

12 Investigations

The GPs participating in the study were asked to record (in free text) any pathology, imaging or other tests ordered or undertaken at the encounter, and to nominate the patient problem(s) associated with each test order placed. This allows the linkage of test orders to a single problem or multiple problems. Up to five orders for pathology and two for imaging and other tests could be recorded at each encounter. A single test may have been ordered for the management of multiple problems, and multiple tests may have been used in the management of a single problem.

A pathology test order may be for a single test (for example, Pap smear, HbA1c) or for a battery of tests (for example, lipids, full blood count). Where a battery of tests was ordered, the battery name was recorded rather than each individual test. GPs also recorded the body site for any imaging ordered (for example, X-ray chest, CT head).

Data on investigations are reported for each year from 1998–99 to 2007–08 in the 10 year summary report *General practice activity in Australia 1998–99 to 2007–08: 10 year data tables* available from <www.aihw.gov.au/publications/index.cfm/subject/19> (AIHW catalogue number GEP 23).

12.1 Number of investigations

Table 12.1 shows the number of encounters and problems at which a pathology or imaging test was ordered. There were no tests recorded at a large majority (76.6%) of encounters.

At least one pathology test order was recorded at 17.4% of encounters (for 13.1% of problems managed), and at least one imaging test was ordered at 8.3% of encounters (for 5.7% of problems managed).

Table 12.1: Number of encounters and problems for which pathology or imaging ordered

Pathology/imaging test ordered	Number of encounters	Per cent of encounters (n = 95,898)	95% LCL	95% UCL	Number of problems	Per cent of problems (n = 145,078)	95% LCL	95% UCL
Pathology and imaging ordered	2,191	2.3	2.1	2.4	1,539	1.1	1.0	1.1
Pathology only ordered	14,448	15.1	14.5	15.6	17,494	12.1	11.6	12.5
Imaging only ordered	5,767	6.0	5.8	6.3	6,667	4.6	4.4	4.8
No tests ordered	73,492	76.6	75.9	77.3	119,379	82.3	81.8	82.8
At least one pathology ordered	16,639	17.4	16.7	18.0	19,033	13.1	12.7	13.6
At least one imaging ordered	7,958	8.3	8.0	8.6	8,205	5.7	5.4	5.9
At least one other investigation ordered	887	0.9	0.8	1.0	908	0.6	0.6	0.7
At least one other investigation performed in the practice	1,204	1.3	1.1	1.4	1,212	0.8	0.7	0.9
At least one other investigation ordered or performed	2,030	2.1	1.9	2.3	2,064	1.4	1.3	1.5

Note: LCL—lower confidence limit; UCL—upper confidence limit.

12.2 Pathology ordering

A comprehensive report on pathology ordering by GPs in Australia in 1998, written by the then General Practice Statistics and Classification Unit (GPSCU) using BEACH data, was published on the Internet by the Diagnostics and Technology Branch of the then Department of Health and Aged Care in 2000.¹⁵ A report on changes in pathology ordering by GPs from 1998 to 2001 was also produced by the GPSCU as an AIHW–University of Sydney book in the GP series in 2003.¹⁶ Readers may wish to compare those results with the information presented below.

Nature of pathology orders at encounter

The GPs recorded 41,375 orders for pathology tests/batteries of tests, at a rate of 43.2 per 100 encounters.

The distribution of pathology tests by MBS group, and the most common tests within each group are presented in Table 12.2. Each group and individual test is expressed as a percentage of all pathology tests, as a percentage of the group, and as a rate per 100 encounters with 95% confidence limits.

The pathology tests recorded were grouped according to the categories set out in Appendix 4, <www.aihw.gov.au/publications/index.cfm/subject/19>. The main pathology groups reflect those used in previous analyses of pathology tests by Medicare Australia (MBS groups).⁶⁰

Test orders classed as chemistry accounted for more than half of all pathology test orders, the most common being lipids, for which there were 4.3 orders per 100 encounters, liver function (3.1), EUC (3.0), and glucose/glucose tolerance (2.5 per 100 encounters).

Table 12.2: Distribution of pathology orders across MBS pathology groups and most frequent individual test orders within group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encounters (<i>n</i> = 95,898)	95% LCL	95% UCL
Chemistry*	23,916	57.8	100.0	24.9	23.6	26.2
Lipids*	4,079	9.9	17.1	4.3	4.0	4.5
Liver function*	2,954	7.1	12.4	3.1	2.8	3.4
EUC*	2,848	6.9	11.9	3.0	2.7	3.2
Glucose/tolerance*	2,429	5.9	10.2	2.5	2.3	2.8
Thyroid function*	2,324	5.6	9.7	2.4	2.2	2.6
Multibiochemical analysis*	1,886	4.6	7.9	2.0	1.7	2.2
Chemistry; other*	1,258	3.0	5.3	1.3	1.1	1.5
Ferritin*	1,191	2.9	5.0	1.2	1.1	1.4
HbA1c*	990	2.4	4.1	1.0	0.9	1.2
Prostate specific antigen*	826	2.0	3.5	0.9	0.8	0.9
Hormone assay*	745	1.8	3.1	0.8	0.6	0.9
C reactive protein	591	1.4	2.5	0.6	0.5	0.7

