

Queensland Department of Health

**Casemix Coding Audit
and Process Review
Final Report**

May 2002

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1 Executive Summary

1.1 Aim of the project

KPMG Consulting undertook a coding audit and process review of selected public hospitals on behalf of the Queensland Department of Health. The aims of the project were:

- 1 To assess the quality of coded data and its impact on DRG accuracy for targeted case types in Queensland public hospitals.
- 2 To review admissions where the reported data indicated the patient was an elective (waiting list) case admitted through the emergency department.
- 3 To review short stay Emergency Department admissions for the purposes of understanding the circumstances for which these patients presented.

1.2 Project scope

The project was undertaken at the:

- Royal Brisbane Hospital
- Royal Women's Hospital
- Princess Alexandra Hospital
- Townsville General Hospital
- Mackay Base Hospital
- Nambour General Hospital
- Rockhampton Hospital
- Royal Children's Hospital
- Prince Charles Hospital
- Mount Isa Base Hospital
- Cairns Base Hospital
- Ipswich Hospital
- Gold Coast Hospital

Separate reports have been prepared for each hospital dealing specifically with the issues encountered at the hospital.

The sample was selected from 2000/2001 hospital discharges as follows:

- **Short-stay emergency department admissions review:** - a stratified random sample of cases were selected for review with each stratum defined by the length of stay (hours) in hospital as follows:
 - ≤ 1 hour
 - $1 < \text{LOS} \leq 2$ hours
 - $2 < \text{LOS} \leq 4$ hours
 - $4 < \text{LOS} \leq 8$ hours
 - > 8 hours.
- **Booked surgical cases review:** a random sample of cases were selected, except for those hospitals that had small population size, in which case, all admissions were selected for review.

- **Coding audit:** a random sample of targeted DRGs were selected for the coding audit in addition to a sub-set of those cases selected for the booked surgical review.

1.3 Summary of statistical results

The main statistical findings are:

Coding Audit

- 1 A total of 2512 admissions were audited varying from 70 to 371 admissions at individual hospitals.
- 2 The DRG error rate for individual hospitals varied from 6.2% to 27.1% of targeted cases selected for the audit. However, these error rates are not comparable because the targeted DRGs varied for each of the hospitals. In addition, the results for any one hospital are not reflective of the overall DRG error rate for that hospital, given the non-representative nature of the sample selection process.
- 3 The type of error was distributed across a number of categories with 17% of records having an incorrect principal diagnosis, 18% having an incorrect procedure code, 22% having an incorrect diagnosis code, 26% having redundant (over) codes, 27% having a missing diagnosis code, and 13% a missing procedure code.

Short stay emergency department review

- 4 A total of 1110 cases were reviewed (out of a population of 6862 cases that met the criteria for review), ranging between hospitals from 7 to 104 cases with one hospital having no cases that met the criteria for review.
- 5 Approximately 79% of the short stay emergency department admissions contained at least one of the specified clinical indications in the medical record (refer to Appendix D for the list of the indicators). This varied from 13.3% to 100% across the hospitals included in the review with all but one hospital having at least two thirds of cases matching one of the clinical indicators.
- 6 Many of the medical records had no formal documentation of an 'authority to admit' the patient (62%). This varied from 100% to 14% of cases with no formal documentation.

Booked surgical admissions review

- 7 A total of 425 cases were reviewed (out of a population of 574 cases that met the criteria for review), ranging between hospitals from 4 to 156 cases.
- 8 Approximately 46% of cases did not have formal emergency department notes in the medical record (i.e., Category A); this varied from 17% to 91%, (excluding hospitals with small sample sizes) (See section 5.1 for a list of audit categories);

- for some cases this reflected an incorrect admission source (i.e. the patient was not admitted through the emergency department);
 - for remaining cases, the patients were treated in the Emergency Department but there were no formal Emergency Department notes primarily as the patients were not an emergency but the ED facility was being used for minor procedural surgery such as excision of skin lesion, or for medical diagnostic cases such as CAT scan; this occurred primarily in regional centres.
- 9 Approximately 44% of all cases reviewed did not have documentation in the medical record that indicated that the patient was on the waiting list (i.e. Category B and C), indicating either a documentation problem or that the admission type was not correct. This varied from 7% to 81% (excluding hospitals with small sample sizes).
- 10 Cases where the record contained waiting list notation and the procedure was not performed as an emergency (Category D), were primarily in circumstances similar to above where the Emergency Department facility is being used for minor procedural elective work.

1.4 Issues arising from the coding audit

A number of issues have been identified some of which can be pursued through the Queensland Coding Committee. Consequently we make the following recommendation:

Recommendation 1: The Queensland Coding Committee be used as a forum for hospitals to consider strategies and to exchange information on their experiences to address the following issues:

- 1 Coder education strategies (refer section 4.2.2)
- 2 Coder workforce issues (refer section 4.2.4)
- 3 Quality control procedures (refer section 4.2.8)

1.4.1 Non-compliance with Australian Coding Standards

Recommendation 2: that each hospital reviews its current coding practices in relation to those standards where the audit identified problems with the application of those standards, and that the hospital provides coding staff with supplementary education regarding those standards.

Recommendation 3: The Department together with the Queensland Coding Committee review its coding guidelines for those coding standards and those DRGs where current coding practices are inadequate.

The standards where hospitals current practices are non-compliant include:

- ACS 0001 *Principal Diagnosis*
- ACS 0002 *Additional Diagnoses*
- ACS 0031 *Anaesthesia*
- ACS 0401 *Diabetes Mellitus*
- ACS 1521 *Conditions Complicating Pregnancy*
- ACS 1905 *Closed Head Injury/Loss of Consciousness/Concussion*
- ACS 1907 *Multiple Injuries*

The DRGs with high error rates are listed in Appendix B.

1.4.2 Coder education and support

There was insufficient coder education in many hospitals regarding the Australian Coding Standards, the impact of coding on DRG assignment and regarding changing clinical practices. There was often no opportunity for the coding staff to give and receive feedback on coding issues with the medical staff. This kind of two-way interaction with clinical staff would highlight the need for quality documentation for coding. Further, it is important that clinicians better understand the critical need for greater specificity in medical record documentation. This is important not only for accurate coding but also the integrity of the medical record.

Recommendation 4: that individual hospitals enhance their current coder education and support activities to ensure that:

- there is a structured and on-going education program for Coders, which includes interpretation of coding standards and clinical information to ensure accurate coding;
- there are coder forums that incorporate coding education, casemix and documentation issues to improve consistency between Coders and understanding of all specialties;
- coding and interpretation of the Australian Coding Standards is consistent amongst all Coders in regards to head injuries and obstetric complications; and
- Coders have clinical education sessions by the medical staff at their hospital.

Refer also to Recommendation 1.

1.4.3 Clinician engagement

Two issues arose from qualitative feedback from auditors. Firstly, there were many cases where coders needed to obtain clarification from clinicians without which coding errors would result. In some cases, coding staff would deduce or make assumptions about the clinical specificity based on for example, the treating unit or the nature of the treatment. This practice is contrary to Australian coding standards.

Secondly, there is opportunity for hospitals to have more input from clinicians to the coding program and coder education activities. This would help to improve clinician understanding of casemix coding issues and of specific areas of coding where clinical specificity can impact on DRG assignment.

Recommendation 5: individual hospitals review and promote increased clinician input to coding practices particularly for clinicians to provide coding staff with information on changes to clinical terminology and emerging procedures and therapies.

1.4.4 Coder workforce issues

Many hospitals experienced high turnover of coding staff that contributed to coding inaccuracy. This problem is already acknowledged in Queensland (and for that matter in other Australian States). Some hospitals need to consider strategies to retain staff, such as the approach used at Princess Alexandra Hospital that has introduced a competency program for Coders aimed at providing more accurate coding, and a career pathway for Coders. The Queensland Coding Committee is an ideal forum for hospitals to exchange information on their strategies to retain staff.

Refer to Recommendation 1.

1.4.5 Admission issues

A number of coding problems were identified associated with admissions through the Emergency Department. The underlying issue facing coding staff that results in variability in coding practice relates to whether or not to code events that occur as part of the hospital episode of care but prior to the admission component of that episode of care (i.e., prior to the recorded time of admission). This is compounded by inadequate documentation of the time of admission and variability in practice in determining time of admission. A related but separate issue is what appears to be variability in admission practices across hospitals for patients who present at emergency departments.

There is also variability in the selection of admission source for cases where the patient is not an emergency presentation but where the ED is being used as a treatment facility.

Recommendation 6: Queensland Department of Health review and clarify existing guidelines for coding diagnoses and procedures that relate to Emergency Department attendances when patients are subsequently admitted.

Recommendation 7: the Department clarifies its guidelines regarding designation of admission source for patients who are treated in Emergency Departments in cases where the patient is not an emergency presentation but where the ED is being used as an elective treatment facility.

1.4.6 Documentation issues

It is acknowledged that in any audit, documentation can appear as a reason for inaccurate coded data. In this audit, an issue arose regarding conflicting documentation by various Clinicians treating the patient. The issue was in regards to a Registrar using conflicting terminology to that of a Specialist or other Clinician. The question arose as to whose documentation should be taken into account to ensure correct coding. It is important that each hospital has a policy regarding documentation of verbal information provided by clinicians regarding documentation queries raised by coders and a policy on responsibility for final decisions regarding clinical information when there is conflicting information from multiple sources.

