The risk and consequences of clinical miscoding due to inadequate medical documentation: a case study of the impact on health services funding

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Abstract

As coded clinical data are used in a variety of areas (e.g. health services funding, epidemiology, health sciences research), coding errors have the potential to produce far-reaching consequences. In this study the causes and consequences of miscoding were reviewed. In particular, the impact of miscoding due to inadequate medical documentation on hospital funding was examined. Appropriate reimbursement of hospital revenue in the casemix-based (output-based) funding system in the state of Victoria, Australia relies upon accurate, comprehensive, and timely clinical coding. In order to assess the reliability of these data in a Melbourne tertiary hospital, this study aimed to: (a) measure discrepancies in clinical code assignment; (b) identify resultant Diagnosis Related Group (DRG) changes; (c) identify revenue shifts associated with the DRG changes; (d) identify the underlying causes of coding error and DRG change; and (e) recommend strategies to address the aforementioned. An internal audit was conducted on 752 surgical inpatient discharges from the hospital within a six-month period. In a blind audit, each episode was re-coded. Comparisons were made between the original codes and the auditor-assigned codes, and coding errors were grouped and statistically analysed by categories. Changes in DRGs and weighted inlier-equivalent separations (WIES) were compared and analysed, and underlying factors were identified. Approximately 16% of the 752 cases audited reflected a DRG change, equating to a significant revenue increase of nearly AU$575,300. Fifty-six percent of DRG change cases were due to documentation issues. Incorrect selection or coding of the principal diagnosis accounted for a further 13% of the DRG changes, and missing additional diagnosis codes for 29%. The most significant of the factors underlying coding error and DRG change was poor quality of documentation. It was concluded that the auditing process plays a critical role in the identification of causes of coding inaccuracy and, thence, in the improvement of coding accuracy in routine disease and procedure classification and in securing proper financial reimbursement.

Keywords (MeSH):

Clinical Audit; Diagnosis-Related Groups; Medical Errors; Case Mix; Funding; Hospitals; Hospital Administration; Australia; Clinical Coding

Introduction

In Australia, as in some other Western countries, coded clinical data are held in databases which are subsequently accessed for a variety of purposes. The applications to which coded hospital data are directed obviously drive the need for accuracy and reliability of clinical coding, and for the development of instruments to detect coding errors. The provision of appropriate funding of hospital services via the casemix-based funding model, for example, depends upon the reliability of grouping of medical conditions and procedures into Diagnosis Related Groups (DRGs), which is dependent upon the accuracy of clinical coding, and this in turn relies upon the quality of clinicians' documentation. Health statistics which inform social and medical research and health policy development are used under the assumption that they are accurate. Monitoring of information provided through coded medical records, for example the incidence and nature of complications, is essential to patient safety, the conduct of quality management and clinical risk management programs, and the construction of hospital performance tables.

The importance of coding accuracy: a review of the literature

When writing about hospital morbidity data on antibiotic resistance in Australia, Hargreaves and Kok (2003: S55), observed: 'The national introduction of the Australian versions of ICD-9-CM in 1995, and of casemix-based funding and management from the mid-1990s, has possibly led to more accurate medical record documentation and improved coding of these infections and are likely explanations for the observed increase in reporting'. These secondary benefits of casemix funding which are derived from its associated clinical coding cannot, however, be embraced without scrutiny. More than a decade ago MacIntyre, Ackland and Chandraraj conducted a review of hospital medical records designed to determine the accuracy of the injury data held in the Victorian Inpatient Minimum Database which were obtained from hospital morbidity data from public hospital separations with ICD-9-CM principal diagnosis codes 800-999. The findings lead the authors to observe that although coded data as a source of injury surveillance data are valuable (and as it happened in this case, reliable), there is always the possibility that the database could be compromised through the 'limitations of coded hospital morbidity data' (MacIntyre, Ackland & Chandraraj 1997: 779; see also MacIntyre et al. 1997). We note that these can include limitations of the coding system, including the standards and conventions, as well as potential coding errors.