(continued)

Table 12.2 (continued): Distribution of pathology orders across MBS pathology groups and most frequent individual test orders within group

Pathology test ordered	Number	Per cent of all pathology	Per cent of group	Rate per 100 encounters (n = 95,898)	95% LCL	95% UCL
Haematology*	7,572	18.3	100.0	7.9	7.5	8.3
Full blood count*	5,602	13.5	74.0	5.8	5.5	6.2
ESR	917	2.2	12.1	1.0	0.8	1.1
Coagulation*	793	1.9	10.5	0.8	0.7	0.9
Microbiology*	5,432	13.1	100.0	5.7	5.3	6.0
Urine M,C&S*	1,709	4.1	31.5	1.8	1.7	1.9
Microbiology; other*	755	1.8	13.9	0.8	0.7	0.9
Hepatitis serology*	498	1.2	9.2	0.5	0.4	0.6
Faeces M,C&S*	326	0.8	6.0	0.3	0.3	0.4
Vaginal swab and M,C&S	313	0.8	5.8	0.3	0.3	0.4
HIV*	304	0.7	5.6	0.3	0.3	0.4
Chlamydia*	290	0.7	5.3	0.3	0.3	0.4
Cytology*	1,806	4.4	100.0	1.9	1.7	2.1
Pap smear*	1,765	4.3	97.7	1.8	1.6	2.0
Other NEC*	950	2.3	100.0	1.0	0.8	1.2
Blood test	424	1.0	44.6	0.4	0.3	0.6
Other test NEC	344	0.8	36.2	0.4	0.3	0.4
Tissue pathology*	740	1.8	100.0	0.8	0.6	0.9
Histology; skin	652	1.6	88.1	0.7	0.6	0.8
Immunology*	633	1.5	100.0	0.7	0.6	0.7
Immunology, other*	286	0.7	45.3	0.3	0.2	0.4
Antinuclear antibodies	167	0.4	26.5	0.2	0.1	0.2
Simple basic tests*	175	0.4	100.0	0.2	0.1	0.2
Infertility/pregnancy*	152	0.4	100.0	0.2	0.1	0.2
Total pathology tests	41,375	100.0	—	43.2	41.3	45.0

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: LCL—lower confidence limit; UCL—upper confidence limit; NEC—not elsewhere classified.

Problems for which pathology tests were ordered

Table 12.3 describes the most common problems for which pathology was ordered, in decreasing frequency order of problem–pathology combinations. Diabetes, hypertension, general check-ups and lipid disorders were the most common problems for which pathology tests were ordered. The two right-hand columns show the proportion of each problem that resulted in a pathology order, and the rate of pathology orders per 100 specified problems when at least one test is ordered. For example, 29.3% of contacts with diabetes resulted in pathology orders, and when pathology was ordered for diabetes, 283 tests were ordered per 100 diabetes contacts that resulted in a pathology test order. In contrast, only 10.9% of contacts with hypertension problems resulted in a pathology test, but the resulting test orders accounted for almost as many tests (6.8%) as did diabetes.

Table 12.3: The 10 problems for which pathology was most frequently ordered

Problem managed	Number of problems	Number of problem–path combinations ^(a)	Per cent of problem–path combinations ^(a)	Per cent of problems with test ^(b)	Rate of path orders per 100 problems with pathology ^(c)
Diabetes—all*	3,717	3,078	7.2	29.3	282.9
Hypertension*	9,496	2,896	6.8	10.9	278.6
General check-up*	2,407	2,564	6.0	33.7	315.7
Lipid disorders	3,541	2,181	5.1	27.6	222.8
Female genital check-up*	1,722	1,593	3.7	78.9	117.2
Weakness/tiredness general	625	1,473	3.4	62.4	377.9
Blood test NOS	413	1,193	2.8	85.2	339.5
Urinary tract infection*	1,525	957	2.2	54.7	114.7
Pregnancy*	1,279	881	2.1	31.9	215.7
Abnormal test results*	976	864	2.0	52.1	169.9
<i>Subtotal</i>	<i>25,701</i>	<i>17,680</i>	<i>41.3</i>	<i>—</i>	<i>—</i>
Total problems	145,078	42,835	100.0	13.1	225.1

(a) A test was counted more than once if it was ordered for the management of more than one problem at an encounter. There were 41,375 pathology test orders and 42,835 problem–pathology combinations.