Recommendation 8: that hospitals clarify their policy regarding clinician responsibility for medical record documentation and that this is communicated to clinicians and coding staff.

1.4.7 Administration issues

The audit revealed an over reliance of automated processes. There were two in particular:

1. Encoder

It was found that Coders were not questioning the codes produced by the Encoder, as it relies on terms input by the Coder to lead to the correct pathway and an appropriate code. Adequate knowledge of the ICD10-AM manuals ensures that Coders can question any incorrect codes, which may be suggested by the Encoder.

We appreciate the usefulness of the Encoder. This problem could be minimised if new Coders use the ICD10-AM manuals for a specific period of time eg, three months, prior to using the Encoder. There should also be a periodic review of Coders using the Encoder to ensure that they do not lapse into a practice of over relying on the Encoder in their coding decisions.

2. *Auto coding of repetitive cases*

The coding of renal dialysis patients is automated in most hospitals, a practice that in itself is not an issue and is important for coding productivity. An issue arose during the audit regarding patients presenting to the dialysis unit, but not primarily for renal dialysis, for example, peritoneal dialysis patients. There were occasions when these patients were being treated in the dialysis unit for conditions relating to their dialysis, and presenting for investigations and monitoring of these conditions. Therefore the principal diagnosis changes, as well as the DRG of the patient being treated. However, they were being encoded (automatically) because they were being treated in the dialysis unit. The extent of the problem is not known, but could be significant given the large number of admissions to dialysis units.

Recommendation 9: that hospitals review their auto coding practice with a view to either modify their auto coding software to ensure that such cases are identified for review or modify practices such that only 'straight forward cases' are flagged for auto coding.

1.4.8 Quality control procedures

Hospitals employed a range of quality review and quality control practices. Often however, they did not have a sufficiently structured quality control program. The consequences of this are evident in the audit results whereby easily detectable errors had not been noticed by staff (eg auto coding errors). A structured program would focus on known areas of coding difficulty, on case types where clinical specificity or lack thereof could impact DRG assignment and on computerised, manual and documentation processes that could impact on coding integrity. A structured approach would also provide forums for coding staff and clinicians to consider coding quality issues. The Queensland Coding Committee is an ideal forum for hospitals to exchange information on their quality control practices and procedures.

Refer to Recommendation 1.

2 Introduction

KPMG Consulting undertook a coding audit and process review of selected public hospitals on behalf of the Queensland Department of Health. The aims of the project were as follows:

- 1 To assess the quality of coded data and its impact on DRG accuracy for targeted case types in Queensland public hospitals.
- 2 To review admissions where the reported data indicated the patient was an elective (waiting list) case admitted through the emergency department.
- 3 To review short stay Emergency Department admissions for the purposes of understanding the circumstances for which these patients presented.

This is the third audit commissioned by the Department but it differs markedly from previous audits. The previous audits were based on a random sample of cases and were used to estimate overall hospital coding and DRG error rates. This audit targeted specific case types for review and thus the results are not indicative of overall error rates for the selected hospitals. The purpose for targeting the audit was to identify reasons for atypical or abnormal coding and DRG profiles for selected hospitals.

Further, this audit was extended to include a review of short stay emergency admissions and of patients admitted from the waiting list but admitted through the emergency department. The purpose of the short stay emergency admission review was to identify the clinical characteristics of these admissions and to identify the extent to which these cases included specified clinical indications. The purpose of the booked surgical case review was to assess the quality of associated documentation regarding the following:

- whether or not the cases were emergency department admissions or this had been erroneously recorded as such; and
- whether there was the relevant waiting list documentation within the medical record.

This report provides details of the aggregate results across all hospitals. Separate reports have been prepared for each hospital dealing specifically with the issues encountered at the hospital.

3 Audit Scope and Methodology

3.1 Scope of Audit

The following parameters define the scope of the audit:

Hospitals: The hospitals included in the audit were:

- Royal Brisbane Hospital;
- Royal Children's Hospital;
- Royal Women's Hospital;
- Prince Charles Hospital;
- Princess Alexandra Hospital;
- Mount Isa Base Hospital
- Townsville General Hospital;
- Cairns Base Hospital;
- Mackay Base Hospital;
- Ipswich Hospital;
- Nambour General Hospital;
- Gold Coast Hospital; and
- Rockhampton Hospital.

Time period: The sample was selected from hospital discharges for the 2000/2001 financial year.

DRG Version: AN-DRG 4.1

Coding Standard: Second edition of ICD-10-AM

3.2 Audit methodology

The main requirements for the coding audit were:

- the audit be undertaken in accordance with the Australian Coding Standards;
- hospitals were to be given the opportunity to review cases where the audit DRG differed to the hospital assigned DRG; and
- summary debriefing sessions were to be conducted at the conclusion of the audit in each hospital.

Each auditor was issued with a copy of an audit manual developed by KPMG Consulting for the project. The manual contained details of the audit methodology, instructions for hospital liaison, details of the scope of the audit, guidelines for dispute resolution and instructions for transmission of the data.

3.3 Sampling

The Department selected the coding audit sample based upon the following:

- an analysis of casemix data using a data mining tool developed by KPMG Consulting for the Department; this tool enabled the Department to identify atypical and abnormal casemix profiles;
- known areas of problematic coding; and
- in some cases, a subset of records also selected for the booked surgical review.

Caution: The final sample was a targeted sample and not representative of hospitals' casemix. Therefore the results (coding error and DRG error rates) are not reflective of overall error rates for any one hospital.

For the two supplementary reviews, a random sample of cases were selected except for those hospitals that had small population sizes, in which case all admissions were selected for review. Details of the sample selected and the actual number of cases completed are contained in Appendix A. Note that the auditors exceeded the minimum sample size target set by the Department in all cases for the coding audit.

3.4 Audit Team

A team of six auditors were used all of whom are accredited and have had considerable previous audit experience in Australia and in some cases, internationally. The audit team was a mix of senior Health Information Managers working in tertiary public hospitals (from interstate) and independent contractors.

3.5 Audit software

Auditors used KPMG Consulting proprietary audit software that was augmented to accommodate the two supplementary reviews and third party Grouper software licensed to Queensland Health.

3.6 Conduct of the audit

The audit was undertaken as follows:

Pilot study: Queensland Health staff undertook a pilot of the methodology developed for the two supplementary reviews. Minor changes¹ were made to the methodology after the first day of review at the first hospital (Nambour). The change in methodology did not affect the comparability of the results, as the data obtained for cases reviewed on the first day was modified in accordance with the modified methodology.

Pre-audit contact: Each hospital was notified of the audit requirements in writing and then contacted by the audit supervisor approximately one week prior to the commencement of the audit.

Field Audit: Commenced on 12 February 2002 and was concluded on 3 May 2002.

Hospital feedback:

The Audit Supervisor generally presented cases with a DRG change, resulting from the audit, to hospital staff on a daily basis. This provided hospital staff with an opportunity to consider the Auditors comments and to raise issues that may not have been evident to the Auditor thereby explaining the hospital's original coding. Cases in dispute were initially referred to KPMG Consulting's Audit Project Manager and then onto the Department in the event that the hospital and the Project Manager did not agree on the audit outcome. Further, each hospital participated in a formal feedback session that was conducted at the conclusion of the coding audit. The purpose of which was to provide feedback on issues that had a significant bearing on errors detected by the auditors.

3.7 Project management and quality control

A number of processes were implemented to ensure that the project proceeded in accordance with the Department's requirements, namely:

- advance advice was provided to hospitals on the timetable for the audit together with information on details of audit requirements such as preparation of the medical records;
- the Audit Supervisor contacted each hospital one week before the audit to ensure that the hospital was on schedule to participate in the project;
- daily monitoring of progress with the audit at each hospital facilitated by the electronic transmission of audit results to a central database on a daily basis;

¹ One change was made to the methodology for the short stay emergency admissions review, namely, the inclusion of an additional clinical indicator for 'post procedural observation'. The elective surgery review was augmented by the addition of a question for Category C cases. Refer to Appendix C.

- daily backup of audit database to ensure no loss or corruption of audit data; and
- regular meetings between the KPMG Consulting's management team with the Department team to deal with any issues as they arose.

3.8 Issues impacting on the project

There were no major issues impacting on the conduct of the project. Hospitals cooperated fully in the exercise and are to be commended for this. Further, hospital staff, particularly those in rural and regional locations welcomed the coding audit in particular, as it provided opportunity for coding staff to discuss coding issues and to seek clarification of coding standards. The need for additional support for coding staff in rural and regional hospitals is discussed in section 4.2.2.

4 Coding audit findings

4.1 Quantitative findings

4.1.1 Summary of results

A total of 2512 admissions were audited varying from 70 to 371 admissions at individual hospitals.

The following tables summarise the main statistical outcomes of the coding audit. We consider the following parameters:

- the impact of data errors on DRG assignment;
- the type of error encountered during the audit; and
- the reason for the error.

Table 1: Impact of errors on DRG assignment based on a targeted and non-comparable sample

<i>Hospital</i>	<i>Records audited</i>	<i>Coding error records</i>	<i>% coding error</i>	<i>Coding errors per record*</i>	<i>DRG changes</i>	<i>% DRG change</i>
Prince Charles	201	184	91.5%	4.0	34	16.9%
Royal Brisbane	371	281	75.7%	3.8	55	14.8%
Royal Children's	120	68	56.7%	2.0	11	9.2%
Royal Women's	105	84	80.0%	2.9	13	12.4%
Princess Alexandra	342	277	81.0%	4.1	55	16.1%
Ipswich	174	117	67.2%	2.0	29	16.7%
Nambour	197	126	64.0%	2.6	25	12.7%
Gold Coast	229	153	66.8%	2.3	36	15.7%
Rockhampton	162	71	43.8%	1.8	10	6.2%
Mackay	125	58	46.4%	1.8	13	10.4%
Townsville	192	146	76.0%	3.0	48	25.0%
Cairns	224	147	65.6%	2.6	43	19.2%
Mount Isa	70	40	57.1%	1.9	19	27.1%

* Average number of coding errors found per record in error.