Thus issues surrounding coding errors have long been recognised, and despite the fact that their consequences can be far-reaching there remains a paucity of literature on the matter of clinical coding audits themselves. Most of the literature on the theory of auditing deals with the auditing of financial processes and systems in use in various businesses (La Trobe University 2006). However, health care is very costly and it is essential for the financial viability of individual hospitals that they are appropriately reimbursed for the costs of the care and services they provide their patients. The concern of the current study was to determine the frequency and possible causes of miscoding in a large tertiary hospital in Melbourne, and to examine the impact of coding errors on the hospital's funding via the casemix model. The following review of the literature covering the years 2000 to 2008 (by which time the employment of DRGs had become well-established), nevertheless indicates that there is increasing concern about the frequency and sources of coding errors and the need to minimise them.

We pause to emphasise here that for the purposes of this study we are focusing on the principles rather than the idiocyncrasies of the different systems; that is, we are not comparing systems such as ICD-9, ICD-9-CM, ICD-10 and ICD-10-AM.

Consequences of miscoding: funding of health services

That the accuracy of clinical coding is crucial to the appropriate funding of health services when the funding mechanism is based on DRGs (casemix) has been demonstrated by Curtis, Bollard and Dickson (2002). In an investigation into the accuracy of clinical information coding in an Australian tertiary trauma centre, they showed that of 100 records reviewed, 28% required

changes to their DRGs, resulting in a substantial increase in funding. Interestingly, the authors recognised the clinical documentation skills of nursing staff when they wrote that '[t]he validity of coding is dependent on legible, comprehensive and complete documentation and is improved dramatically by using nursing case managers' patient progress summaries' (Curtis, Bollard & Dickson 2002).

The importance of the documentation and coding of additional diagnoses is stressed by Reid, Allen and McIntosh (2005). A coding audit (non-blind) described by these authors was designed mainly to check that all additional diagnoses for leukaemia, non-acute leukaemia and lymphoma had been recorded, coded and therefore claimed for by a Sydney hospital during the fiscal year 2000-2001. A 'gold standard' coder reviewed and adjudicated on those cases where the auditor did not concur with the original coder. The authors found that there were fewer high-complexity episodes in the year under study. They also found that under-coding of complications and/or comorbidities was more frequent than over-coding, resulting in overall under-funding. A study by Marshall and Adema (2005) found that the overall coding error in a health system in Florida was 84.5%, with a consequent significant loss of funding. The facility introduced a number of measures to correct these errors, including a daily review of coding by coding experts. (See also Adams, Norman & Burroughs 2002; Fillit et al. 2002).

Service providers, however, are not alone in their concern about the link between accurate coding and correct funding. In the USA, Wachter, Foster and Dudley (2008) report the use of coding to identify (and stop payment for) preventable conditions (e.g. bedsores, ulcers) which arose as a result of poor patient management, by the introduction of a new approach to coding for pre-existing conditions. The strategy in this case was to improve patient care and safety by penalising the facility for poor care. In this instance, patient safety and funding had become interlinked.

Coding errors can occur beyond the hospital environment; for example mortality coding from death certificates can have far-reaching policy and financing consequences. An unexpected outcome of racial bias in coding cause of death data which was also linked to funding inequity, was revealed in a study by Graber et al. (2005) who found that the incidence of cardiovascular disease (CVD) mortality among Maine American Indians had been underestimated. Correction of the coded data showed that 38.5% incidences had been misclassified (17.8% coding errors; 20.7% data entry errors). As a result it was realised that the rate of CVD was in fact constant across the population, and funding for the condition in the indigenous population was then duly increased.

Although the primary concern of this study was the effect of coding inaccuracy on the funding of health services, the following reveals that there are other important effects of miscoding which, like the previous two examples, are sometimes linked to funding.

