripheral vascular disease shares many risk factors with ischaemic heart disease (AIHW 2001).

Investigations to help in diagnosing the condition include exercise testing to provide an objective measurement of walking distance, and duplex ultrasound scanning or arteriography to delineate the location and assess the extent of disease. Modification of risk factors is essential to reduce the likelihood of death from myocardial infarction or stroke in people with peripheral vascular disease. All patients should be advised to stop smoking, take regular exercise and lose weight if appropriate. They should also be screened for lipid disorders and diabetes. Treatment with antiplatelet agents such as aspirin is beneficial because it reduces the risk of cardiovascular events. Pain relievers may also be needed to numb severe pain. Exercise programs can significantly improve pain free and maximum walking distances (Beard 2000).

Peripheral vascular disease was managed at 215 encounters, at a rate of 0.2 per 100 encounters, amounting to 0.1% of all problems managed. Forty-five (20.9%) of these were new problems (0.05 per 100 encounters). Based on 103 million Medicare-claimed general practice consultations, this equates to about 228,000 encounters for peripheral vascular disease per year and around 48,000 new cases of peripheral vascular disease diagnosed in general practice each year. Figure 14 summarises the most frequent observations for all encounters at which peripheral vascular disease was treated compared with those for new peripheral vascular disease diagnoses.

Patients treated for this condition were more likely to be male (62.7%) than in the total data set (42.3%) and most patients were aged 65 years and over (70.1%). People from non-English-speaking background represented 13.6% of patients and those of Aboriginal or Torres Strait Islander origin accounted for 0.7%. There were no statistically significant differences between the rates of encounters for peripheral vascular disease problems in the NESB or Indigenous populations compared with all patients (0.2, 0.1 and 0.2 per 100 encounters respectively).

Of the 402 patient reasons for encounter recorded when peripheral vascular disease was managed, the most common were peripheral vascular disease (26.3 per 100 encounters), leg/thigh complaint (21.6 per 100) and medication requests for any condition (14.9 per 100). The relative number of reasons for encounter at these encounters (186.9 per 100) was above average.

The problems that GPs managed most frequently with peripheral vascular disease were hypertension (14.1 per 100 peripheral vascular disease encounters), diabetes (9.8 per 100), lipid disorder (7.4 per 100) and ischaemic heart disease without angina (4.1 per 100). The rates of all these comorbidities were much higher than average, indicating an association between the conditions and peripheral vascular disease. Overall, there were 265 other problems managed at peripheral vascular disease encounters. The high rate of total problems managed in these patients (223.2 per 100 encounters) points to a high comorbidity level in these patients.

Medications were used in the management of peripheral vascular disease at a relatively low rate (46.9 per 100 problems). Antiplatelet agents (aspirin), anticoagulants (warfarin) and calcium channel blockers (nifedipine) were the medication types given most often (11.6, 7.6 and 6.3 per 100 problems respectively). Of all medications used for peripheral vascular disease, aspirin represented 24.6%, warfarin 16.1% and nifedipine 13.3%.

Other forms of treatment for this condition were provided less often (30.7 per 100 problems). These were mainly in the form of advice on treatment (7.5 per 100) and advice on smoking (4.9 per 100). Counselling on nutrition/weight, exercise and on the condition itself were also among the top ten other treatments given.

Pathology tests were ordered for peripheral vascular disease at a rate of 15.8 per 100 problems, which is about average. The most frequent of these were coagulation tests (4.9 per 100), consistent with the use of anticoagulant medication in these patients, and lipids (2.9 per 100).

Imaging was requested more frequently than the average to study peripheral vascular disease (6.5 per 100 problems), the main form being Doppler imaging.

Referrals to other health professionals or services occurred relatively often overall (20.5 per 100 problems). They were most frequently to vascular surgeons (7.0 per 100), other surgeons (3.4 per 100), Doppler testing (2.8 per 100) and for hospital admission (2.6 per 100).

As there were only 45 encounters where GPs managed new problems, these results are discussed briefly and should be interpreted with caution. New cases of peripheral vascular disease were more evenly distributed among the sexes (females 51.6%). Other characteristics of these patients and their management were generally similar to those of peripheral vascular disease cases overall. However, GPs used other forms of treatment more frequently to manage new cases (42.2 per 100 problems), especially providing advice on smoking, treatment and exercise. Pathology tests were more common in newly diagnosed peripheral vascular disease (28.9 per 100 problems) than in problems overall and covered a wide range of tests. Imaging was requested at a rate of 11.1 per 100 problems, involving mainly Doppler tests. Referral of new cases was common (42.2 per 100 problems) and was made principally for Doppler testing and to vascular surgeons.

Patients

	Per cent
Male	62.7
Female	37.3
Age	
<1–14	0.6
15–24	1.6
25–44	7.3
45–64	20.4
65–74	34.5
75+	35.6
Origin	
NESB	13.6
A&TSI	0.7

Reasons for encounter

	All	New
	n 402	n 95
	Rate[(a)]	
PVD	26.3	13.3
Leg/thigh complaint	21.6	48.1
Prescription all*	14.9	13.3
Test results*	7.4	7.2
Cardiac check-up*	6.4	7.2
Foot & toe complaint	5.0	4.6
General check-up*	4.7	0.0
Hypertension*	4.2	12.0
Chronic ulcer skin	4.2	1.2
Pain, chest NOS	3.5	8.6

Other problems managed

	All	New
	n 265	n 72
	Rate[(a)]	
Hypertension*	14.1	26.9
Diabetes*	9.8	6.7
Lipid disorder	7.4	12.6
IHD without angina	4.1	3.2
COPD	4.0	0.0
Immunisation all*	3.7	6.4
Anxiety*	3.5	10.7
Musculoskeletal disease	3.2	6.3
Osteoarthritis*	2.7	1.8
Gout	2.5	0.0

Medications

	All	New
	n 101	n 16
	Rate[(b)]	
Aspirin	11.6	1.4
Warfarin sodium	7.6	1.2
Nifedipine	6.3	11.4
Paracetamol/Codeine	3.2	2.2
Paracetamol	2.7	8.1
Frusemide	1.4	0.0
Simvastatin	1.1	0.0
Dextropropox/Paraceta	1.1	2.0
Cephalexin	1.1	0.0
Quinine sulphate	1.0	5.0

PERIPHERAL VASCULAR DISEASE

N = 215

(0.1% of all problems managed)

New problems = 45**

(20.9% of all peripheral vascular disease problems)

Other treatments

	All	New
	n 66	n 19
	Rate[(b)]	
Advice treatment	7.5	10.6
Advice smoking	4.9	12.9
Dressing/pressure	2.7	0.0
Advice nutrition/weight	2.5	3.1
Advice exercise	2.2	7.7
Counselling — problem	2.1	2.0
Advice/education	2.1	2.9
Advice medication	1.3	1.2
Excision tissue/biopsy	0.9	0.0
Observe/wait	0.8	0.0

Pathology

	All	New
	n 34	n 13
	Rate[(b)]	
Coagulation	4.9	1.2
Lipids	2.9	2.8
Full blood count	1.5	6.6
Other test NEC	1.2	0.0
EUC	1.1	5.2
Thyroid function	0.9	3.4
Glucose tolerance	0.8	2.2
Blood test	0.7	0.0
Calcium/phosphate	0.7	3.4
B12	0.4	1.8

Imaging

	All	New
	n 14	n 5
	Rate[(b)]	
Doppler	3.4	5.8
Imaging other	1.2	0.0
US/CT/contr; vascular	0.7	0.0
MRI	0.5	2.2
US/CT/contrast	0.3	1.4

Referrals

	All	New
	n 44	n 19
	Rate[(b)]	
Vascular surgeon	7.0	8.9
Surgeon	2.8	4.0
Doppler test	2.8	12.8
Hospital admission	2.6	2.2
Physician	1.5	3.5
Cardiologist	1.3	6.4
Specialist	1.2	1.6
Cardiothoracic surgeon	0.6	0.0
Ophthalmologist	0.4	2.0
ECG	0.1	0.0

(a) Rate per 100 peripheral vascular disease encounters.