The main features are as follows:

- 1 The DRG error rate for individual hospitals varied from 6.2% to 27.1% of targeted cases selected for the audit. However, these error rates **are not comparable** because the targeted DRGs varied for each of the hospitals. In addition, the results for any one hospital are not reflective of the overall DRG error rate for that hospital, given the non-representative nature of the sample selection process.
- 2 The average number of errors per record also varied across the hospitals ranging from 1.8 to 4.1 coding errors per record.

We have not calculated the impact on average DRG resource weight as the sample of any one hospital is not representative of the casemix population of that hospital.

The table overleaf provides information on the type of error detected by the auditors using the following definitions:

- **Incorrect principal diagnosis:** signifies that the selection of the principal diagnosis was not correct. This is not to be used in cases when the code is incorrect but the diagnosis is correct. Cases where the condition selected is correct, but the code is incorrect will be captured in the category: Incorrect diagnosis code.
- **Incorrect diagnosis code:** the diagnosis code was not correct at any level.
- **Incorrect procedure code:** the procedure code was not correct at any level.
- **Missing secondary diagnosis code:** secondary diagnosis codes that were not recorded within the admission (not associated with an incorrect secondary diagnosis code).
- **Missing procedure code:** procedure codes that were not recorded within the admission (not associated with an incorrect secondary diagnosis code).
- **Over-coding:** unnecessary codes (diagnosis or procedure codes) within the admission.
- **Unsubstantiated code:** diagnosis or procedure code where there was not sufficient information within the record to substantiate that code; this should include codes where either the base condition or the 5th digit level is not substantiated by clinical documentation.
- **Other unspecified error:** not classified above.

Table 2: Type of coding error

Hospital	Records audited	Incorrect principal diagnosis			Incorrect diagnosis code			Incorrect procedure code			Missing secondary diagnosis code			Missing procedure code			Over coding			Unsubstantiated code			Other		
		%in error	per record*	Errors	%in error	per record*	Errors	%in error	per record*	Errors	%in error	per record*	Errors	%in error	per record*	Errors	%in error	per record*	Errors	%in error	per record*	Errors	%in error	per record*	
Prince Charles	201	19.9%	1.0	40	32.3%	1.4	18.4%	1.5	1.5	39.3%	2.0	21.4%	1.6	53.2%	2.3	19.9%	1.8	1.0	1.0%	1.0	1.6%	1.7	-	-	
Royal Brisbane	371	11.9%	1.0	44	28.6%	1.4	27.5%	1.4	1.4	29.9%	2.1	13.5%	1.9	34.2%	2.1	19.1%	1.9	1.6%	1.7	1.6%	1.7	-	-		
Royal Children's	120	20.8%	1.0	25	11.7%	1.1	8.3%	1.3	1.3	5.8%	1.1	5.8%	1.3	11.7%	1.3	20.0%	2.0	-	-	-	-	-	-		
Royal Women's	105	25.7%	1.0	27	19.0%	1.2	36.2%	1.2	1.2	23.8%	1.6	16.2%	1.7	28.6%	1.5	18.1%	1.6	-	-	-	-	-	-		
Princess Alexandra	342	18.7%	1.0	64	36.0%	1.7	18.7%	1.8	1.8	40.9%	2.3	19.0%	2.4	23.7%	1.8	18.4%	1.5	1.2%	1.8	1.2%	1.8	0.6%	3.0		
Ipswich	174	19.5%	1.0	34	13.8%	1.1	18.4%	1.2	1.2	20.7%	1.4	8.6%	1.1	20.1%	1.7	5.7%	1.4	0.6%	3.0	0.6%	3.0	-	-		
Nambour	197	19.3%	1.0	38	11.2%	1.2	15.7%	1.2	1.2	21.8%	1.4	8.1%	1.2	33.0%	2.1	3.6%	1.1	-	-	-	-	-	-		
Gold Coast	229	16.2%	1.0	37	15.3%	1.1	19.2%	1.2	1.2	31.0%	1.4	16.6%	1.2	14.8%	1.6	7.0%	1.4	-	-	-	-	-	-		
Rockhampton	162	3.7%	1.0	6	14.8%	1.3	7.4%	1.2	1.2	13.6%	1.3	9.3%	1.2	11.1%	1.2	4.9%	1.1	0.6%	1.0	0.6%	1.0	-	-		
Mackay	125	4.0%	1.0	5	13.6%	1.0	8.8%	1.1	1.1	17.6%	1.2	8.0%	1.5	10.4%	1.5	6.4%	1.1	0.8%	1.0	0.8%	1.0	-	-		
Townsville	192	24.0%	1.0	46	21.9%	1.2	6.8%	1.3	1.3	19.8%	1.7	8.3%	1.4	32.8%	2.1	19.8%	2.6	1.5%	1.3	1.5%	1.3	-	-		
Calms	224	18.3%	1.0	41	20.5%	1.3	19.2%	1.3	1.3	28.1%	1.7	13.4%	1.1	21.4%	1.3	7.6%	1.5	0.4%	1.0	0.4%	1.0	-	-		
Mount Isa	70	25.7%	1.0	18	7.1%	1.0	8.6%	1.0	1.0	14.3%	1.3	10.0%	1.4	14.3%	1.8	4.3%	1.3	-	-	-	-	-	-		
Total	2512	16.9%	1.0	424	21.6%	1.7	17.6%	1.7	1.7	26.6%	1.3	13.1%	1.4	25.7%	1.8	12.9%	1.3	0.8%	0.8%	0.8%	0.8%	-	-		

* Average number of coding errors found per record in error.

* Average number of coding errors found per record in error.

The main features are as follows:

- 1 The type of error was distributed across a number of categories with 17% of records having an incorrect principal diagnosis, 18% having an incorrect procedure code, 22% having an incorrect diagnosis code, 26% having redundant (over) codes, 27% having a missing diagnosis code, and 13% a missing procedure code.
- 2 Over-coding and unsubstantiated coding tended to occur as multiple occurrences within the one record with many of the hospitals having more than one such error per record.

The following table indicates the reason for errors detected by the auditors.

Table 3: Reason for coding errors

Hospital	Records audited	Records in error*	% in error*	Data entry transcription error		Non-compliant with coding standards		Inadequate documentation		Other	
				Records in error	% of those in error**	Records in error	% of those in error**	Records in error	% of those in error**	Records in error	% of those in error**
Prince Charles	201	184	91.5%	-	-	74	40.2%	8	4.3%	105	57.1%
Royal Brisbane	371	288	77.6%	-	-	145	50.3%	18	6.3%	128	44.4%
Royal Children's	120	71	59.2%	-	-	9	12.7%	18	25.4%	49	69.0%
Royal Women's	105	84	80.0%	-	-	16	19.0%	7	8.3%	61	72.6%
Princess Alexandra	342	278	81.3%	1	0.4%	53	19.1%	8	2.9%	216	77.7%
Ipswich	174	118	67.8%	-	-	6	5.1%	8	6.8%	105	89.0%
Nambour	197	127	64.5%	-	-	56	44.1%	3	2.4%	68	53.5%
Gold Coast	229	156	68.1%	1	0.6%	45	28.8%	8	5.1%	104	66.7%
Rockhampton	162	71	43.8%	4	5.6%	24	33.8%	-	-	45	63.4%
Mackay	125	62	49.6%	1	1.6%	13	21.0%	10	16.1%	39	62.9%
Townsville	192	147	76.6%	2	1.4%	85	57.8%	11	7.5%	57	38.8%
Caixa	224	165	73.7%	1	0.6%	71	43.0%	35	21.2%	70	42.4%
Mount Isa	70	40	57.1%	-	-	15	37.5%	1	2.5%	24	60.0%
All Hospitals	2512	1791	71.3%	10	0.7%	612	33.6%	135	7.7%	1071	60.1%

* A record is in error if it has at least one coding error or a non coding error recorded.

** Percentage of the total records in error, which had at least one error recorded as being due to this reason.

Note that some records had more than one reason for error recorded. The main features are as follows:

- 1 non-compliance with Australian coding standards accounted for one in three records in error.
- 2 while not shown in the data, the majority of cases with 'Other' reasons for error related to incorrect selection of the code by coding staff.
- 3 while inadequate documentation accounted for only 7% of records in error, this was a much more specific problem for individual hospitals.

4.1.2 Unresolved cases

The team supervisor discussed individual cases with the hospital where the audit resulted in a DRG change. Two cases remain unresolved. In both cases the hospital and the audit supervisor agreed to refer the record to the NCCH. These cases were a known area of coding controversy and the specific resolution could not be found without further clarification. Both cases involved procedure codes for malignancies, one a gynaecological case and the other a gastrointestinal case, in which the NCCH had also requested examples.