Consequences of miscoding: hospital performance or league tables

In Australia, coded patient discharge records are fundamental to planned national strategies designed to improve patient safety and quality of care (National Health and Hospitals Reform Commission 2008).

A coding audit in a multi-speciality urological clinic in the USA conducted by Ballaro, Oliver and Emberton (2000: 389) revealed a high rate of coding inaccuracy by urology clinician trainees, to the extent that the authors claimed that 'the clinical codes generated from the authors' department do not accurately reflect the clinical practice'. They state therefore that any performance tables based upon routine clinical data would be unreliable. Jameson and Reed (2007) also stressed the importance of accuracy in coded data which are used in the construction of league tables in the UK. (See also Berridge 1998).[1]

Consequences of miscoding: surveillance and epidemiology

Hospital discharge data are a critical resource for disease surveillance programs, which in turn are used to inform disease prevention and other public health programs. Schoenman et al. (2008: 455), for example, list public health applications of hospital discharge data in the USA

1 For examples of hospital league tables in the UK see: www.performance.doh.gov.uk/tables98/pdf/wnwes2.pdf and in Australia, see: http://www.aihw.gov.au/publications/index.cfm/title/10305

as 'disease surveillance and prevention, economic burden-of-illness studies, public health reporting' and environmental health. They note that the users of these databases are 'diverse, including government agencies, provider associations and individual providers, consumer organizations and patients, health care insurers and other purchasers (e.g. large organizations and patients, health care insurers and other purchasers…, policy makers, researchers, and private-sector interests, such as database vendors and consultants' [2008: 453-4]).

As Moje, Jackson and McNair (2006: 333) point out in their study of the accuracy of injury coding in Victorian hospitals: 'The usefulness of abstracted data for quality and safety purposes relies on good documentation in the medical record, thorough coding and periodic data audit'. McCarthy et al. (2000: 868), when referring to coding in California and Connecticut of complications such as post-operative acute myocardial infarction, found that the coding was at times inaccurate (or missing), resulting in under-funding and also raising concerns about the 'clinical validity of using ICD-9-CM codes for quality monitoring'. Nelson et al. (2004) also stressed the importance of recognising and correcting coding inconsistencies in the provision of accurate data for epidemiological surveillance, and for monitoring the effectiveness of vaccination and disease prevention programs.

Data used in the USA by the Centres for Disease Control and Prevention (CDC) to compile its disease surveillance databases are obtained directly from coded information which is collected on a regular basis from a vast number of sources in the USA (see, for example, Brown et al. 2008). Accuracy and completeness of coding recorded in these systems is reflected in the planning and appropriate funding of many public health programs.

Coding, surveillance and 'true burden' estimations

Being able to estimate the true burden of specific illnesses is not necessarily a simple matter. In Australia, for example, Newall, Wood and Macintyre (2008: 2136) found: 'Estimating the true burden of influenza is problematic because relatively few hospitalisations or deaths are specifically coded as influenza related.' Following scrutiny of hospital and mortality records, in which several ICD-10-AM code groupings were examined (including influenza and pneumonia, other respiratory disorders, and circulatory disorders) the authors concluded that the true burden of influenza is greater than that directly diagnosed and documented as the '"principal" cause of hospitalisation or the "underlying" cause of death'. Their analysis of the hospital coded data was useful in estimating the burden of influenza and in evaluating the need for targeted vaccination.

When Clothier et al. (2008) assessed the true burden of invasive pneumococcal disease (IPD) in Victoria, a comparison of notified and non-notified cases was made by determining the hospital-allocated ICD-10-AM code that could be linked to notified cases of IPD. The authors stated that 'at least one-sixth' of laboratory-confirmed (notified) IPD cases were missed by the IPD surveillance program, which depended upon ICD-10-AM coding. They therefore concluded that it would be necessary to improve both coding and notification of hospitalised cases of IPD.

