

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		Reasons for encounter			Other problems managed		
	Per cent	All	New	All	New	All	New
		n 2,699	n 192	n 1,902	n 108	n 1,902	n 108
		Rate ^(a)		Rate ^(a)		Rate ^(a)	
Male	57.8	Ischaemic heart disease	26.5	23.0	Hypertension*	14.9	14.0
Female	42.2	Prescription all*	23.4	4.9	Lipid disorder	9.3	10.6
Age		Cardiac check-up*	16.1	9.0	Diabetes*	8.2	5.3
<1–14	0.1	Pain, chest NOS	12.7	44.8	Immunisation all*	5.0	4.5
15–24	0.1	General check-up*	9.5	4.6	Oesophageal disease	4.4	2.0
25–44	2.6	Hypertension*	5.4	4.2	Osteoarthritis*	3.9	2.3
45–64	22.4	Immunisation all*	4.6	2.6	Heart failure	3.5	1.7
65–74	33.5	Diabetes*	3.6	1.7	Depression*	2.9	0.9
75+	41.3	Shortness of breath	2.9	5.7	Asthma	2.5	4.9
Origin		Lipid disorder	2.8	5.7	Sleep disturbance	2.5	1.7
NESB	15.8						
A&TSI	0.8						

Medications		ISCHAEMIC HEART DISEASE			Other treatments		
	All	N = 1,488		All	New	All	New
	n 1,926	n 1,488		n 208	n 42	n 208	n 42
	Rate ^(b)	Rate ^(b)		Rate ^(b)		Rate ^(b)	
Glyceryl trinitrate	23.8	(1.1% of all problems managed)		Electrical tracings	3.9	23.3	23.3
Isosorbide nitrate	19.9	New problems = 114		Counselling — problem	2.2	4.7	4.7
Aspirin	13.0	(7.7% of all ischaemic heart disease problems)		Advice medication	1.9	0.9	0.9
Atenolol	6.5			Advice/education	1.0	2.4	2.4
Frusemide	5.9			Advice treatment	0.8	2.0	2.0
Diltiazem anti-angina	5.6			Advice exercise	0.7	0.0	0.0
Diltiazem anti-hypertens	5.1			Advice nutrition/weight	0.7	0.0	0.0
Digoxin	4.9			Observe/wait	0.4	1.0	1.0
Metoprolol	4.9			Advice health/body	0.4	0.0	0.0
Simvastatin	4.5			Advice smoking	0.4	0.0	0.0

Pathology		Imaging		Referrals			
	All	All	New	All	New		
	n 331	n 30	n 12	n 173	n 62		
	Rate ^(b)	Rate ^(b)		Rate ^(b)			
Lipids	5.9	X-ray; chest	1.3	8.2	Cardiologist	6.6	28.5
Full blood count	3.6	Echocardiography	0.3	1.4	ECG	2.7	17.3
EUC	3.5	Imaging other	0.1	0.3	Hospital admission	0.9	6.2
Liver function	2.6	Angiography; coronary	0.1	0.0	Other health profess	0.3	0.0
Cardiac enzymes	1.8				Specialist	0.3	1.0
Glucose tolerance	1.5				Physician	0.2	0.9
Coagulation	1.0				Occupational therap	0.1	0.0
Multibiochemical tests	0.5				Holter monitor	0.1	0.0
Other test NEC	0.4				Neurologist	0.1	0.0
Hepatitis serology	0.3				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)	
Fruzemide	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

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

HEART FAILURE	
N = 846	
(0.6% of all problems managed)	
New problems = 67	
(7.9% of all heart failure problems)	

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
Frusamide	2.5	0.0
Quinidine sulphate	2.1	0.0
Atenolol	1.2	0.0
Paracetamol	0.7	0.0

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

ATRIAL FIBRILLATION or FLUTTER	
N = 554	
(0.4% of all problems managed)	
New problems = 34**	
(6.1% of all atrial fibrillation or flutter problems)	

(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, propranolol, 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		Reasons for encounter		Other problems managed	
	Per cent	All	New	All	New
		n 266	n 110	n 143	n 52
		Rate ^(a)		Rate ^(a)	
Male	30.1	74.9	86.9	Hypertension*	12.1 16.9
Female	69.9	16.8	20.8	Depression*	6.3 7.7
Age		5.2	3.2	Menopausal complaint	5.5 5.7
<1–14	0.5	4.6	7.7	UTI*	4.0 3.3
15–24	2.8	4.5	3.9	Vit/nutrition deficiency	3.9 7.3
25–44	20.9	3.9	4.0	Hypothyroidism/myxoed	3.8 1.9
45–64	44.6	3.0	0.0	Osteoarthritis*	3.7 4.8
65–74	18.8	2.8	0.0	Dementia (incl senile)	2.5 0.0
75+	12.3	2.8	2.2	Back complaint*	2.1 0.7
Origin		2.6	0.0	Female genital check*	2.0 3.2
NESB	24.8				
A&TSI	1.6				

Medications		Other treatments	
	All	All	New
	n 49	n 58	n 31
	Rate ^(b)		Rate ^(b)
Atenolol	6.0	22.6	18.3
Propranolol	5.3	7.7	12.8
Sotalol	5.2	7.0	6.5
Verapamil	5.1	4.4	3.4
Digoxin	3.4	4.3	2.1
Amiodarone hcl	1.7	3.3	0.0
Metoprolol	1.7	2.5	4.4
Aspirin	1.6	2.2	2.6
Iron tablets	1.1	1.3	0.0
Quinidine sulphate	1.0	1.1	2.0

Pathology		Imaging		Referrals	
	All	All	New	All	New
	n 74	n 2	n 0	n 27	n 15
	Rate ^(b)		Rate ^(b)	Rate ^(b)	
Thyroid function	20.3	0.3	0.0	Cardiologist	6.8 3.6
Full blood count	12.6	0.3	0.0	ECG	5.6 10.3
Liver function	5.7			Holter monitor	4.9 7.7
Lipids	3.6			Hospital admission	0.9 2.2
EUC	3.6			Endocrinologist	0.6 1.6
Multibiochemical tests	1.5			Specialist	0.6 0.0
Ferritin	1.4			Doppler test	0.3 0.7
Infertility/pregnancy	1.1				
Cardiac enzymes	0.8				
Hormone assay	0.8				

PALPITATIONS

N = 139

(0.1% of all problems managed)

New problems = 57**

(0.4% of all palpitations problems)

(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
Fruzemide	1.1	0.0
Enoxaparin	1.0	0.0
Phenytoin	0.8	0.0

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

STROKE		
N = 170		
(0.1% of all problems managed)		
New problems = 29**		
(17.0% of all stroke problems)		

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

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

TRANSIENT ISCHAEMIC ATTACK	
N = 156	
(0.1% of all problems managed)	
New problems = 55**	
(35.2% of all transient ischaemic attack problems)	

(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