(b) Rate per 100 peripheral vascular disease problems.

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 2).

** The number of encounters for new problems is low so results should be interpreted with caution as they may be unreliable.

Figure 14: Peripheral vascular disease

Appendix 1: BEACH survey data form

BEACH (Bettering the Evaluation And Care of Health) -Morbidity and Treatment Survey -National National

DOCID:

Date of encounter	Date of Birth	Sex	Patient status	Patient Postcode
___/___/___	___/___/___	M ☐ F ☐	New ☐ Old ☐	

NESB?	Aboriginal?	Torres Strait Islander?
Yes ☐ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Encounter Number:

Patient Reasons for Encounter (up to three)	HCC Status	Veterans Affairs
1.	Yes ☐	Gold card ☐
2.	No ☐	White card ☐
3.		

PATIENT SEEN
Item no. ☐
W/C paid ☐
Other paid ☐
No charge ☐

PATIENT NOT SEEN
Script..... ☐
Referral..... ☐
Certificate..... ☐
Other..... ☐

1. Diagnosis/problem — Work Related ☐ — **Problem status** New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	No. Rpts	? OTC	GP Supply	Drug status New	Drug status Cont.
1.							
2.							
3.							
4.							

Procedures, other treatment, counselling

New referrals, admissions

2. Diagnosis/problem — Work Related ☐ — **Problem status** New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	No. Rpts	? OTC	GP Supply	Drug status New	Drug status Cont.
1.							
2.							
3.							
4.							

Procedures, other treatment, counselling

New referrals, admissions

3. Diagnosis/problem — Work Related ☐ — **Problem status** New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	No. Rpts	? OTC	GP Supply	Drug status New	Drug status Cont.
1.							
2.							
3.							
4.							

Procedures, other treatment, counselling

New referrals, admissions

4. Diagnosis/problem — Work Related ☐ — **Problem status** New ☐ Old ☐

Medications for this problem: (up to four)

	Strength	Regimen	No. Rpts	? OTC	GP Supply	Drug status New	Drug status Cont.
1.							
2.							
3.							
4.							

Procedures, other treatment, counselling

New referrals, admissions

Pathology for problem(s)

1 ..... 1 2 3 4
2 ..... 1 2 3 4
3 ..... 1 2 3 4
4 ..... 1 2 3 4
5 ..... 1 2 3 4

Test/Body Site for problem(s)

Plain X-ray 1 2 3 4 .....
US/CT/Contrast 1 2 3 4 .....
Other Imaging 1 2 3 4 .....

To the patient:
In general would you say your health is:

Excellent..... ☐
Very good... ☐
Good..... ☐
Fair..... ☐
Poor..... ☐

Patient's
Height: ____ cm
Weight: ____ kg

To the patient if 18+:
How often do you have a drink containing alcohol?

Never ☐ 2-4 times a week ☐
Monthly ☐ 5+ times a week ☐
Once a week ☐

How many standard drinks do you have on a typical day when you are drinking? ____

How often do you have 6 or more standard drinks on one occasion?

Never..... ☐
Monthly or less..... ☐
Once a week..... ☐
2-4 times a week... ☐
5+ times a week.... ☐

BOTA

Appendix 2: Reasons for encounter and problems managed

Table A1: Reasons for encounter and problems managed—code groups from ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Abnormal test results	A91		Abnormal results investigations NOS
	B84		Abnormal white cells
	U98		Abnormal urine test NOS
	X86		Abnormal Pap smear
Anxiety	P01		Feeling anxious/nervous/tense
	P74		Anxiety disorder/anxiety state
Back complaint	L02		Back symptom/complaint
	L03		Low back symptom/complaint
	L86		Back syndrome with radiating pain
Check-up–ICPC chapter	A30, A31		General
	B30, B31		Blood
	D30, D31		Digestive
	F30, F31		Eye
	H30, H31		Ear
	K30, K31		Cardiovascular
	L30, L31		Musculoskeletal
	N30, N31		Neurological
	P30, P31		Psychological
	R30, R31		Respiratory
	S30, S31		Skin
	T30, T31		Endocrine
	U30, U31		Urology
	W30, W31		Prenatal/postnatal
	X30, X31, X37		Female genital
	Y30, Y31		Male genital
	Z30, Z31		Social
Depression	P03		Feeling depressed
	P76		Depressive disorder
Diabetes	T89		Diabetes, insulin dependent
	T90		Diabetes, non-insulin dependent
	W85		Gestational diabetes

(continued)

Table A1 (continued): Reasons for encounter and problems managed—code groups from ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Hypertension/High BP (for RFEs)	K85		Elevated blood pressure without hypertension
	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
	W81003		Hypertension in pregnancy
Hypertension (for problems)	K86		Uncomplicated hypertension
	K87		Hypertension with involvement of target organs
	W81003		Hypertension in pregnancy
Immunisation	A44		Preventive immunisation/medication–general/unspecified
	D44		Preventive immunisation/medication–hepatitis
	N44		Preventive immunisation/medication–tetanus
	R44		Preventive immunisation/medication–influenza
Ischaemic heart disease	K74		Ischaemic heart disease without angina
	K76		Ischaemic heart disease with angina
Osteoarthritis		L83011	Osteoarthritis spine cervical
		L84004	Osteoarthritis spine
		L84009	Osteoarthritis spine thoracic
		L84010	Osteoarthritis spine lumbar
		L84011	Osteoarthritis lumbosacral
		L84012	Osteoarthritis sacroiliac
		L89001	Osteoarthritis hip
		L90001	Osteoarthritis knee
		L91001	Osteoarthritis degenerative
		L91003	Osteoarthritis
		L92007	Osteoarthritis shoulder
Overweight and obesity	T82		Overweight
	T83		Obesity
Oral contraception	W10		Contraception, postcoital
	W11		Oral contraceptive
	W50		Medication (reproductive system)
Prescription	-50		Medication prescription/request/ renewal/injection
Rash	S06		Localised redness/erythema/rash of skin
	S07		Generalised/multiple redness/erythema/rash of skin

(continued)

Table A1 (continued): Reasons for encounter and problems managed—code groups from ICPC-2 PLUS

Group	ICPC rubric	ICPC-2 PLUS code	ICPC/ICPC-2 PLUS label
Sprain/strain		L19014	Strain muscle(s)
	L77		Sprains and strains of ankle(s)
	L78		Sprains and strains of knee(s)
	L79		Sprains and strains of other joint
		L83023	Sprain neck
		L83024	Strain neck
		L84020	Strain back
		L84021	Sprain back
Swelling	S04		Localised swelling/papules/ lump/mass/skin/subcutaneous tissue
	S05		Generalised swelling/papules/ lumps/mass/skin/subcutaneous tissue
Test results	-60		Results test/procedures
	-61		Results examinations/test/record/letter from other provider
Urinary tract infection (UTI)	U70		Pyelonephritis/pyelitis, acute
	U71		Cystitis/other urinary infection, non-venereal