4.2 Qualitative findings

A number of issues have been identified some of which can be pursued through the Queensland Coding Committee. Consequently we make the following recommendation:

Recommendation 1: The Queensland Coding Committee be used as a forum for hospitals to consider strategies and to exchange information on their experiences to address the following issues:

1. Coder education strategies (refer section 4.2.2)
2. Coder workforce issues (refer section 4.2.4)
3. Quality control procedures (refer section 4.2.8)

4.2.1 Compliance with Australian Coding Standards

The majority of DRG changes resulted from failure to apply certain Australian Coding Standards.

Recommendation 2: that each hospital reviews its current coding practices in relation to those standards where the audit identified problems with the application of those standards, and that the hospital provides coding staff with supplementary education regarding those standards.

Recommendation 3: The Department together with the Queensland Coding Committee review its coding guidelines for those coding standards and those DRGs where current coding practices are inadequate.

The main aspects of the Australian Coding Standards where there was a common problem within hospitals are summarised in the following sections. Appendix B contains the list of AN-DRGs and their associated error rates.

There is a range of other issues but these tended to be specific to individual hospitals and thus discussed in their individual reports.

There are several general standards that are of paramount importance to ensure accurate DRG assignment. These standards were not always correctly applied.

- **ACS 0001 PRINCIPAL DIAGNOSIS**

There were several cases where this standard was not coded correctly. This standard states that when a patient presents with a problem and the underlying condition is known, then assign the code for the problem as the principal diagnosis and the underlying condition as an additional diagnosis. For example, when a patient is admitted for treatment of secondary hypertension due to long-term polycystic renal disease, assign the secondary hypertension as the principal diagnosis and the polycystic renal disease an additional diagnosis.

Further, the standards require that where two conditions equally meet the definition of a principal diagnosis and no further clarification can be sought from the treating medical officer, the first condition mentioned is to be designated as the principal diagnosis.

- **ACS 0002 ADDITIONAL DIAGNOSES**

There was general overcoding of this standard. The second version of ICD-10-AM was introduced during the period from which cases were selected for audit. The second edition altered the way additional diagnoses should be coded i.e. only if diagnoses were treated during the admission or related to the principal diagnosis; not just because the patient had a condition, as was previously the case. The NCCH had confused the issue for the Coders because they conveyed that this did not change the coding practice, but clearly it did and the audit revealed that the Coders had not changed their practice. Conditions such as hypertension, were still being coded, and did not meet the definition of the standard.

- **ACS 0031 ANAESTHESIA**

The problems with this standard varied from Coders not coding sedation for some procedures at one hospital; double coding of sedation and regional anaesthetic codes instead of one code at another hospital; coding of infusions instead of injections for spinal and epidural anaesthesia; Coders not being able to read the anaesthetic chart to determine if a GA or just sedation was performed.

Part of the problem was the lack of guidance initially with the introduction of the ICD-10-AM First Edition, and hospitals made their own decisions on interpreting this standard by consulting their Anaesthetic departments. Advice given varied between

hospitals. Most of the problems highlighted in the audit will be rectified with the introduction of ICD-10-AM Third Edition from July 1, 2002.

- **ACS 0401 DIABETES MELLITUS**

There were three issues with Diabetes:

- 1 Not coding additional diagnoses in relation to diabetic manifestations where the Diabetes code was correctly identified, but the additional diagnosis to capture the condition as the result of the manifestation was not identified. eg. Diabetic nephropathy and conditions stated such as Chronic Renal failure not being coded as an additional diagnosis;
- 2 not coding insulin resistance cases as per the standard; and
- 3 incorrect coding of microvascular complications as per the standard.

There needs to be further follow-up at the hospital level with the coding of Diabetes to ensure these cases are correctly coded.

- **ACS 1521 CONDITIONS COMPLICATING PREGNANCY**

All hospitals that had obstetric cases in the audit sample had problems with the coding of these cases. The two main reasons for this were:

- 1 the lack of direction with both the manual index and the Encoder software; and
- 2 trying to determine, depending on the gestational stage of the pregnancy, whether the pregnancy was being treated or just the condition causing the admission during pregnancy.

There are several ways that these conditions can be coded:

- condition code not having an effect but occurring in the pregnancy eg. Fractured arm at 16 weeks pregnant (coded as fractured arm with incidental pregnancy code);
- condition not related to the pregnancy causing a problem in the pregnancy eg. Anaemia (coded as O99.x complication in pregnancy with anaemia code); and
- conditions directly related to the pregnancy eg. Gestational hypertension (has its own code in the pregnancy chapter)

A few examples that were causing confusion included:

Example 1: patient in motor vehicle accident at 34 weeks, where the patient would probably be admitted because of the gestational age of the pregnancy, but difficult

to determine if the pregnancy was actually being treated. The two coding scenarios could be:

- injury code S00-T98 and incidental pregnancy code (injury DRG); or
- O99.x complications of pregnancy code with injury code (obstetric DRG).

Example 2: patient admitted with diarrhoea at 27 weeks, admitted to general ward with gastrointestinal specialist in charge of case. The two coding scenarios could be:

- diarrhoea code with incidental pregnancy code; or
- O99.x complication of pregnancy code with diarrhoea code.

In the above example, the Coders are often guided by where the patient is admitted to and the specialty of the treating Clinician in assigning the correct codes:

Example 3: Patient is admitted with ligamentous pain at 30 weeks. This is a pregnancy related condition, but there is no way of getting to the correct code of O26.88, because the manual index and Encoder cannot get you there. This means that the Coder needs to "tabular browse" which is a non routine navigation to assign a code and not acceptable coding practice. Depending on the code allocated by the Coder, it could either be O99.x (Other maternal diseases classifiable elsewhere but complicating pregnancy, childbirth and the puerperium) followed by a condition code or O26.88 *Other specified pregnancy-related condition* (which in this case, is the most likely code). The issue is that a DRG change can occur depending on the pathway the Coder takes and the code ultimately assigned.

In the case of the Royal Women's' hospital, the coding issue is determined by how many weeks gestation the patient is. For example, if the patient presents to the RBH Accident & Emergency Department and is only 16 weeks pregnant and has a car accident, then the coding would be an injury code, with an incidental pregnancy code. If that same patient were 34 weeks pregnant, then they would be sent straight to RWH. The dilemma for the Coder is does this mean the pregnancy is being treated, or is it just a precaution because they are 34 weeks pregnant.

For this example this could be:

- an O99 code to indicate a complication in the pregnancy followed by an injury code;
- an O26.88 code (other pregnancy related condition) followed by an injury code;

There was debate about whether the patient was actually having the pregnancy treated, or the fact they were probably admitted because of the pregnancy, especially if the gestation was at a latter stage. Eg. 34 weeks gestation. The use of injury codes can lead to an injury DRG.

These issues should be reviewed by the Queensland Coding Committee (to consider the coding scenarios illustrated above), National Centre for Classification in Health (to clarify the national coding standard) and 3M Australia (to review the Encoder software in light of the issues discussed above).

- **ACS 1905 CLOSED HEAD INJURY/LOSS OF CONSCIOUSNESS/CONCUSSION**

There were problems with the interpretation of and the correct coding of head injuries. This occurred in all hospitals where these cases were selected for audit. The standard states that if a cause for the head injury is known, such as haemorrhage, then this is the code to use and to avoid using *S09.9 Unspecified Injury of Head*. Coders were coding the laceration as the cause of the head injury in interpreting this standard. A skin laceration would not cause the head injury, and there was often not a cause given, therefore the only option is to use the S09.9 code, which more correctly captures the reason for admission.

Admission times were difficult to find in the record and this can be used as an indication of treatment of a head injury. For example if a patient was admitted with just a laceration which was sutured, the audit showed that they would be admitted to an observation ward for a few hours post procedure. A patient with a laceration and a suspected head injury usually has neurological observations and will stay in for a much longer period of time, even overnight. Therefore there is a reliance on establishing the admission and discharge times. The implications are that it has a bearing on the coding of head injuries, of which there were several DRG changes.

- **ACS 1907 MULTIPLE INJURIES**

In cases of multi-trauma selected for audit, Coders were using a multiple injuries code instead of coding each individual injury to a specific site. It was obvious that Coders were not aware that the multiple site codes are only used when there are excess codes, and only one code can be used to capture information about the injury. This would rarely occur.

4.2.2 Coder education and support

There was a lack of structured coding education in many hospitals, especially one that provided the opportunity for coders to focus on known areas of coding difficulty and one that also allowed for clinician input. There was often no opportunity for the coding staff to give and receive feedback on coding issues with the medical staff. This kind of two-way interaction with clinical staff would highlight the need for quality documentation for coding and the specificity that is required. Further, coding staff in rural hospitals had some but not an adequate level of professional support. This isolation contributed to errors in those hospitals.

A number of strategies could be considered by hospitals including:

- a mentoring program for less experienced coders and for rural and regional hospitals;
- forums that enable coding staff to discuss known areas of coding difficulties. Individual hospitals could use such forums to address the findings of this audit and particularly non-compliance of coding standards which could be included into any future education process;
- as a strategy to deal with the over-reliance on Encoder pathways and terms selected by Coders, hospitals could instigate an induction program where all new coders do the following:
 - code based solely on coding manuals for a specified time;
 - code all specialties starting from the lowest complexity of cases and moving to the higher levels of casemix as their experience warrants; and
 - establish a mentor program for less experienced coders.

We note that a system of coder competency had been developed by the Princess Alexandra Hospital, which determined degrees of difficulty coding in various specialties, incorporating a step-by-step process. The coder had to prove proficient in a specialty level before advancing to the next specialty level. The hospital is to be commended on initiation of this process and it is something that could be used in other hospitals.