Often it is the degree of specificity of coding rather than its inaccuracy per se that can lead to false estimates of the burden of disease. Durante et al. (2008: 389) examined the true mortality burden of chronic liver disease (CLD) in the USA. Because in that country the National Centers for Health Statistics (NCHS) use coded data from death certificates to estimate the burden of disease, the authors of this study compared data from certificates that indicated CLD as the cause of death via one of 115 ICD-9-CM codes with medical records, medical examiner reports and certifier questionnaires and concluded that using the coded records alone is not a reliable indicator. The authors claim: 'The NCHS method may understate the CLD burden substantially which could have a detrimental effect on planning for and evaluating prevention and treatment'. The NCHS will need to cast a wider net and register more specific codes in order to make this method of assessment more accurate.

Nevertheless there are instances in which discharge data and data obtained from other databases are in sufficient agreement for them to be used with confidence. A study of the burden of inflicted traumatic brain injury in children in

the USA conducted by Ellingson, Leventhal and Weiss (2008) showed there was strong correlation between records obtained from the Kids' Inpatient Databases (KIDs) and hospital discharge databases. Hospital inpatient data for passive surveillance of children at risk of shaken baby syndrome (SBS) was found by Wirtz and Trent (2008: S134) to be 'a critical component for a comprehensive SBS surveillance system and may be adequate for some purposes, including identifying high-risk areas or groups for intervention and monitoring trends over time'.[2]

Clearly it is in the interests of a range of agencies to be able to estimate the incidence of coding errors by means of coding audits and other tools, and to locate and correct the causes of these errors. The remainder of the review indicates an increasing interest in this aspect of miscoding.

Clinical coding audits

One reason why organisations are prompted to undertake clinical coding audits is because of observed discrepancies between actual clinical practice, as documented in the medical record, and coded data. In their above-mentioned study, Reid, Allen and McIntosh (2005) identified an error rate of 15% in the assignment of DRGs in a Sydney hospital audit undertaken in order to identify whether a reduction in the assignment of episodes from one fiscal year to the next was due to inconsistent coding or to an actual reduction in the incidence of leukaemia. Clinical haematology staff had reported no decrease in their workload (i.e. there was a discrepancy between observed and reported cases).

Similar discrepancies between reported and actual clinical practice were reported in the USA by Ballaro et al. (2000), mentioned above. Likewise, when comparing discharge diagnostic codes with actual laboratory data analysis of discharge data used in surveillance of childhood diarrhoeal disease in Hong Kong, Nelson et al. (2004) found a discrepancy between the two means of reporting the incidence of rotavirus-related diarrhoeal disease.

Types of errors and reasons for flaws in coding

In a retrospective review of trauma registry documentation and hospital records in Queensland for 1998, McKenzie et al. (2005: 3) found that the main causes of coding errors were 'failure to identify relevant patients, inappropriate inclusion of patients, insufficient/inaccurate data in hospital records and insufficient/inaccurate data in the trauma registry'. An overall concordance rate of 95% between the two data sources was found. Regular monitoring and assessment is necessary to maintain the accuracy of data which can be potentially used in injury surveillance and for education purposes and quality assurance strategies.

A further outcome of the study by MacIntyre et al. (1997) was recognition of the evidence of errors in principal diagnosis code assignment, procedure code errors and errors in external cause codes. There were significant errors of omission of codes for comorbidities; however, the coded data were considered to be sufficiently accurate to be used for injury surveillance purposes. In a similar coding audit of Victorian public hospitals designed to evaluate the reliability of the Victorian Inpatient Minimum Database for epidemiological purposes and disease surveillance, MacIntyre et al. (1997) found a 22% discrepancy in principal diagnosis codes.