Appendix 3: Non-pharmacological treatment

Table A2: Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
Clinical	Advice–care of other person	A45022	Advice;care of sick 3rd person
		A45023	Advice;care of well 3rd person
		A58001	Counselling;terminal care
	Advice/education	A45002	Advice/education
		B45002	Advice/education;blood
		D45002	Advice/education;digestive
		F45002	Advice/education;eye
		H45002	Advice/education;ear
		K45002	Advice/education;cardiovascular
		L45002	Advice/education;musculoskeletal
		N45002	Advice/education;neurological
		P45001	Advice/education;psychological
		R45002	Advice/education;respiratory
		S45002	Advice/education;skin
		T45002	Advice/education;endocrine/metabolic
		U45002	Advice/education;urology
		W45004	Advice/education;reproductive
		X45002	Advice/education;genital;Female
		Y45002	Advice/education;genital;Male
		Z45002	Advice/education;social
	Advice/education–legal/other	A45017	Advice/education;compensation
		Z45009	Advice/education;legal
	Advice/education–medication	A45015	Advice/education;medication
		A48003	Review;medication
		A48005	Increased;drug dosage
		A48006	Decreased;drug dosage
		A48007	Change (in);drug dosage
		A48008	Stop medication
		A48009	Recommend medication (not new)
		A48010	Change (in);medication
	Advice/education–mothercare	A45024	Advice;mothercare

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Advice/education–treatment	A45016	Advice/education;treatment
		A45019	Advice;time off work
		A45020	Advice;order rest/RIB
		A45021	Advice;naturopathic treatment
		A48004	Review;treatment
		S45004	Advice/education;RICE
		T45004	Advice/education;diabetes
	Consultation with primary care provider	A46001	Consult;other GP/AHP
		A46002	Consult;nursing
		B46001	Consult;other GP/AHP;blood/blood forming
		K46001	Consult;other GP/AHP;cardiovascular
		L46001	Consult;other GP/AHP;musculoskeletal
		P46001	Consult;other GP/AHP;psychological
		U46001	Consult;other GP/AHP;urology
		Z46001	Consult;other GP/AHP;social
	Consultation with specialist	A47001	Consult;specialist
		F47002	Consult;ophthalmologist
		K47002	Consult;cardiologist
		L47002	Consult;orthopaedic surgeon
		L47003	Consult;rheumatologist
		N47002	Consult;neurologist
		P47003	Consult;psychiatrist
		S47002	Consult;dermatologist
		T47002	Consult;endocrinologist
		U47001	Consult;specialist;urology
		W47002	Consult;obstetrician/gynaecologist
	Counsel/advice–STDs	A45012	Advice/education;STD
		A58008	Counselling;STDs
		X58004	Counselling;STDs;Female
		Y58004	Counselling;STDs;Male
	Counsel/advice–alcohol	P45005	Advice/education;alcohol
		P58009	Counselling;alcohol
	Counsel/advice–drug abuse	P45006	Advice/education;illicit drugs
		P58010	Counselling;drug abuse
	Counsel/advice–exercise	A45004	Advice/education;exercise
		A58005	Counselling;exercise

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Counsel/advice–health/body	A45005	Advice/education;health
		A45010	Information;health
		A45018	Advice/education;body
		A58006	Counselling;health
	Counsel/advice–lifestyle	P45008	Advice/education;lifestyle
		P58012	Counselling;lifestyle
	Counsel/advice–nutrition/weight	A45006	Advice/education;diet
		T45005	Advice/education;nutritional
		T45007	Advice/education;weight mgt
		T58002	Counselling;weight management
	Counsel/advice–occupational	Z45004	Advice/education;occupation
		Z45010	Advice/education;work practice
		Z58004	Counselling;occupational
	Counsel/advice–other	A45014	Advice/education;travel
		P45009	Advice/education;sexuality
		P45010	Advice/education;life stage
		P58016	Counselling;life stage
		Z58005	Counselling;environment
	Counsel/advice–pregnancy	W58004	Counselling;prenatal
		W58006	Counselling;problem;pregnancy
	Counsel/advice–prevention	A45025	Advice/education;immunisation
		A58007	Counselling;prevention
		X45004	Advice/educat;breast self exam
		Z45005	Advice/education;environment
	Counsel/advice–relationship	Z45006	Advice/education;parenting
		Z45007	Advice/education;mothering
		Z58001	Counselling;conjugal(partner)
		Z58003	Counselling;marriage/rship
		Z58006	Counselling;parenting
		Z58007	Counselling;mothering
		Z58009	Counselling;family
	Counsel/advice–relaxation	P45007	Advice/education;relaxation
		P58011	Counselling;relaxation
		P58017	Counselling;stress management
	Counsel/advice–smoking	P45004	Advice/education;smoking
		P58008	Counselling;smoking

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Counselling–problem	A58002	Counselling;problem
		A58003	Counselling;individual
		B58001	Counselling;problem;blood/blood forming
		D58001	Counselling;problem;digestive
		F58001	Counselling;problem;eye
		H58001	Counselling;problem;ear
		K58001	Counselling;problem;cardiovascular
		L58001	Counselling;problem;musculoskeletal
		N58001	Counselling;problem;neurological
		R58001	Counselling;problem;respiratory
		S58001	Counselling;problem;skin
		T58001	Counselling;problem;endocrine/metabolic
		U58001	Counselling;problem;urology
		W58003	Counselling;problem;reproductive
		X58001	Counselling;problem;genital;Female
		X58003	Counselling;sexual;physical;Female
		Y58001	Counselling;problem;genital;Male
		Y58003	Counselling;sexual;physical;Male
		Z58002	Counselling;problem;social
	Counselling–psychological	P58001	Counselling;psychiatric
		P58002	Psychotherapy
		P58004	Counselling;psychological
		P58005	Counselling;sexual;psychological
		P58006	Counselling;individual;psychological
		P58007	Counselling;bereavement
		P58013	Counselling;anger
		P58014	Counselling;self-esteem
		P58015	Counselling;assertiveness
	Family planning	W14015	Counselling;genetic;Female
		W45006	Advice/education;preconceptual
		W45007	Advice/education;contraception
		W45008	Advice/education;family plan;Female
		W58001	Counselling;abortion
		W58005	Counselling;terminat pregnancy
		W58007	Counselling;preconceptual
		W58012	Counselling;sterilisation;Female

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		W58013	Counselling;family planning;Female
		Y14006	Counselling;genetic;Male
		Y58005	Counselling;sterilisation;Male
		Y58006	Counselling;family planning;Male
	Observe/wait	A45001	Observe/wait
		B45001	Observe/wait;blood/blood forming organs
		D45001	Observe/wait;digestive
		F45001	Observe/wait;eye
		H45001	Observe/wait;ear
		K45001	Observe/wait;cardiovascular
		L45001	Observe/wait;musculoskeletal
		N45001	Observe/wait;neurological
		P45002	Observe/wait;psychological
		R45001	Observe/wait;respiratory
		S45001	Observe/wait;skin
		T45001	Observe/wait;endocrine/metabolic
		U45001	Observe/wait;urology
		W45003	Observe/wait;reproductive
		X45001	Observe/wait;genital;Female
		Y45001	Observe/wait;genital;Male
		Z45001	Observe/wait;social
	Other admin/document	A62001	Administrative
		A62002	Admin;certificate
		A62003	Admin;document
		A62004	Admin;application
		A62005	Admin;legal report
		A62006	Admin;workers compensation report
		A62007	Admin;certificate;death
		A62009	Admin;travel
		H62001	Administrative;ear
		L62001	Administrative;musculoskeletal
		L62002	Order/supply;physical aids
		P62001	Administrative;psychological
		R62001	Administrative;respiratory
		S62001	Administrative;skin
		T62001	Administrative;endocrine/metabolic