The Queensland Coding Committee is a useful forum for hospitals to discuss each other's practices and experiences with strategies to maintain and enhance coding staff knowledge and competency. The Committee is also a forum to consider options for mentoring programs across hospitals particularly for areas of specialisation where the professional expertise tends to be concentrated in one or two hospitals.

Recommendation 4: that individual hospitals enhance their current Coder education and support activities to ensure that:

- there is a structured and on-going education program for Coders, which includes interpretation of coding standards and clinical information to ensure accurate coding;
- there are coder forums that incorporate coding education, casemix and documentation issues to improve consistency between Coders and understanding of all specialties;

- coding and interpretation of the Australian Coding Standards is consistent amongst all Coders in regards to head injuries and obstetric complications; and
- Coders have clinical education sessions by the medical staff at their hospital.

4.2.3 Clinician engagement

Two issues arose from qualitative feedback from auditors. Firstly, there were many cases where coders needed to obtain clarification from clinicians without which coding errors would result. In some cases, coding staff would deduce or make assumptions about the clinical specificity based on for example, the treating unit or the nature of the treatment. This practice is contrary to Australian standards.

Secondly, there is opportunity for hospitals to have more input from clinicians to the coding program and coder education activities. This would help to improve clinician understanding of casemix coding issues and of specific areas of coding where clinical specificity can impact on DRG assignment.

It is important to ensure that there is effective clinician input to coding practices particularly for clinicians to provide coding staff with information on changes to clinical terminology and emerging procedures and therapies.

Recommendation 5: individual hospitals review and promote increased clinician input to coding practices particularly for clinicians to provide coding staff with information on changes to clinical terminology and emerging procedures and therapies.

4.2.4 Coder Workforce Issues

Several hospitals have had a large staff turnover with some having encountered this problem during the period from which the cases were selected for audit and thus had an impact on their audit result. This is a problem not unique to Queensland hospitals. Nevertheless, hospitals need to consider strategies to reduce the extent and the impact of the problem. For example, the Princess Alexandra hospital is developing a career pathway to retain coding staff. Other hospitals provide staff with broader roles to aid in their professional development.

The Queensland Coding Committee is a useful forum for hospitals to discuss practices and experiences with staff retention strategies as per the previous recommendation for coder education (section 4.2.32).

4.2.5 Emergency Department Admissions

A number of coding problems were identified associated with admissions through the Emergency Department. The underlying issue facing coding staff that results in variability in coding practice relates to whether or not to code events that occur as part of the hospital episode of care but prior to the admission component of that episode of care (i.e., prior to the recorded time of admission). This is compounded more by inadequate documentation of the time of admission and variability in practice in determining time of admission. A related but separate issue is what appears to be variability in admission practices across hospitals for patients who present at emergency departments. Each of these issues is considered in the following sections.

4.2.5.1 Coding of Emergency Admissions

There is variability in practice across hospitals in their coding of events that occur as part of the hospital episode of care but prior to the actual time of admission. There is also variability within hospitals across coding staff with some not coding pre-admission events (that occur in the same episode of care) and others coding all treatment and conditions that are treated prior to the actual commencement of the admission.

There is conflicting information within the Queensland Hospital Admitted Patient Data Collection (QHAPDC), which has lead to confusion in coding of Emergency Admissions. Under 4.4 Same Day Patients (pg 403), point 7 states:

"Non-admitted (emergency/outpatient) services provided to a patient who is subsequently classified as an admitted patient shall be regarded as part of the admitted episode. Any occasion of service should be recorded and identified as part of the admitted patient's episode of care."

This would seem to contradict advice given from the QHAPDC on page 904 under 9.5 Procedure, second paragraph, which states:

"All significant procedures undertaken from the time of admission to the time of discharge should be coded. This includes diagnostic and therapeutic procedures. Also include any procedures that were performed under contract at another hospital and use the contract flag to identify whether they were performed on an admitted or non-admitted basis".

Recommendation 6: Queensland Department of Health review and clarify existing guidelines for coding diagnoses and procedures that relate to Emergency Department attendances when patients are subsequently admitted.

4.2.5.2 Recording of admission time

There are two related issues, namely, there is inconsistency in practices in electing time of admission and poor documentation of time of admission. Discussions with hospital staff revealed that there is significant variability in practice amongst clinicians in electing the time of admission.

Admission time is difficult to determine and often cannot be found in the record, therefore the procedures performed in the Emergency Department may not be coded and it is difficult to determine if they form part of the admission.

Time spent in the Emergency Department can assist Coders in determining the correct principal diagnosis for specific aspects of coding, eg. Head injury where you would expect a longer time spent at the hospital with Neurological observations etc. performed, rather than just a routine few hours observation after suturing of a laceration.

4.2.5.3 Admission source

During the audit, hospitals reported that they wanted a definitive definition of what constitutes an admission through the Emergency Department. It was noted that depending on the hospital, the Emergency Department was used after hours, had observations and even day wards, and in some cases were conducting minor elective procedures. This was particular evident in the review of short stay admission cases (refer to section 5.2).

Recommendation 7: the Department clarifies its guidelines regarding designation of admission source for patients who are treated in Emergency Departments in cases where the patient is not an emergency presentation but where the ED is being used as an elective treatment facility.

4.2.6 Documentation issues

There were many examples of hospitals with good documentation practices. This is reflected in the finding that only 7% of records with a coding error were due to inadequate documentation. However, there were three hospitals where this was not the case. Where coding errors resulted from inadequate documentation, a related issue pertains to educating Clinicians on what to list as the principal diagnosis. For example, in many cases of diabetes, there are multiple conditions from which to select the principal diagnosis.

ACS 0001 *Principal Diagnosis* states that where there are two or more interrelated conditions, each potentially meeting the definition for principal diagnosis, the

Clinician should be asked to indicate which diagnosis should be the principal. If no further information is available, then the first mentioned diagnosis is coded as the principal diagnosis. Inadequate documentation becomes an issue in such a case and can affect DRG assignment unless the coder seeks clarification from a Clinician. In many such cases, coders chose to code without referring the matter to a Clinician and in other cases, did not document the outcomes of that confirmation in the medical record (verbal or fax confirmation).

The Auditors generally found the discharge summaries at most facilities very informative. However, an important issue with documentation was when there was conflicting documentation in the record, and conflicting documentation from different Clinicians. For example, the Registrar had completed the discharge summary containing clinical information that varied from the notations of the responsible Specialist. In cases such as respiratory conditions, eg, Chest infection versus Pneumonia, this can cause DRG change. Coders were unsure as to the hierarchy structure and which information they should be consulting to best reflect the overall treatment of the patient in the medical record. Hospitals should ensure that they have a policy regarding such matters and that this is communicated to coders and clinicians.

Recommendation 8: that hospitals clarify their policy regarding clinician responsibility for medical record documentation and that this is communicated to clinicians and coding staff.

4.2.7 Administration Issues

4.2.7.1 Encoder

The Encoder is an extremely useful tool to assist Coders in code assignment. However the auditors found that in facilities with predominantly inexperienced Coders, often the eventual codes produced by the Encoder were not being questioned by the Coder. Sometimes the incorrect lead term was being input by the Coder because of a lack of experience with the coding books, and the Coder automatically accepted the codes given by the Encoder.

As discussed in the sections 4.2.2 "Coder education and support" hospitals should consider a "lead-in" time, where the Coder uses the manual books for a specified time, before moving to the Encoder. This may allow the Coder to recognise occasions to question the Encoder results, and should assist Coders with selecting the appropriate lead terms, thereby maximising the benefits of using the Encoder.

4.2.7.2 Auto coding of Renal Dialysis Patients

The coding of renal dialysis patients is automated in most hospitals, a practice that in itself not an issue and is important for coding productivity. An issue arose during the audit regarding patients presenting to the dialysis unit, but not primarily for renal dialysis, for example, peritoneal dialysis patients. There were occasions when these patients were being treated in the dialysis unit for conditions relating to the their dialysis, and presenting for investigations and monitoring of these conditions. Therefore the principal diagnosis changes, as well as the DRG of the patient being treated. However, they were being encoded (automatically) because they were being treated in the dialysis unit. The extent of the problem is not known, but could be significant given the large number of admissions to dialysis units.

Recommendation 9: that hospitals review their auto coding practice with a view to either modify their auto coding software to ensure that such cases are identified for review or modify practices such that only 'straight forward cases' are flagged for auto coding.

4.2.8 Quality control procedures

Hospitals employed a range of quality review and quality control practices. Often however, they did not have a sufficiently structured quality control program. The consequences of this are evident in the audit results whereby easily detectable errors had not been noticed by staff (eg auto coding errors). A structured program would focus on known areas of coding difficulty, case types where clinical specificity or lack thereof could impact DRG assignment and computerised, manual and documentation processes that could impact on coding integrity. This would provide forums for coding staff and clinicians to consider coding quality issues. While there are always time restraints to conduct these types of activities, a more structured quality control process would improve the integrity of the medical record and improve the quality of casemix information. The Queensland Coding Committee is an ideal forum for hospitals to exchange information on innovative approaches to quality control practices and procedures.

5 Review findings

The Department did not require an analysis of the results of the two process reviews as it is undertaking the analysis of the raw data. However, we provide summary data and make a number of observations regarding both reviews.