The usefulness of diagnostic coding as a quality measure of obstetric care was examined by Brubaker et al. (2007: 1141). In an assessment of the accuracy of coding of anal sphincter laceration at vaginal delivery in the USA they found that coding errors for this event were common, primarily due to omission of codes. They concluded that '[b]efore diagnostic coding can be used as a quality measure of obstetric care, the clinical events of interest must be appropriately defined and accurately coded'.

It has also been observed that there can be regional (i.e. demographic) variations in coding accuracy within a country, reflecting 'cultural' differences in coding in different organisations. Lorence and Chen (2008), Lorence and Ibrahim

2 The inaccuracy of coding is not the only factor which contributes to misconceptions about health statistics, however. Press reports based on hospital administrative data regarding the incidence of bile duct injury during laparoscopic cholecystectomy in Canada suggested that bile duct injury was common in Canada. Examination of records indicated that 'major' injuries were correctly coded but of those coded as 'minor', 95% were irrelevant to the patients' outcome. In other words false interpretation of coded data can lead to public misinformation (Taylor 1998).

(2003), and Lorence, Spink and Jameson (2002) found wide variations in coding accuracy across the USA. However, research by Santos et al. (2008: 25) revealed that '[n]o differences were found in error rates between rural and metropolitan hospitals, or general and specialist hospitals' in Victoria, although Moje et al. (2006) reported that the depth of coding does vary across hospitals in Victoria. In a study of hip fracture outcomes, a comparison of two databases (hospital coded records and a hip fracture database) showed reasonable correlation in statistics; the use of 'ambiguous clinical codes' was the main source of errors (Pervez, Bhargava & Parker 2003).

Given the complexity of modern medical treatments and procedures it is perhaps not surprising that errors in clinical coding directly relating to this factor are commonplace (see, for example, Adams et al. 2002). In the USA, O'Malley et al. (2005: 1620) reported that the '[m]ain error sources along the 'patient trajectory' include amount and quality of information at admission, communication among patients and providers, the clinician's knowledge and experience with the illness, and the clinician's attention to detail. Main error sources along the 'paper trail' include variance in the electronic and written records, coder training and experience, facility quality-control efforts, and unintentional and intentional coder errors, such as misspecification, unbundling, and upcoding'.

In a Western Australian study, Li et al. (2003: 133) identified significant errors in the coding of endophthalmitis diagnosis and cataract procedures. They reported that '[t]he validation of a random sample of the non-surgery-related cases coded with endophthalmitis suggested that the vast majority of them were miscoded (88%, 139 of 158 sampled from 1474 cases)'. The coding errors were described as 'systematic', and both the clinical and coding departments of the hospital were responsible for the errors. Ng et al. (2003), when reporting on other aspects of this research, indicated that improvements in the level of miscoding and code misuse in endophthalmitis coding were most likely associated with the introduction of clinical coding standards and the training of clinical coders in Western Australia.

Our study relates to coding from hospital medical records; however it is of interest to note the findings of Lu, Lee and Chou (2000). In doing this, we emphasise that coding from death certificates occurs in a different environment from hospital medical record-based coding and the death certificate coder has far less information at hand to justify and support their coding decisions (see, for example, McKenzie, Chen & Walker 2009). In a study of underlying cause of death (UCD) coding errors in Taiwan, Lu, Lee and Chou (2000) found that the degree of ICD-9 miscoding depended upon the UCD; for example there was good agreement for malignant neoplasms, and injuries and poisoning, while for nephritic and hypertension-related diseases and cerebral infarction there was greater discrepancy between the reviewers and the original coders. Suggested reasons for these inconsistencies were: incorrect interpretation of coding rules, disagreements on nomenclature, and inappropriate judgment of causal relationships.