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		W62001	Administrative;reproductive
		Z62001	Administrative;social
		Z62002	Certificate(s);social
		Z62003	Admin;social security
	Other treatment code NEC	R48002	Discuss;pt RFE;respiratory
	Reassurance support	A58010	Reassurance/support
	Sickness certificate	A62008	Admin;certificate;sickness
Procedural	Assist at operation	A69006	Assist at operation
		D69002	Assist at operation;digestive
		L69002	Assist at operation;musculoske
		S69002	Assist at operation;skin
		U69002	Assist at operation;urological
		Y69002	Assist at operation;genital;Male
	Contraceptive device fit/supply/remove	W12005	IUCD;removal
	Diagnostic endoscopy	A40001	Endoscopy
		A40002	Laparoscopy
		D40001	Gastroscopy
		D40002	Proctoscopy
		D40003	Rectoscopy
		D40004	Colonoscopy
		D40007	Sigmoidoscopy
		D40009	Endoscopy;diagnostic;digestive
		L40006	Arthroscopy;knee
		R40001	Bronchoscopy
		R40002	Laryngoscopy;direct
		R40005	Laryngoscopy;indirect
		X40001	Colposcopy
	Diagnostic radiology/imaging	K41001	Echocardiography
	Dressing/pressure/compression/ tamponade	A56001	Dressing
		A56002	Compression
		B56002	Compression;blood
		F56002	Compression;eye
		H56001	Packing;ear
		K56001	Reduction (of);haemorrhoids
		K56002	Reduction (of);piles
		K56003	Support;varicose veins

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		K56004	Jobst stockings;varicose vein
		K56005	Jobst stockings;lymphadena
		K56007	Compression;cardiovascular
		L56002	Compression;musculoskeletal
		L56003	Bandage/strap
		R56007	Nasal packing (for) epistaxis
		S56001	Dressing;skin
		S56003	Dressing;burn
		S56004	Dressing;wound
		S56005	Ice pack
		U56003	Incontinence pads
	Electrical tracings	K42002	Electrocardiogram
		K42004	Electrocardiogram;exercise
		K42005	Holter monitor
		K42009	Vectocardiogram
		K42010	Electrocardiogram;stress test
		N42001	Electroencephalogram
		W42001	Monitoring;foetal
	Excision/removal tissue/biopsy/ destruction/debridement/ cauterisation	A52001	Excision
		A52002	Remove
		A52004	Cauterise
		A52007	Removal;foreign body
		B52001	Excision;blood
		B52002	Remove;blood
		B52004	Cauterise;blood
		D52001	Excision;digestive
		D52002	Remove;digestive
		D52005	Cholecystectomy
		D52013	Whipples procedure
		D52015	Appendicectomy
		D52017	Removal;foreign body;mouth
		F52001	Excision;eye
		F52002	Remove;eye
		F52009	Removal;foreign body;eye

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		H52001	Excision;ear
		H52002	Remove;ear
		H52006	Removal;foreign body;ear
		K52001	Excision;cardiovascular
		K52007	Stripping;varicose vein
		L52001	Excision;musculoskeletal
		L52008	Excision;neoplasm;soft tissue
		N52001	Excision;neurological
		R52002	Remove;respiratory
		R52005	Lobectomy
		R52007	Cauterise;nasal
		R52009	Removal;foreign body;nasal
		S52002	Excision;scar tissue
		S52003	Removal;wart
		S52004	Excision;lesions;superficial
		S52006	Debridement;wound
		S52007	Removal;foreign body;skin
		S52008	Excision;skin
		S52009	Remove;skin
		S52011	Cauterise;skin
		S52012	Excision;neoplasm/cyst;benign
		S52013	Debridement;burn
		S52014	Cryotherapy
		S52015	Electrocautery/diathermy
		S52017	Laser treatment
		S52018	Excision;neoplasm;malignant
		S52019	Excision;mole
		S52020	Excision/debride;plantar wart
		S52022	Resection;ingrown toenail(s)
		S52023	Cautery;chemical
		S52024	Removal;foreign body;nail
		S52025	Biopsy;skin
		S52026	Removal;toenail(s)
		S52027	Removal;fingernail(s)
		S52028	Resection;ingrown fingernail(s
		S52029	Curettage;skin/wound

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		S52030	Excision;cyst;skin
		W52010	Dilatation and curettage
		X52001	Biopsy;endometrial
		X52002	Excision;genital;Female
		X52005	Cauterise;genital;Female
		X52008	Polypectomy;cervical
		X52017	Oophorectomy;unilateral
		X52021	Removal;foreign body;vagina
		Y52001	Procedure;circumcision;Male
		Y52006	Excision;cyst;epididymal
		Y52007	Vasectomy
	Incise/drainage/flushing/aspiration/ removal body fluid	A51001	Incise;body fluids
		A51002	Drain;body fluids
		A51003	Aspirate;body fluids
		A51005	Venesection
		B51001	Incise;body fluids;blood
		B51002	Drain;body fluids;blood
		D51003	Drain;body fluids;digestive
		D51004	Aspirate;body fluids;digestive
		F51001	Eye;washing
		F51003	Incise;body fluids;eye
		F51004	Drain;body fluids;eye
		H51001	Clean ear
		H51002	Removal;wax;ear
		H51004	Syringe ear;for wax
		H51007	Drain;body fluids;ear
		H51009	Syringe ear
		K51002	Incise;haemorrhoid
		L51001	Aspiration;bursa
		L51002	Aspiration;joint(s)
		L51006	Incise;body fluids;musculoskeletal
		L51007	Drain;body fluids;musculoskeletal
		L51008	Aspirate;body fluids;musculoskeletal
		L51009	Aspiration;cyst;musculoskeletal
		N51002	Lumbar puncture
		R51003	Drain;body fluids;respiratory

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		S51001	Incise;haematoma;skin
		S51003	Incise/drain;abscess;skin
		S51004	Aspiration;abscess;skin
		S51007	Incise;body fluids;skin
		S51008	Drain;body fluids;skin
		S51009	Aspirate;body fluids;skin
		S51010	Incise/drain;cyst;skin
		T51001	Implant;oestrogen
		T51006	Implant;testosterone
		X51004	Aspiration;cyst;breast
		D53002	Dilate;digestive
		D53003	Enema
		H53004	Drainage tube(s);middle ear
		K53007	Stent(s);carotid
		U53001	Dilate;urethral
		U53002	Insertion;catheter;urinary
		U53006	Removal;catheter;urinary
		U53007	Catheterise;urology
		U53009	Insertion;catheter;suprapubic
		U53010	Removal;catheter;suprapubic
		U53012	Care (of);catheter
		Y53001	Catheterise;genital;Male
	Local injection/infiltration	A55001	Infiltrate
		A55002	Local anaesthetic
		K55001	Injection;varicose vein
		L55001	Injection;bursa
		L55002	Injection;joint(s)
		L55003	Injection;tendon(s)
		L55008	Injection;trigger point;muscul
		L55011	Injection;intra-articular
		N55001	Block;nerve
		N55002	Injection;nerve(s)
		N55003	Injection;trigger point;neurological
		N55004	Injection;local;CNS
		S55001	Injection;lesions/cysts;skin
		S55002	Infiltrate;skin
		T55002	IV fluids/infusion