(b) The percentage of total contacts with the problem that generated at least one order for pathology.

(c) The rate of pathology orders placed per 100 contacts with that problem generating at least one order for pathology.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: Path—pathology; NOS—not otherwise specified.

12.3 Imaging ordering

Readers wanting a more detailed study of imaging orders should consult the comprehensive report on imaging orders by GPs in Australia in 1999–00, written by the GPSCU using BEACH data, and published by the AIHW and the University of Sydney in 2001.¹⁷

Nature of imaging orders at encounter

There were 9,143 imaging test orders recorded, at a rate of 9.5 per 100 encounters.

The distribution of imaging tests by MBS group and the most common tests within each group are presented in Table 12.4. Each group and individual test is expressed as a percentage of all imaging tests, as a percentage of the group, and as a rate per 100 encounters with 95% confidence limits. Diagnostic radiology accounted for half of all imaging test orders while ultrasound accounted for a further 35.2%.

Table 12.4: The most frequent imaging tests ordered, by MBS group

Imaging test ordered	Number	Per cent of all imaging	Per cent of group	Rate per 100 encounters (n = 95,898)	95% LCL	95% UCL
Diagnostic radiology*	4,599	50.3	100.0	4.8	4.6	5.0
X-ray; chest	1,009	11.0	21.9	1.1	1.0	1.1
X-ray; knee	449	4.9	9.8	0.5	0.4	0.5
Mammography; female	329	3.6	7.2	0.3	0.3	0.4
Test; densitometry	303	3.3	6.6	0.3	0.3	0.4
X-ray; foot/feet	253	2.8	5.5	0.3	0.2	0.3
X-ray; hip	224	2.4	4.9	0.2	0.2	0.3
X-ray; shoulder	201	2.2	4.4	0.2	0.2	0.2
X-ray; ankle	176	1.9	3.8	0.2	0.1	0.2
X-ray; wrist	142	1.6	3.1	0.2	0.1	0.2
X-ray; spine; lumbosacral	137	1.5	3.0	0.1	0.1	0.2
X-ray; spine; lumbar	131	1.4	2.8	0.1	0.1	0.2
X-ray; hand	131	1.4	2.8	0.1	0.1	0.2
X-ray; abdomen	109	1.2	2.4	0.1	0.1	0.1
X-ray; spine; cervical	99	1.1	2.1	0.1	0.1	0.1
X-ray; finger(s)/thumb	95	1.0	2.1	0.1	0.1	0.1
X-ray; spine; thoracic	82	0.9	1.8	0.1	0.1	0.1
Ultrasound*	3,215	35.2	100.0	3.4	3.2	3.5
Ultrasound; pelvis	515	5.6	16.0	0.5	0.5	0.6
Ultrasound; shoulder	293	3.2	9.1	0.3	0.3	0.3
Ultrasound; breast; female	278	3.0	8.7	0.3	0.2	0.3
Ultrasound; abdomen	276	3.0	8.6	0.3	0.2	0.3
Ultrasound; obstetric	230	2.5	7.2	0.2	0.2	0.3
Test; doppler	140	1.5	4.3	0.2	0.1	0.2
Echocardiography	139	1.5	4.3	0.2	0.1	0.2
Ultrasound; kidney	104	1.1	3.2	0.1	0.1	0.1
Ultrasound; renal tract	100	1.1	3.1	0.1	0.1	0.1
Ultrasound; scrotum	90	1.0	2.8	0.1	0.1	0.1
Ultrasound; abdomen upper	79	0.9	2.4	0.1	0.1	0.1
Ultrasound; leg	75	0.8	2.3	0.1	0.1	0.1
Ultrasound; neck	70	0.8	2.2	0.1	0.1	0.1
Ultrasound; thyroid	69	0.8	2.1	0.1	0.1	0.1
Computerised tomography*	1,164	12.7	100.0	1.2	1.1	1.3
CT scan; brain	181	2.0	15.6	0.2	0.2	0.2
CT scan; abdomen	175	1.9	15.1	0.2	0.2	0.2
CT scan; spine; lumbar	133	1.5	11.4	0.1	0.1	0.2
CT scan; head	111	1.2	9.6	0.1	0.1	0.1
CT scan; spine; lumbosacral	94	1.0	8.1	0.1	0.1	0.1

(continued)

Table 12.4 (continued): The most frequent imaging tests ordered, by MBS group

Imaging test ordered	Number	Per cent of all imaging	Per cent of group	Rate per 100 encounters (n = 95,898)	95% LCL	95% UCL
CT scan; chest	79	0.9	6.8	0.1	0.1	0.1
CT scan; sinus	76	0.8	6.5	0.1	0.1	0.1
Nuclear medicine imaging*	105	1.1	100.0	0.1	0.1	0.1
Scan; bone(s)	62	0.7	59.6	0.1	0.0	0.1
Magnetic resonance imaging	60	0.7	100.0	0.1	0.0	0.1
Total imaging tests	9,143	100.0	—	9.5	9.2	9.9

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: LCL—lower confidence limit; UCL—upper confidence limit; CT—computerised tomography.