5.1 Booked surgical cases review

5.1.1 Approach

This aspect of the review considered cases where the hospital data indicated the patient was an elective (waiting list) case admitted through the emergency department. The total population size of the cases that met the Department's criteria for selection varied and for many hospitals is relatively small, such that caution is required when interpreting the results for these hospitals. A random sample of cases were selected by the Department except for those hospitals that had small population size, in which case all admissions were selected for review.

Each admission was allocated to one of six categories using a decision-making hierarchy (refer Appendix C). The six categories are as follows:

- A. Episodes where there were no formal Emergency Department notes within the record.
- B. Episodes with no medical officer notation regarding waiting list procedure and no procedure was performed in relation to reason for admission
- C. Episodes with no medical officer notation regarding waiting list procedure and where a condition requiring treatment was diagnosed during admission; in which case the following additional information was documented:
 - i. all procedures match the Reason For admission;
 - ii. elective status possibly incorrect;
 - iii. inadequate documentation re the booking procedure;
- D. Episodes with medical officer notation regarding waiting list procedure but the patient was not treated as an emergency.
- E. Episodes with medical officer notation regarding waiting list procedure and procedure was undertaken in response to an emergency situation.
- F. Episodes with no medical officer notation regarding waiting list procedure
Episodes with a medical officer notation but not able to determine nature of circumstances.

5.1.2 Comment on the methodology

There a number of observations regarding the methodology that need to be noted both in interpreting the data and for future reference if the study were to be repeated.

Category A: was selected if there were no formal ED notes within the medical record with the presumption that this indicated an incorrect admission source. The reviewer was then required to indicate the correct admission source. While, this was 'true' for many cases, there were other cases where the patient was treated in the ED as an elective. That is, where the ED was used as a facility to treat an elective patient, particularly in regional hospitals. In such cases, it could also be argued that the ED was not the admission source as it was simply a facility that was being used instead of a sameday clinic or outpatient rooms.

Category B: tended to reflect situations where, as for Category A, the ED was being used for minor procedural work for elective patients, but unlike Category A, there were formal ED notes (in that the ED sheet was used for documentation of the procedural work, not because the patient was an emergency case).

Category C: comprised two case types. Firstly, patients admitted as an emergency for which a procedure was performed in relation to the reason for admission (eg patient was admitted with a fracture with a procedure of fracture reduction). Secondly, patients who presented to the ED in relation to a booked procedure where the underlying condition had progressed to the point that necessitated an emergency admission and for which the booked procedure was then performed. Such cases were classified as Category C if there was no documentary notation in the record of the booked procedure.

Category D: consisted predominantly of cases where the ED was being used for elective minor procedural work. Such cases where the medical record did not include ED notes, were classified to Category A and cases with ED notes but without any reference to the procedure being a booked procedure were classified to Category B.

Category E: consisted almost entirely of cases where a patient on a booking list was admitted in an emergency situation for the condition relating to the procedure, and the procedure was performed. This differs to some of the cases in Category C as in this case, the medical record included notation of the procedure being a booked procedure.

Category F: as expected, there were no such cases but this category was included to exhaust all options in the classification taxonomy.

5.1.3 Overview of the results

The following table provides an overview of the statistical results for the review of booked surgical cases.

Table 4: Results of the review of booked surgical cases

Hospital	Case type						Total
	A	B	C	D	E	F	
Prince Charles	1	0	5	0	1	0	7
Royal Brisbane	7	0	4	0	0	0	11
Royal Children's	4	0	0	0	0	0	4
Royal Women's	4	0	0	0	1	0	5
Princess Alexandra	16	0	78	0	2	0	96
Ipswich	7	0	1	0	0	0	8
Nambour	25	0	4	1	0	0	30
Gold Coast	16	0	0	0	3	0	19
Rockhampton	2	0	0	56	0	0	58
Mackay	91	1	6	2	0	0	100
Townsville	11	0	4	2	1	0	18
Cairns	3	0	3	0	0	0	6
Mount Isa	12	23	0	28	0	0	63
Total	199	24	105	89	8	0	425

The main features of this data are as follows:

- 1 A total of 425 cases were reviewed (out of a population of 574 cases that met the criteria for review), ranging between hospitals from 4 to 156 cases.
- 2 Approximately 46% of cases did not have formal emergency department notes in the medical record (i.e., Category A); this varied from 17% to 91% (excluding hospitals with small sample sizes).
 - for some cases this reflected an incorrect admission source (i.e. the patient was not admitted through the emergency department);
 - for remaining cases, the patients were treated in the Emergency Department but there were no formal Emergency Department notes primarily as the patients were not an emergency but the ED facility was being used for minor procedural surgery such as excision of skin lesion, or for medical diagnostic cases such as CAT scan; this occurred primarily in regional centres.
- 3 Approximately 44% of all cases reviewed did not have any documentation in the medical record that the patient was on the waiting list (i.e. Category B and C), indicating either a documentation problem or that the admission type was not

correct. This varied from 7% to 81% (excluding hospitals with small sample sizes).

An issue arose that is outside the scope of the project (and thus no quantitative information is available) but where auditors proffered their observation as follows:

- there appears to be both a documentation problem in some hospitals and inconsistency in approach across hospitals with respect to 'elective' patients who are treated in the Emergency Department with some hospitals recording the admission source as the Emergency Department when it is merely the location of care (eg in regional hospitals where GPs use the facility to undertake minor surgery on public hospital patients).

Table 5 Category 'C' case types

<i>Hospital</i>	<i>Response</i>				<i>Total</i>
	<i>All procedures match RFA</i>	<i>Elective Status possibly incorrect</i>	<i>Inadequate Documentation</i>	<i>Other</i>	
Prince Charles	5	0	0	0	5
Royal Brisbane	1	3	0	0	4
Royal Children's	0	0	0	0	0
Royal Women's	0	0	0	0	0
Princess Alexandra	5	73	0	0	78
Ipswich	1	0	0	0	1
Nambour	3	1	0	0	4
Gold Coast	0	0	0	0	0
Rockhampton	0	0	0	0	0
Mackay	6	0	0	0	6
Townsville	4	0	0	0	4
Cairns	3	0	0	0	3
Mount Isa	0	0	0	0	0
Total	28	77	0	0	105

5.2 Short stay emergency admissions review

This aspect of the review considered short stay emergency department admissions. The total population size of the cases that met the Department's criteria for selection varied and for many hospitals is relatively small such that caution is required when interpreting the results for these hospitals. A stratified sampling frame was used by the department with a random sample of cases selected from strata defined by the length of stay (in hours) in hospital as follows:

- ≤ 1 hour
- $1 < \text{LOS} \leq 2$ hours
- $2 < \text{LOS} \leq 4$ hours
- $4 < \text{LOS} \leq 8$ hours
- > 8 hours.

Four factors were assessed in this review as follows:

- 1 Documentation of authority to admit the patient, and where such documentation existed whether or not it was authorised by a medical officer.
- 2 For all cases, whether there was documentation of at least one of the specified clinical characteristics (see Appendix D).
- 3 For all cases, whether the reason for presentation related to one of three factors: wound dressing/review; Plaster change/review; or Psychiatric condition.
- 4 For all cases, whether one of the following applied: patient transferred in from another hospital; patient transferred out to another hospital; patient died in ED.

The following tables provide an overview of the statistical results for the review of short stay emergency department cases.

The main features of this data are as follows:

- a total of 1110 cases were reviewed (out of a population of 6862 cases that met the criteria for review), ranging between hospitals from 7 to 104 cases with one hospital having no cases that met the criteria for review.
- approximately 79% of the short stay emergency department admissions contained at least one of the specified clinical indications noted in the medical record (refer to Appendix D for the list of the indicators). This varied from 13.3% to 100% across the hospitals included in the review with all but one hospital having at least two thirds of cases matching one of the clinical indicators.
- many of the medical records had no documentation of authority to admit the patient (62%). This varied from 100% to 14% of cases with no formal documentation.

An issue arose that is outside the scope of the project (and this no quantitative information is available) but where auditors proffered their observations as follows:

- there is considerable variation in admission practices across hospitals for patients who present to the Emergency Department; we are not questioning these practices, as a decision to admit short stay patients can be dependent on many factors including options available to the hospital to manage the patient, clinician experience and the perceived risk of not admitting a patient.

Table 6: Documentation of authority to admit

<i>Hospital</i>	<i>Population size</i>	<i>Records reviewed</i>	<i>Notation to admit*</i>	<i>% of sample</i>	<i>Admission authorised**</i>	<i>% of those with notation</i>
Prince Charles	7	7	2	28.6%	2	100.0%
Royal Brisbane	2,140	99	69	69.7%	69	100.0%
Royal Children's	162	102	50	49.0%	50	100.0%
Royal Women's	-	-	-	-	-	-
Princess Alexandra	101	97	83	85.6%	83	100.0%
Ipswich	365	102	12	11.8%	12	100.0%
Nambour	376	99	26	26.3%	19	73.1%
Gold Coast	198	95	32	33.7%	29	90.6%
Rockhampton	1,190	104	1	1.0%	1	100.0%
Mackay	1,434	104	-	-	-	-
Townsville	355	102	70	68.6%	70	100.0%
Cairns	306	101	73	72.3%	67	91.8%
Mount Isa	228	98	7	7.1%	4	57.1%
<i>Total</i>	<i>6,862</i>	<i>1,110</i>	<i>425</i>	<i>38.3%</i>	<i>406</i>	<i>95.5%</i>

* Record contains a notation to admit the patient.