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Other diagnostic procedures	B43001	Procedures;diagnostic;blood
		D43002	Procedures;diagnostic;digestive
		F43001	Procedures;diagnostic;eye
		H43001	Procedures;diagnostic;ear
		K43003	Test;Doppler
		L43002	Procedures;diagnostic;musculoskeletal
		L43003	Test;bone marrow density
		P43001	Test;psychological
		S43001	Procedures;diagnostic;skin
		U43002	Procedures;diagnostic;urology
		X43001	Procedures;diagnostic;genital;Female
	Other preventive procedures/high risk medication condition	A49004	Preventive procedure
		L49001	Preventive procedure;musculoskeletal
		N49001	Preventive procedure;neurolog
		S49001	Preventive procedure;skin
		U49001	Preventive procedure;urology
	Other therapeutic procedures/surgery NEC	A59001	Therapeutic proced
		A59002	Acupuncture
		A59003	Personal care
		A59004	Oxygen
		B59002	Blood transfusion
		D59002	Therapeutic proced;digestive
		D59009	Care (of);colostomy
		F59001	Therapeutic proced;eye
		H59001	Piercing;ear
		H59002	Therapeutic proced;ear
		L59001	Therapeutic proced;musculo
		L59002	Carpal tunnel release
		P59003	Hypnosis/hypnotherapy
		P59005	Therapy;relaxation
		R59001	Therapeutic proced;respiratory
		R59003	Steam inhalation
		S59001	Therapeutic proced;skin
		S59002	Podiatry
		T59001	Therapeutic proced;endo/metab
		U59001	Dialysis;kidney (renal)
		U59003	Therapeutic proced;urology

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		X59001	Therapeutic proced;genital;Female
		Y59001	Therapeutic proced;genital;Male
	Other treatment code NEC	D33008	Test;faeces MC&S
		R69002	Assist at operation;respirator
		T34006	Test;cholesterol
		U41001	Pyelogram;intravenous
		W14010	Contraception;diaphragm
		W69002	Assist at operation;reproduct
		X41001	Mammography;Female
	Pap smear	X37001	Pap smear
	Physical function test	A39001	Test;physical function
		F39003	Schiotz tonometry
		F39005	Test;vision
		F39006	Test;visual field
		F39013	Test;physical function;eye
		H39001	Test;audiometry
		H39003	Test;hearing
		H39007	Test;tympanometry
		H39008	Test;physical function;ear
		N39001	Test;physical function;neuro
		R39002	Test;peak flow
		R39003	Test;pulmonary function
		R39004	Test;spirometry
		R39005	Test;lung function
		R39007	Test;physical function;respira
	Physical medicine/rehabilitation	A57001	Rehab;physical
		A57002	Radiotherapy
		A57003	Therapy;physical
		A57004	Massage
		A57005	Home assessment
		K57001	Rehab;physical;cardiovascular
		L57001	Joint;manipulation
		L57002	Rehab;physical;musculo
		L57003	Therapy;ultrasound;musculoskeletal
		L57004	Therapy;short wave;musculoskeletal
		L57005	Physiotherapy

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		L57006	Therapy;heat
		L57007	Hydrotherapy
		L57008	Therapy;microwave;musculoskeletal
		L57009	Electrical stimulation
		L57010	Therapeutic exercises
		R57001	Therapy;respiratory
		X57001	Rehab;physical;genital;Female
		Y57001	Massage;prostatic
	Pregnancy test	W33001	Test;urine;pregnancy
		W33002	Test;pregnancy
	Repair/fixation-suture/cast/prosthetic device (apply/remove)	D54002	Hernia;support truss
		D54007	Surgery/extraction;dental
		D54010	Repair;hernia;inguinal
		F54001	Fitting (of);glasses
		F54002	Fitting (of);contact lens
		H54001	Adjusting;hearing aid
		K54009	Repair/replace;valve;mitral
		L54001	Adjusting;brace;back
		L54004	Cast (for);fracture
		L54005	Cast (for);removal
		L54009	Application;support;neck
		L54011	Application;collar;cervical
		L54014	Plaster (for);fracture
		L54017	Splint/immobilise;joint(s)
		L54018	Fixation/support;tendon(s)
		L54019	Strapping;sprains/strains
		L54022	Fitting (of);brace;back
		L54023	Fitting (of);brace;leg
		L54033	Replace;joint;hip
		L54034	Sling
		L54038	Osteotomy
		L54039	Adjusting;brace;leg
		L54040	Plaster;removal (of)
		L54041	Plaster;repair (of)
		L54042	Cast (for);repair/alter
		L54043	Plaster (for);sprain
		L54044	Plaster (for);strain

(continued)

Table A2 (continued): Non-pharmacological treatment—code groups from ICPC-2 PLUS

Treatment type	Treatment group	ICPC-2 PLUS code	ICPC-2 PLUS label
		L54045	Splint/immobilise;fracture
		L54046	Splint/immobilise;removal
		L54047	Splint/immobilise;repair (of)
		L54048	Splint/immobilise;sprain
		L54049	Splint/immobilise;strain
		L54060	Treat;fract/disloc;humerus
		L54070	Treat;fract/disloc;pelvis
		L54072	Treat;fract/disloc;radioulnar
		L54073	Treat;fract/disloc;radius
		L54077	Treat;fract/disloc;shoulder
		L54089	Replace;joint;shoulder
		L54097	Treat;fract/disloc
		N54006	Clipping;aneurysm;intracranial
		S54001	Repair;laceration;skin
		S54002	Suture;laceration;skin
		S54004	Repair;skin
		S54006	Removal;suture(s)
		S54008	Repair;wound;skin
		W54010	Episiotomy;repair
		X54001	Insertion;pessary
		Y54002	Fixate;genital;Male
	Sensitivity test	A32001	Test;sensitivity
	Sensitivity test	D32001	Test;sensitivity;digestive
	Sensitivity test	R32001	Test;Mantoux
		S32001	Test;sensitivity;skin
	Test; glucose	T34005	Test;glucose
	Urine test	A35001	Test;urine
		A35002	Urinalysis
		B35001	Test;urine;blood
		T35001	Test;urine;endocrine/metabolic
		W35001	Test;urine;reproductive

Appendix 4: Referrals

Table A3: Referrals—code groups from ICPC-2 PLUS

Referral group	ICPC-2 PLUS code	ICPC-2 PLUS label
Allied health services	all component '66'	Referral to other provider/nurse/therapist/social worker
	component '68', excluding A68009	Other referrals NEC
	Z67002	Referral;respite care
Specialist	component '67', excluding A67011, A67010, P67005 and Z67002	Referral to physician/specialist/clinic/hospital
	A68009	Referral;oncologist
Emergency department	A67011	Referral;Emergency (Hospital)
Hospital	A67010	Referral;hospital
	P67005	Referral;hospital;psychiatrist

Appendix 5: Pathology tests

Table A4: Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
Chemistry	Amylase	D34004	Test;amylase
	B12	B34015	Test;B12
		D34009	Test;Schillings
	C reactive protein	A34005	Test;C reactive protein
	Calcium/phosphate	A34006	Test;calcium
		A34013	Test;phosphate
	Cardiac enzymes	D34005	Test;asparate aminotransferase
		K34003	Test;cardiac enzymes
		K34004	Test;creatine kinase
	Chemistry; other	A34015	Test;protein
		A34018	Vitamin assay
		B34023	Test;transferrin
		D34002	Test;alanine aminotransferase
		K34001	Test;blood;digitalis
		N34001	Test;blood;phenylhydantoin
		P34003	Test;methadone
	Digoxin	A34002	Drug assay
		K34005	Test;digoxin
		N34003	Test;phenytoin
		P34002	Test;lithium
	Drug screen	A35003	Drug screen
	EUC	A34007	Test;chloride
		A34008	Test;electrolytes
		A34010	Test;EUC
		A34014	Test;potassium
		A34017	Test;sodium
		U34002	Test;creatinine
		U34003	Test;urea
	Ferritin	B34016	Test;ferritin
		B34019	Tests;iron studies
	Folic acid	B34017	Test;folic acid
	Glucose tolerance	T34005	Test;glucose
		T34009	Test;glucose tolerance