Problems for which imaging tests were ordered

Table 12.5 describes the most common problems for which imaging was ordered, in decreasing frequency order of problem–imaging combinations. The most common problem for which imaging was ordered was back complaint, accounting for 5.7% of orders, followed by osteoarthritis (4.5%), and fracture (4.2%). The two right-hand columns show the proportion of each problem that resulted in an imaging test, and the rate of imaging tests per 100 specified problems when at least one test was ordered. For example, 36.7% of contacts with fractures resulted in an imaging test and 109.6 tests were ordered per 100 fracture contacts when at least one test was ordered.

Table 12.5: The 10 problems for which an imaging test was most frequently ordered

Problem managed	Number of problems	Number of problem–imaging combinations ^(a)	Per cent of problem–imaging combinations	Per cent of problems with test ^(b)	Rate of imaging orders per 100 problems with imaging ^(c)
Back complaint*	2,624	524	5.7	17.0	117.7
Osteoarthritis*	2,484	413	4.5	14.6	113.8
Fracture*	959	386	4.2	36.7	109.6
Sprain/strain*	1,509	319	3.5	17.5	120.7
Injury musculoskeletal NOS	841	300	3.3	31.2	114.4
Pregnancy*	1,279	292	3.2	22.2	102.6
Abdominal pain*	628	253	2.7	37.1	108.5
Bursitis/tendonitis/synovitis NOS	789	204	2.2	22.7	113.5
Breast lump/mass (female)	183	198	2.2	72.2	150.0
Injury skin; other	587	153	1.7	21.6	120.4
<i>Subtotal</i>	<i>11,883</i>	<i>3,042</i>	<i>32.9</i>	—	—
Total problems	145,078	9,221	100.0	5.7	112.4

(a) A test was counted more than once if it was ordered for the management of more than one problem at an encounter. There were 9,143 imaging test orders and 9,221 problem–imaging combinations.

(b) The percentage of total contacts with the problem that generated at least one order for imaging.

(c) The rate of imaging orders placed per 100 contacts with that problem generating at least one order for imaging.

* Includes multiple ICPC-2 and ICPC-2 PLUS codes (see Appendix 4, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: NOS—not otherwise specified.

12.4 Other investigations

Other investigations include diagnostic procedures ordered by the GP at the encounter or undertaken by the GP or practice staff. There were a total of 934 other investigations ordered by GPs during the study year and 1,256 other investigations undertaken by the GP or practice staff during the study year. This means there were 2,190 total other investigations either ordered or undertaken in the practice (Table 12.6).

Most frequent other investigations

The first half of Table 12.6 lists the most common other investigations ordered by GPs. The second half lists the most common other investigations undertaken in the practice by GPs or practice staff. The total number of these investigations ordered by the GP or undertaken in the practice is shown in the table. Each investigation is expressed as a percentage of ordered or undertaken other investigations, and as a rate per 100 encounters with 95% confidence limits.

Table 12.6: Most frequent other investigations ordered by GPs or performed in the practice

Investigation ordered	Number	Per cent of ordered investigations	Rate per 100 encounters (n = 95,898)	95% LCL	95% UCL
Electrical tracings*	450	48.1	0.5	0.4	0.5
Diagnostic endoscopy*	261	27.9	0.3	0.2	0.3
Physical function test*	190	20.4	0.2	0.1	0.3
Other diagnostic procedures*	24	2.5	0.0	0.0	0.0
<i>Subtotal</i>	925	98.9	—	—	—
Total other investigations ordered	934	100.0	1.0	0.9	1.1
Investigation undertaken in the practice	Number	Per cent of undertaken investigations	Rate per 100 encounters (n = 95,898)	95% LCL	95% UCL
Electrical tracings*	542	43.2	0.6	0.5	0.6
Physical function test*	491	39.1	0.5	0.4	0.6
Other diagnostic procedures*	185	14.7	0.2	0.1	0.3
Diagnostic endoscopy*	37	2.9	0.0	0.0	0.1
<i>Subtotal</i>	1,255	99.9	—	—	—
Total other investigations undertaken	1,256	100.0	1.3	1.1	1.5
Total other investigations ordered or undertaken in the practice	2,190	—	2.3	2.1	2.5

* Includes multiple ICPC-2 or ICPC-2 PLUS codes (see Appendix 4, <www.aihw.gov.au/publications/index.cfm/subject/19>).

Note: LCL—lower confidence limit; UCL—upper confidence limit.