** The notation to admit has been authorised by a Medical Officer.

Table 7: Documentation of specified clinical characteristics

Hospital	Records reviewed	No indicators	% of sample	At least one indicator	% of sample	Invasive diagnostic investigations	Continuous observations / management	Invasive procedures	IV fluids or antibiotics	Post procedural observation	Other significant factors
Prince Charles	7	-	-	7	-	1	-	6	1	-	-
Royal Brisbane	99	1	1.0%	98	99.0%	75	12	2	5	-	4
Royal Children's	102	33	32.4%	69	67.6%	15	28	26	-	-	-
Royal Women's	-	-	-	-	-	-	-	-	-	-	-
Princess Alexandra	97	3	3.1%	94	96.9%	37	39	11	6	-	1
Ipswich	102	24	23.5%	78	76.5%	7	5	67	2	-	-
Nambour	99	29	29.3%	70	70.7%	22	4	42	3	-	-
Gold Coast	95	6	6.3%	89	93.7%	34	18	32	3	-	2
Rockhampton	104	32	30.8%	72	69.2%	-	1	71	-	-	-
Mackay	104	21	20.2%	83	79.8%	-	-	83	-	-	-
Townsville	102	3	2.9%	99	97.1%	17	59	9	13	-	1
Cairns	101	-	-	101	-	35	30	27	9	-	-
Mount Isa	98	85	86.7%	13	13.3%	1	-	12	-	-	-
Total	1,110	237	21.4%	873	78.6%	244	196	388	42	-	8

Table 8: documentation of specified reasons for admission

<i>Hospital</i>	<i>Records reviewed</i>	<i>Wound dressing/review</i>	<i>% of sample</i>	<i>Plaster change/review</i>	<i>% of sample</i>	<i>Psychiatric condition</i>	<i>% of sample</i>
Prince Charles	7	-	-	-	-	-	-
Royal Brisbane	99	-	-	-	-	3	3.0%
Royal Children's	102	-	-	-	-	-	-
Royal Women's	-	-	-	-	-	-	-
Princess Alexandra	97	-	-	-	-	18	18.6%
Ipswich	102	6	5.9%	-	-	-	-
Nambour	99	-	-	-	-	-	-
Gold Coast	95	-	-	-	-	4	4.2%
Rockhampton	104	-	-	-	-	-	-
Mackay	104	1	1.0%	-	-	-	-
Townsville	102	-	-	-	-	1	1.0%
Cairns	101	1	1.0%	-	-	-	-
Mount Isa	98	1	1.0%	-	-	-	-
<i>Total</i>	<i>1,110</i>	<i>9</i>	<i>0.8%</i>	<i>-</i>	<i>-</i>	<i>26</i>	<i>2.3%</i>

Table 9: Other characteristics of the admission

<i>Hospital</i>	<i>Records reviewed</i>	<i>Patient transferred in</i>	<i>% of sample</i>	<i>Patient transferred out</i>	<i>% of sample</i>	<i>Patient died</i>	<i>% of sample</i>
Prince Charles	7	1	14.3%	-	-	4	57.1%
Royal Brisbane	99	1	1.0%	1	1.0%	-	-
Royal Children's	102	-	-	-	-	-	-
Royal Women's	-	-	-	-	-	-	-
Princess Alexandra	97	1	1.0%	1	1.0%	4	4.1%
Ipswich	102	-	-	3	2.9%	1	1.0%
Nambour	99	-	-	-	-	-	-
Gold Coast	95	1	1.1%	9	9.5%	10	10.5%
Rockhampton	104	-	-	-	-	-	-
Mackay	104	-	-	-	-	-	-
Townsville	102	1	1.0%	1	1.0%	-	-
Cairns	101	2	2.0%	2	2.0%	-	-
Mount Isa	98	-	-	1	1.0%	1	1.0%
<i>Total</i>	<i>1,110</i>	<i>7</i>	<i>0.6%</i>	<i>18</i>	<i>1.6%</i>	<i>20</i>	<i>1.8%</i>

Appendix A: Sampling details

Table 10: Sample sizes

Hospital	Total Coding Sample	Over-sample (proportion)	Minimum Target	Cases audited	Total Elective Sample	Total Elective Charts	Cases audited	Total Emergency 'Sample'	Total Emergency Charts	Cases audited	Total cases	Target	Variance
REH	432	0.20	360	371	11	11	11	101	2140	99	481	472	9
TPCH	214	0.20	178	201	7	7	7	7	7	7	215	182	23
PAH	336	0.15	344	342	100	155	99	101	101	97	595	545	-10
Gold Coast	251	0.15	218	223	22	22	22	103	198	95	343	343	0
Moray	126	0.15	110	125	100	117	100	104	1434	104	333	314	15
Narbour	210	0.15	183	197	32	32	30	103	375	99	325	318	8
Cairns	248	0.20	207	224	7	7	6	102	303	101	331	316	15
Townsville	212	0.20	177	192	19	19	18	102	355	102	312	288	14
ROH	136	0.15	118	120	4	4	4	103	162	102	283	225	1
RWH	113	0.20	94	105	8	8	5	0	0	0	110	99	11
Ipswich	184	0.20	153	174	8	8	8	102	355	102	284	263	21
Rockhampton	162	0.15	141	152	58	58	53	104	1190	104	324	303	21
Mt Isa	71	0.20	59	70	64	64	63	103	228	98	231	226	5
Total	2756		2342	2512	437	508	425	1135	6852	1110	4047	3914	133

Notes:

- 1 The Department set a minimum sample target for each hospital for the coding audit and then over-sampled from the target population to allow for cases where the medical record may not be available at the time of the audit.
- 2 The actual number of cases audited exceeded the minimum target in all cases. Whereas, for the two reviews, not all selected cases were audited because of the unavailability of medical records at the time of the review.

Appendix B: DRG Profile of targeted sample

The following tables provide a summary DRG profile of the case types selected for the coding audit.

Table 11: DRG profile of cases selected for the coding audit and DRG error rates

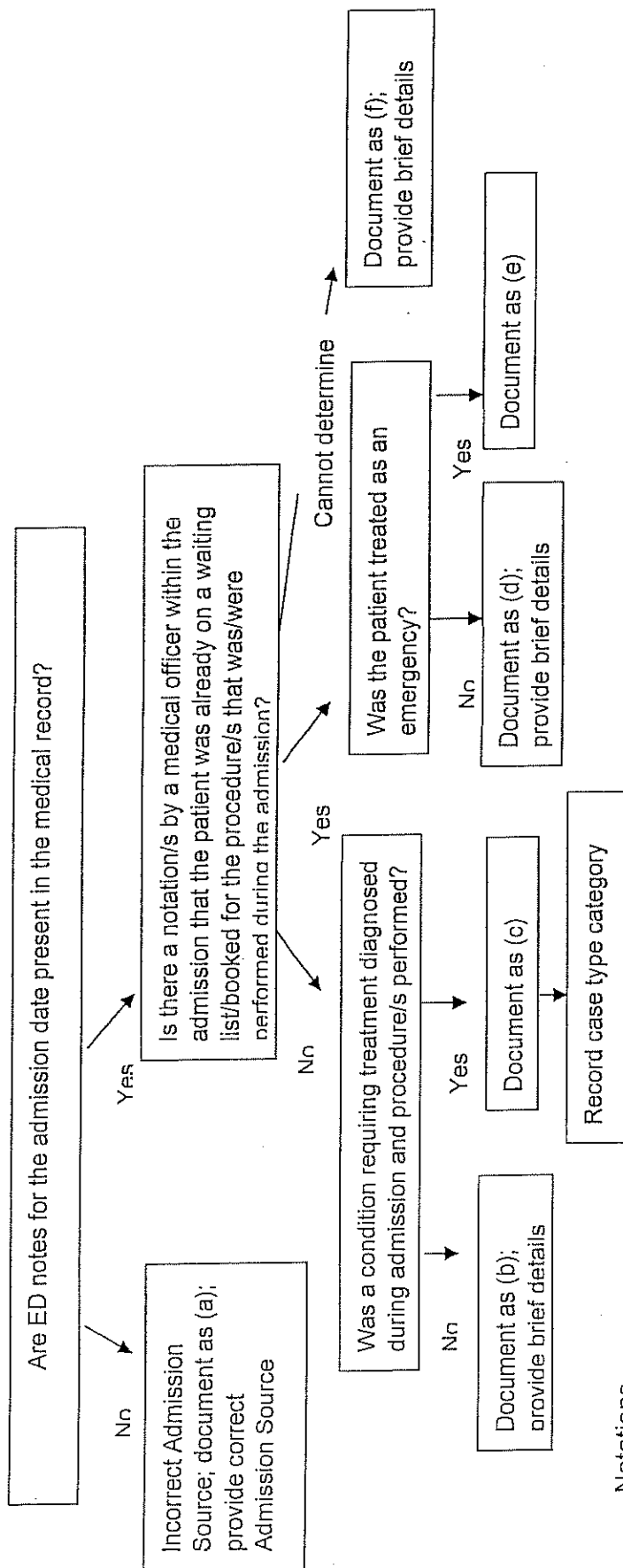
<i>Original DRG</i>	<i>Records audited</i>	<i>DRG errors</i>	<i>% in error</i>
I74C	149	7	4.7%
L67C	142	26	18.3%
O65B	141	21	14.9%
F74Z	133	12	9.0%
X60C	132	29	22.0%
F65B	93	13	14.0%
I75C	91	11	12.1%
F42B	86	6	7.0%
M02B	75	8	10.7%
O65A	68	8	11.8%
E69C	67	6	9.0%
R61B	65	14	21.5%
G66B	64	14	21.9%
I68B	61	11	18.0%
D60B	57	16	28.1%
G66A	51	18	35.3%
J11Z	45	4	8.9%
W01Z	43	1	2.3%
J64B	42	3	7.1%
K60B	38	4	10.5%
O01D	36	3	8.3%
B67B	30	3	10.0%
G02A	30	4	13.3%
E62C	29	5	17.2%
F42A	28	2	7.1%
Y02B	28	2	7.1%
O60D	25	1	4.0%
F04A	23	3	13.0%
E67C	22	3	13.6%
F06B	22	3	13.6%
D63B	21	4	19.0%
O01B	21	2	9.5%
Y62B	21	1	4.8%
E60A	20	1	5.0%
I75B	20	5	25.0%