(continued)

Table A4 (continued): Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	HbA1c	T34010	Test;HbA1c
	Hormone assay	A34003	Hormone assay
		T34007	Test;cortisol
	Lipids	T34001	Check-up;cholesterol
		T34004	Test;lipids profile
		T34006	Test;cholesterol
		T34011	Test;cholesterol HDL
		T34013	Test;cholesterol LDL
		T34016	Test;triglycerides
	Liver function	A34004	Test;albumin
		D34003	Test;alkaline phosphatase
		D34006	Test;bilirubin
		D34007	Test;gGT
		D34008	Test;liver function
		T34012	Test;LDH
	Multibiochemical analysis	A34012	Test;mult biochemical analysis
	Prostate specific antigen	Y34002	Test;acid phosphatase
		Y34003	Test;prostate specific antigen
	Thyroid function	T34015	Test;thyroid function
	Urate/uric acid	U34004	Test;urate/uric acid
Cytopathology	Cytology; other	A37002	Test;cytology
		B37003	Test;cytology;blood
		D37002	Test;cytology;digestive
		F37002	Test;cytology;eye
		H37002	Test;cytology;ear
		K37002	Test;cytology;cardiovascular
		L37002	Test;cytology;musculoskeletal
		N37002	Test;cytology;neurological
		R37002	Test;cytology;respiratory
		R37003	Test;sputum cytology
		S37002	Test;cytology;skin
		T37002	Test;cytology;endocr/metabol
		U37002	Test;cytology;urology
		W37002	Test;cytology;reproduction
		Y37002	Test;cytology;genital;Male

(continued)

Table A4 (continued): Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Pap smear	X37001	Pap smear
		X37003	Test;cytology;genital;Female
Haematology	Blood grouping & typing	B33001	Test;Coombs
		B33002	Test;blood grouping & typing
	Blood; other	B33003	RH;antibody titer
		B34005	Test;blood;platelets
		B34007	Test;blood;sickle cell
		B34021	Test;reticulocyte count
		B37001	Exam;bone marrow
	Coagulation	B34002	Test;blood;coagulation/bleed
		B34003	Test;blood;coagulation time
		B34006	Test;part thromboplastin time
		B34008	Test;bleeding/coagulation time
		B34009	Test;prothrombin time
		B34014	Test;APTT
		B34022	Test;thrombin time
	ESR	A34009	Test;ESR
	Full blood count	A34011	Test;full blood count
	Haemoglobin	B34018	Test;haemoglobin
Histopathology	Histology; other	A37001	Test;histology
		B37002	Test;histology;blood
		D37001	Test;histology;digestive
		F37001	Test;histology;eye
		H37001	Test;histology;ear
		K37001	Test;histology;cardiovascular
		L37001	Test;histology;musculoskeletal
		N37001	Test;histology;neurological
		R37001	Test;histology;respiratory
		T37001	Test;histology;endoc/metabol
		U37001	Test;histology;urology
		W37001	Test;histology;reproductive
		X37002	Test;histology;genital;Female
		Y37001	Test;histology;genital;Male
	Histology; skin	S37001	Test;histology;skin
Immunology	Anti nuclear antibodies	L33004	Test;anti nuclear antibodies
	Immunology; other	A32001	Test;sensitivity

(continued)

Table A4 (continued): Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
		A33005	Test;immunology
		B33005	Test;immunology;blood
		B33007	Test;immunoglobulins
		D32001	Test;sensitivity;digestive
		D33004	Test;immunology;digestive
		H33002	Test;immunology;ear
		K33002	Test;immunology;cardiovascular
		L33003	Test;immunology;musculoskeletal
		L34001	Test;lupus erythemat;cell prep
		N33002	Test;immunology;neurological
		R32004	Test;sensitivity;respiratory
		R33004	Test;immunology;respiratory
		S32001	Test;sensitivity;skin
		S33002	Test;immunology;skin
		S33004	Test;skin patch
		T33002	Test;immunology;endocrine/ metabolic
		U33003	Test;immunology;urology
		W33007	Test;immunology;reproductive
		X33002	Test;immunology;genital;Female
		Y33002	Test;immunology;genital;Male
	RAST	A34016	Test;RAST
	Rheumatoid factor	L33001	Test;rheumatoid factor
Infertiliity/pregnancy test	Infertility/pregnancy	W33001	Test;urine;pregnancy
		W33002	Test;pregnancy
		W34002	Test;blood;pregnancy
		W34003	Test;antenatal
		Y38002	Test;sperm count
Microbiology	Antibody	A33003	Test;antibody
	Cervical swab	X33004	Test;cervical swab
	Chlamydia	A33006	Test;chlamydia
		X33006	Test;viral culture;genital;Female
	Ear swab and C&S	H33003	Test;ear swab and C&S
	Faeces MC&S	D33002	Stool(s);culture
		D33008	Test;faeces MC&S
		D36001	Test;faeces;cyst/ova/parasite
	Fungal ID/sensitivity	A33008	Test;fungal ID/sensitivity

(continued)

Table A4 (continued): Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	H pylori	D33009	Test;H Pylori
		D33005	Test;hepatitis A serology
		D33006	Test;hepatitis B serology
		D33007	Test;hepatitis C serology
		D33013	Test;hepatitis serology
	HIV	B33006	Test;HIV
	Microbiology; other	A33004	Test;microbiology
		A33007	Test;culture and sensitivity
		B33004	Test;microbiology;blood
		D33003	Test;microbiology;digestive
		D33010	Test;hepatitis D serology
		D33011	Test;hepatitis E serology
		D33012	Test;rotavirus
		F33001	Test;microbiology;eye
		H33001	Test;microbiology;ear
		K33001	Test;microbiology;cardiovascular
		L33002	Test;microbiology;musculoskeletal
		N33001	Test;microbiology;neurological
		R33001	Culture;tuberculosis
		R33002	Culture;throat
		R33003	Test;microbiology;respiratory
		S33001	Test;microbiology;skin
		T33001	Test;microbiology;endoc/metabolic
		U33002	Test;microbiology;urology
		W33006	Test;microbiology;reproductive
		X33001	Test;microbiology;genital;Female
		X33003	Culture;gonococcal;Female
		Y33001	Test;microbiology;genital;Male
		Y33003	Culture;gonococcal;Male
		Y33004	Test;viral culture;genital;Male
		Y33005	Test;urethral/penile swab
	Monospot	A33002	Test;monospot
	Nose swab C&S	R33008	Test;nose swab C&S
	Pertussis	R33007	Test;pertussis
	Ross River fever	A33009	Test;Ross River fever
	Rubella	A33001	Test;rubella

(continued)

Table A4 (continued): Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
	Skin swab C&S	S33003	Test;skin swab C&S
	Sputum C&S	R33005	Test;sputum MC&S
	Throat swab C&S	R33006	Test;throat swab C&S
	Urine MC&S	U33001	Test;culture;urine
		U33004	Test;urine MC&S
	Vaginal swab and C&S	X33005	Test;vaginal swab and C&S
	Venereal disease	A33010	Test;venereal disease
Other NEC	Blood test	A34001	Test;blood
	Other test NEC	A38001	Test;other lab
	Faeces test	A36001	Test;faeces
		A38002	Pathology
		B38001	Test;other lab;blood
		D34001	Test;blood;digestive
		D35001	Test;urine;digestive
		D36002	Test;faeces;digestive
		D38001	Test;other lab;digestive
		F34001	Test;blood;eye
		F38001	Test;other lab;eye
		H34001	Test;blood;ear
		H38001	Test;other lab;ear
		K34002	Test;blood;cardiovascular
		K38001	Test;other lab;cardiovascular
		L34003	Test;blood;musculoskeletal
		L38001	Test;other lab;musculoskeletal
		N34002	Test;blood;neurological
		N38001	Test;other lab;neurological
		P34001	Test;blood;psychological
		P35001	Test;urine;psychological
		P38001	Test;other lab;psychological
		R34001	Test;blood;respiratory
		R38001	Test;other lab;respiratory
		S34001	Test;blood;skin
		S38001	Test;other lab;skin
		T34002	Test;blood;endocr/metabolic
		T35001	Test;urine;endocrine/metabolic
		T38001	Test;other lab;endocr/metabol

(continued)

Table A4 (continued): Pathology tests—code groups from ICPC-2 PLUS

Main pathology group	Pathology sub-group	ICPC-2 PLUS code	ICPC-2 PLUS label
		U34001	Test;blood;urology
		U35002	Test;urine;urology
		U38001	Test;other lab;urology
		W34001	Test;blood;reproductive
		W35001	Test;urine;reproductive
		W38001	Test;other lab;reproductive
		X34001	Test;blood;genital;Female
		X35001	Test;urine;genital;Female
		X38001	Test;other lab;genital;Female
		Y34001	Test;blood;genital;Male
		Y35001	Test;urine;genital;Male
		Y38001	Test;other lab;genital;Male
		Z38001	Test;other lab;social
	Urinalysis	A35002	Urinalysis
	Urine test	A35001	Test;urine
	Simple test; other	B35001	Test;urine;blood
	Simple test; other	D36003	Test;occult blood
	Simple test; other	R32001	Test;Mantoux
	Simple test; other	R32002	Test;tuberculin

Appendix 6: Imaging tests

Table A5: Imaging tests—code groups from ICPC-2 PLUS

Imaging group	ICPC-2 PLUS code	ICPC-2 PLUS label
Plain	A41002	X-ray;chest
	A41006	X-ray;abdomen
	D41006	X-ray;oesophagus
	D41008	X-ray;digestive tract
	D41009	X-ray;mouth
	F41002	X-ray;eye
	H41002	X-ray;ear
	L41003	X-ray;bone(s)
	L41004	Plain X-ray;bone(s)
	L41013	X-ray;elbow
	L41014	X-ray;hand
	L41015	X-ray;wrist
	L41016	X-ray;knee
	L41017	X-ray;hip
	L41018	X-ray;neck
	L41019	X-ray;pelvis
	L41020	X-ray;shoulder
	L41021	X-ray;lumbosacral
	L41022	X-ray;cervical
	L41023	X-ray;thoracic
	L41024	X-ray;spinal
	L41025	X-ray;joint(s)
	L41026	X-ray;foot/feet
	L41027	X-ray;ankle
	L41028	X-ray;leg
	L41029	X-ray;ribs
	L41030	X-ray;face
	L41032	X-ray;arm
	N41004	X-ray;skull
	R41002	X-ray;sinus
	U41007	X-ray;urinary tract
	W41003	X-ray;uterus
	X41001	Mammography;Female
	X41002	Mammography;request;Female
	X41007	X-ray;breast;Female
Contrast/ultrasound/CT scan	A41003	Test;US/CT/contrast
	A41004	Test;US/CT/contrast;abdomen
	A41005	Test;US/CT/contrast;chest
	A41008	MRI

(continued)

Table A5 (continued): Imaging tests—code groups from ICPC-2 PLUS

Imaging group	ICPC-2 PLUS code	ICPC-2 PLUS label
	D41002	Test;US/CT/contrast;gallbladder
	D41004	Test;US/CT/contrast;oesophagus
	D41010	Test;US/CT/contrast;stomach/duodenum
	D41011	Test;US/CT/contrast;colon
	K41005	Angiography;coronary
	K41007	Angiography;cerebral
	K41008	Test;US/CT/contrast;vascular
	K41009	Test;US/CT/contrast;cardiac
	K41010	Test;US/CT/contrast;heart
	L41001	Arthrogram
	L41006	Test;US/CT/contrast;pelvis
	L41007	Test;US/CT/contrast;musculosk
	L41008	Test;US/CT/contrast;neck
	L41009	Test;US/CT/contrast;spine
	L41010	Test;US/CT/contrast;joint
	L41011	Test;US/CT/contrast;face
	L41012	Test;US/CT/contrast;extremity
	L41031	Test;US/CT/contrast;shoulder
	N41002	Test;US/CT/contrast;brain
	N41003	Test;US/CT/contrast;head
	T41002	Test;US/CT/contrast;endo/metab
	U41006	Test;US/CT/contrast;urin tract
	W41001	Test;US/CT/contrast;obstetric
	X41006	Test;US/CT/contrast;breast;Female
	X41008	Test;US/CT/contrast;genital;Female
	Y41002	Test;US/CT/contrast;prostate
	Y41003	Test;US/CT/contrast;scrotum
	Y41004	Test;US/CT/contrast;genital;Male
Other	A41007	Imaging other
	A41009	Nuclear medicine
	A41010	Radiology
	A41011	Isotope scan
	K41001	Echocardiography
	K41003	Cardiogram
	K42002	Electrocardiogram
	K42005	Holter monitor

(continued)

Table A5 (continued): Imaging tests—code groups from ICPC-2 PLUS

Imaging group	ICPC-2 PLUS code	ICPC-2 PLUS label
	K43003	Test;Doppler
	L40006	Arthroscopy;knee
	L41002	Scan;bone(s)
	L43003	Test;bone marrow density
	N41001	Radiology;diagnostic;neurolog
	U41001	Pyelogram;intravenous

Appendix 7: Coding Atlas for Pharmaceutical Substances Classification

Table A6: Coding Atlas for Pharmaceutical Substances (CAPS) Classification

Drug group	CAPS code and drug sub-group	
Anti infection and infestation		
	A1	Penicillin/Cephalosporin
	A2	Broad spectrum penicillin
	A3	Tetracycline
	A4	Antifungal
	A5	Sulphonamide
	A6	Other antibiotics
	A7	Anti-infective
Blood		
	B1	Haemopoietic
	B2	Other blood drug
Cardiovascular		
	C1	Antihypertensive
	C2	Antiarrythmic
	C3	Antiangina
	C4	Cardiac glycoside
	C5	Beta-blocker
	C6	Adrenergic stimulant
	C7	Peripheral vasodilator
	C8	Antimigraine
	C9	Other CVS drugs
	C95	Hypolipidaemic agents
Digestive		
	D1	Antacid
	D2	Antispasmodic/Propulsive
	D3	Antiulcerant
	D4	Laxatives
	D5	Antidiarrhoeals
	D6	Acids/Enzymes/Digestives
	D7	Topical Rectal
	D8	Mouth/throat(digest)topical
Eye medications		
	E1	Anti-infective eye
	E2	Mydriatics / Myotics
	E3	Steroid - eye
	E4	Eye medication other
Ear, nose topical		
	F1	Topical otic
	F2	Topical nasal

(continued)

Table A7 (continued): Coding Atlas for Pharmaceutical Substances (CAPS) Classification