Original DRG	Records audited	DRG errors	% in error
H64B	19	3	15.8%
R60C	19	11	57.9%
D67Z	18	-	-
G44C	18	2	11.1%
K60A	17	3	17.6%
O01A	17	3	17.6%
O01C	17	3	17.6%
O60B	17	1	5.9%
T61A	17	11	64.7%
O60A	16	3	18.8%
E62B	15	6	40.0%
F75C	15	8	53.3%
G70A	15	4	26.7%
I03C	15	1	6.7%
I08A	15	2	13.3%
O60C	15	4	26.7%
I73C	14	2	14.3%
N10Z	13	2	15.4%
T60A	13	4	30.8%
F65A	8	6	75.0%
N62B	8	-	-
E75C	7	2	28.6%
E62A	6	3	50.0%
I68C	6	3	50.0%
E75B	5	2	40.0%
I03B	5	-	-
I68A	5	-	-
O40Z	5	-	-
E69B	4	1	25.0%
F75B	4	3	75.0%
I26Z	4	-	-
I75A	4	-	-
D11Z	3	-	-
G07B	3	-	-
I04B	3	-	-
J08B	3	1	33.3%
J67B	3	-	-
Z40Z	3	1	33.3%
B02C	2	-	-
D08Z	2	1	50.0%
D13Z	2	-	-
E69A	2	-	-
E75A	2	-	-
F06A	2	-	-

Original DRG	Records audited	DRG errors	% in error
F08B	2	-	-
F14C	2	-	-
G01B	2	1	50.0%
G02B	2	2	100.0%
G04A	2	-	-
G08Z	2	-	-
G11B	2	-	-
G44A	2	2	100.0%
G44B	2	1	50.0%
H01A	2	-	-
I73A	2	2	100.0%
I73B	2	-	-
J10Z	2	-	-
L41Z	2	-	-
L63C	2	2	100.0%
L64Z	2	-	-
R60A	2	-	-
R61A	2	-	-
X60A	2	2	100.0%
X60B	2	-	-
A06Z	1	-	-
A41Z	1	-	-
B03A	1	1	100.0%
B04A	1	-	-
C03Z	1	-	-
C04Z	1	-	-
C08Z	1	-	-
C10Z	1	-	-
D04B	1	-	-
D09Z	1	-	-
D40Z	1	-	-
D66B	1	-	-
E02A	1	-	-
E02B	1	-	-
F05A	1	1	100.0%
F08A	1	-	-
F11A	1	-	-
F75A	1	-	-
G05B	1	-	-
H01C	1	1	100.0%
I03A	1	1	100.0%
I09B	1	-	-
I10A	1	-	-
I10B	1	-	-

<i>Original DRG</i>	<i>Records audited</i>	<i>DRG errors</i>	<i>% in error</i>
I12A	1	-	-
I12B	1	1	100.0%
I19Z	1	-	-
I20Z	1	-	-
I22Z	1	-	-
I23Z	1	-	-
K01Z	1	-	-
K06Z	1	-	-
K64B	1	-	-
L07B	1	-	-
M02A	1	1	100.0%
M03B	1	-	-
M04A	1	-	-
N03A	1	1	100.0%
N03B	1	-	-
N04Z	1	-	-
N05B	1	-	-
N09Z	1	-	-
O04Z	1	-	-
Q01Z	1	-	-
U67Z	1	1	100.0%
X06B	1	-	-
Y02A	1	1	100.0%
<i>Total</i>	<i>2,512</i>	<i>391</i>	<i>15.6%</i>

Appendix C: Methodology for surgical case review



Notations

- (a) episodes with incorrect Admission Source (summary of correct Admission Source codes);
- (b) episodes with no medical officer notation; brief details;
- (c) episodes where a condition requiring treatment was diagnosed during admission; procedure/s performed; indicate which of the following best characterises the case:
 - i. All procedures match the Reason For admission;
 - ii. Elective status possibly incorrect;
 - iii. Inadequate documentation re the booking procedure;
 - iv. Other.
- (d) episodes with a medical officer notation; brief details;
- (e) episodes with a medical officer notation; patient treated as emergency;
- (f) details of other episodes.

Appendix D: Methodology for short stay emergency admissions review

The auditor was asked to answer the following questions for each such case:

- 1(a) Does the clinical documentation for the presentation date include a notation to 'admit' the patient? **Y/N**
- 1(b) Is the notation authorised by a medical officer? (signature at the end of the entry). **Y/N/ Not applicable**

2. Is there a documented indication of any of the following?

- (a) Invasive diagnostic investigations **Y/N**
- (b) Continuous observations/management **Y/N**
- (c) Invasive procedures **Y/N**
- (d) IV fluids or IV antibiotics **Y/N**
- (e) Post procedural observation **Y/N**
- (f) Other significant factors (can include social factors that may have contributed to presentation)
- (g) If No to a) through to f) document the primary reason for presentation.

3. Was the primary reason for presentation to the Emergency Department for:

- (a) Wound dressing/review **Y/N**
- (b) Plaster change/review **Y/N**
- (c) Psychiatric condition **Y/N**

4. Indicate whether any of the following are applicable:

- (a) Patient transferred in from another hospital **Y/N**
- (b) Patient transferred out to another hospital **Y/N**
- (c) Patient died **Y/N**

Clarification of terms

Notation to admit (Q1a): includes references such as 'admit', 'admitted to', 'admitted for', or 'day ward' with a reference of the doctor responsible for the patient.

Critical Definitions

Invasive diagnostic investigations may include: blood transfusion, platelet transfusion, intragam infusion/injection, biopsies, lumbar puncture, myelogram, radiological examinations using injected contrast dye and radio-isotopes, retrograde pyelogram, intravenous pyelogram, CT scans.

Continuous observations/management may include situations where a patient needs to have a particular aspect of their care monitored or managed regularly with a specified frequency for a specified period of time, for example, a head injury patient requiring neurological observations or an asthma patient requiring continuous clinical intervention

Invasive procedures may include: treatment of fracture or dislocation which involves any kind of anaesthesia or IV sedation, intubation, manipulation under anaesthesia, sutures, excisions, incision and/or drainage, debridement, removal of FB, aspiration, packing or cautery of epistaxis

Specific issue to note

If it is clear that the patient's actual length of time in the ED is considerably greater than the time recorded in the audit data, then include the note 'inaccurate LOS' in the free text field.

Appendix E: Coding audit error categories

The following definitions apply in the selection of nature of error identified during the coding audit.

Two data items will be used in the audit for the purposes of classifying errors detected by the auditors. They are:

Nature of error: classifying the type of error in relation to the type of code in error as follows:

- *incorrect principal diagnosis:* signifies that the selection of the principal diagnosis was not correct. This is not to be used in cases when the code is incorrect but the diagnosis is correct. Cases where the condition selected is correct, but the code is incorrect will be captured in the category: Incorrect diagnosis code.
- *incorrect diagnosis code:* record the number of occasions within the admission where the diagnosis code was not correct at any level.
- *incorrect procedure code:* record the number of occasions within the admission where the procedure code was not correct at any level.
- *missing secondary diagnosis code:* record the number of secondary diagnosis codes that were not recorded within the admission (not associated with an incorrect secondary diagnosis code).
- *missing procedure code:* record the number of procedure codes that were not recorded within the admission (not associated with an incorrect secondary diagnosis code).
- *over-coding:* record the number of unnecessary codes (diagnosis or procedure codes) within the admission.
- *unsubstantiated code;* record the number of codes (diagnosis or procedure) where there was not sufficient information within the record to substantiate that code; this should include codes where either the base condition or the 5th digit level is not substantiated by clinical documentation.
- *other unspecified error.*

Reason for error

Record separately for incorrect principal diagnosis and for other errors whether any of the following applied:

- *data/entry/transcription error:*
- *inadequate documentation:* that may have contributed to the error.
- *non-compliance* with a coding standard;
- *other:* use free text to record.

Appendix F : Code reference lists

Admission source

- 1 Private medical practitioner
- 2 ED
- 3 OPD
- 4 Hospital transfer
- 5 Nursing home transfer
- 6 Episode change
- 8 Outborn
- 9 Born in hospital
- 10 Retrieval from another hospital
- 11 Contract from other hospital
- 12 Contract from health authority
- 13 Other contract
- 16 Correctional facility
- 17 Law enforcement agency
- 18 Community service
- 19 Retrieval not from other hospital
- 14 Other health care establishment
- 22 Routine readmission not requiring referral
- 29 Other
- 20 Organ procurement
- 21 Boarder
- 15 Private psychiatrist

Admission status

- 1 Emergency admission
- 2 Elective admission
- 3 Not assigned