Drug group	CAPS code and drug sub-group	
Surgical preparations		
	G1	Surgical preparations
Hormones		
	H1	Sex hormones/anabolic
	H2	Corticosteroids
	H3	Hypoglycaemic agents
	H4	Other Hormones
Allergy, immune system		
	J1	Antihistamines
	J2	Anti-allergy
	J3	Immunology
Anti neoplastics		
	K0	Anti-neoplastics N/S
	K1	Anti-neoplastics
	K2	Immune suppressants
Musculoskeletal		
	M1	NSAID
	M2	Antirheumatoid/other musculo
	M3	Urosuric agents
	M4	Rubs/Liniments/topical N/S
	M5	Muscle relaxants
Central nervous system		
	N1	Simple analgesics
	N2	Narcotic analgesics
	N3	Compound analgesics
	N6	CNS stimulants
	N7	Movement disorder/Antiparkinson
	N8	Anti-convulsants
	N9	Antiemetic/antinauseant
Psychological		
	P1	Sedative/Hypnotic
	P2	Anti-anxiety agents
	P3	Anti-psychotic agents
	P4	Anti-depressants
Diagnostic agents		
	Q1	Diagnostic agents
Respiratory		
	R1	Decong/Expector/Cold relief
	R2	Antitussive
	R3	Bronchodilator/Spasm relax
	R4	Theophyllines/other respir
	R5	Asthma preventives
Skin		
	S1	Anti-infective skin
	S2	Topical steroids
	S3	Other skin

(continued)

Table A7 (continued): Coding Atlas for Pharmaceutical Substances (CAPS) Classification

Drug group	CAPS code and drug sub-group	
Nutrition, metabolism		
	T1	Vitamins
	T2	Minerals/Tonics
	T3	Antiobesity agents
	T4	Nutrition/metabolism other
Urogenital		
	U0	Urogenital N/S
	U1	Urine antisept/infect/spasm
	U2	Diuretics
	U3	Topical vaginal
Contraceptives		
	X1	Oral contraceptives
	X2	IUDs, contraceptive device
	X3	Other contraceptive
Miscellaneous		
	Z1	Miscellaneous

Abbreviations

ACE-inhibitor	angiotensin converting enzyme inhibitor
Ag	antigen
AIHW	Australian Institute of Health and Welfare
ATC	anatomical therapeutic chemical (classification)
A&TSI	Aboriginal and/or Torres Strait Islander
BEACH	Bettering the Evaluation and Care of Health
BMI	body mass index
BP	blood pressure
C&S	culture and sensitivity
CAPS	Coding Atlas for Pharmaceutical Substances
CNS	central nervous system
COPD	chronic obstructive pulmonary disease
CT	computed tomography
CV	cardiovascular
CVS	cardiovascular system
DHAC	Commonwealth Department of Health and Aged Care
ECG	electrocardiogram
ESR	erythrocyte sedimentation rate
EUC	electrolytes, urea, creatinine
GP	general practitioner
HbA1c	glycohaemoglobin whole blood test
HIV	human immunodeficiency virus
ICPC	International Classification of Primary Care
ICPC-2	International Classification of Primary Care (Version 2)
ICPC-2 PLUS	an extended vocabulary of terms classified according to ICPC-2
IHD	ischaemic heart disease
MBS	Medicare Benefits Schedule
MC&S	microscopy culture and sensitivity
MRI	magnetic resonance imaging
NEC	not elsewhere classified
NESB	non-English-speaking background
NHMRC	National Health and Medical Research Council
NOS	not otherwise specified
NSAID	nonsteroidal anti-inflammatory drugs
OGTT	oral glucose tolerance test

OTCs	medications advised for over-the-counter purchase
PVD	peripheral vascular disease
RACGP	Royal Australian College of General Practitioners
RFE	reason for encounter
RICE	rest, ice, compression, elevation
RRMA	rural remote metropolitan area
SAND	Supplementary Analysis of Nominated Data
STD	sexually transmitted disease
TIA	transient ischaemic attack
URTI	upper respiratory tract infection
US	ultrasound
UTI	urinary tract infection
WHO	World Health Organization
WONCA	World Organisation of Family Doctors

Glossary

Aboriginal	The patient identifies himself or herself as an Aboriginal person.
Activity level	Number of general practice Medicare items claimed during the previous 12 months by a general practitioner.
Allied health professionals	Those who provide clinical and other specialised services to patients, including dieticians, pharmacists, occupational therapists and physiotherapists.
Consultation	See *Encounter.*
Diagnosis/problem	A statement of the provider's understanding of a health problem presented by a patient, family or community. GPs are instructed to record at the most specific level possible from the information available at the time. It may be limited to the level of symptoms.
• **new problem**	The first presentation of a problem to any medical practitioner, including the first presentation of a recurrence of a previously resolved problem.
• **old problem**	A previously assessed problem which requires ongoing care. Includes follow-up for a problem or an initial presentation of a problem previously assessed by another provider.
Encounter (enc)	Any professional interchange between a patient and a general practitioner:
• **direct**	Encounter where there is a face-to-face meeting of the patient and the general practitioner. Direct encounters can be further divided into encounters covered by
❖ **Medicare, including**	
– surgery consultations	encounters identified by any one of MBS item numbers 3; 23; 36; 44
– home visits	encounters identified by any one of MBS item numbers 4; 24; 37; 47
– hospital encounter	encounters identified by any one of MBS item numbers 19; 33; 40; 50
– nursing home visits	encounters identified by any one of MBS item numbers 20; 35; 43; 51
– other institutional visits	encounters identified by any one of MBS item numbers 13; 25; 38; 40
– other encounters	encounters identified by an MBS item number which does not identify place of encounter.
❖ **Workers' compensation**	Encounters paid by workers' compensation insurance.
❖ **Other**	Encounters paid from other sources (e.g. State health departments).

• **indirect**	Encounter where there is no physical or face-to-face meeting between the patient and the general practitioner but a service is provided (e.g. prescription, referral).
General practitioner (GP)	A medical practitioner who 'provides primary comprehensive and continuing care to patients and their families within the community' (Royal Australian College of General Practitioners).
Medication	Medication which is prescribed, advised for over-the-counter purchase or provided by the GP at the encounter.
Medication status	
• **new**	The medication prescribed/advised/provided at the encounter is being used for the management of the problem for the first time.
• **continuation**	The medication prescribed/advised/provided at the encounter is a continuation or repeat of previous therapy for this problem.
Morbidity	Any departure, subjective or objective, from a state of physiological wellbeing. In this sense, sickness, illness and morbid conditions are synonymous.
NESB	The patient reports coming from a non-English-speaking background, i.e. primary language spoken at home is not English.
OTCs	Medications advised for over-the-counter purchase.
Patient status	
• **new**	The patient has not been seen before in the practice.
• **old**	The patient has attended the practice before.
Problem	See *Diagnosis/problem.*
Provider	A person to whom a patient has access when contacting the health care system.
Reason for encounter (RFE)	The subjective reason given by the patient for seeing or contacting the general practitioner. It can be expressed in terms of symptoms, diagnoses or the need for a service.
Recognised GP	A medical practitioner who is: vocationally recognised under Section 3F of the Health Insurance Act, or a holder of the Fellowship of the Royal Australian College of General Practitioners who participates in, and meets the requirements for, quality assurance and continuing medical education as defined in the RACGP Quality Assurance and Continuing Medical Education Program, or undertaking an approved placement in general practice as part of a training program for general practice leading to the award of the Fellowship of the Royal Australian College of General Practitioners or undertaking an

	approved placement in general practice as part of some other training program recognised by the RACGP as being of equivalent standard. (Medicare Benefits Schedule book, 1 November 1999).
Referral	The process by which the responsibility for part or all of the care of a patient is temporarily transferred to another health care provider. Only new referrals to specialists, allied health professionals, emergency departments and hospital and nursing home admissions arising at a recorded encounter are included. Continuation referrals are not included. Multiple referrals can be recorded at any one encounter.
Torres Strait Islander	The patient identifies himself or herself as a Torres Strait Islander.

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Information on cardiovascular disease, its treatment and risk factors can be found on the Cardiovascular Health portal and the National Cardiovascular Disease Database, both located on the Institute's web site http://www.aihw.gov.au