Education issues: knowledge skills of coders

The complexities surrounding coding knowledge skills have been emphasised by Arthur and Nair (2004: 210), who compared the standard of coding of operative procedures and interventions by clinicians with that of professional coders. They claimed that '[i]n the absence of formal training for clinicians, coding of procedures should probably be left to coding clerks'. However, blame for coding errors does not always rest with the clinicians. An audit of coding in a plastic surgery theatre in a UK hospital by Colville, Laing and Murison (2000: 420) showed that although clinical coders were generally more accurate than theatre staff, a significant number of errors by the coders could be attributed to 'limited understanding of terminology and techniques'. The authors recommended that there be 'closer cooperation' between surgeons and coders. Fillit et al. (2002), who studied coding of Alzheimer's Disease (AD) and its associated conditions, estimated that AD was 'grossly undercoded' in acute hospital and outpatient settings for a number of reasons, including problems with AD coding itself, and failure by clinicians to correctly diagnose the condition. Under-coding of AD results in under-funding and also undermines

care management. (In interpreting these results, it is important to be mindful of the sometimes considerable differences in the formal education levels of clinical coders from one country to another: for example in Australia some clinical coders, especially in Victoria, have a university degree in health information management, compared with the UK where this is not the case).

Tracking coding errors

Because of the potential consequences of coding errors the ability to track them is clearly advantageous. Lam et al. (2008) describe a data quality assessment tool, Performance Indicators for Coding Quality (PICQ) which has been used to assess the quality of hospital obstetric morbidity coding extracted from the 2004-5 Australian national morbidity dataset by identifying incorrect coding for ICD-10-AM. In this instance, the authors identified a number of types of coding errors including those related to completeness, redundancy, specificity and sequencing problems. It was concluded that the accuracy of coding assigned in the records studied was 'fair'. (See also Kearsey, Peasley and Truran 2001; Santos et al. 2008).

Minimising coding errors

It is clear from the above review that errors in clinical coding must be avoided, or at least minimised. In their Australian study of the organisational factors that affect the quality of clinical coding, Santos et al. (2008), identified factors that improve accuracy of coding as coders' role behaviour, improved career opportunities, higher staffing levels, reduced throughput, fewer time constraints and increased interaction between coders and clinical staff. Stavely (2000) stressed the importance of good medical record documentation and the use of routine coding audits as one of the levels of review used by Baptist Health Systems in the USA. This bears some similarities to the type of review that occurs in Australian hospitals.

Lessening the workload and improvement of professional working environment are desirable goals. Schoenman et al. (2008: 463), when reviewing the applications of hospital discharge data in the USA, recommended a number of measures to ensure their accuracy and hence reliability of the databases which used these data, including enhancing the data elements reported in discharge databases; building more comprehensive data systems; and providing technical assistance to improve the analytic and reporting capacity of statewide data organizations'.

Study context: funding of health services in Victoria

The public hospital casemix model

On 1 July 1993 Victoria became the first Australian state to use a casemix-based funding model to set budgets for its public hospitals (Department of Human Services Victoria 2008; McNair & Duckett 2002). Victoria's casemix funding approach now applies to inpatient, outpatient, and rehabilitation services in the public healthcare sector, and a version is applied in the private hospital sector (Department of Human Services Victoria, 2008).

The relationship between hospital revenues and auditing of clinical coding

For the past 60 years, teaching hospitals in Australia have been routinely using disease and procedure classification systems to code information about their inpatients. Today, teaching and non-teaching hospitals, as well as day care facilities in both the public and private sectors, systematically code and index their medical record data for a variety of purposes. Australia uses the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification* (ICD-10-AM). This is produced, managed and updated regularly by Australia's National Centre for Classification in Health (National Centre for Classification in Health 2008) for the Australian Department of Health and Ageing (DoHA), under licence from the World Health Organization (WHO). The NCCH also produces, under contract from DoHA, the *Australian Classification of Health Interventions (ACHI)* which is based on the national Medicare Benefits Schedule (MBS) (National Centre for Classification in Health 2008). The ICD-10-AM has an accompanying set of *Australian Coding Standards*; the coding standards are both comprehensive and complex.

Aims and objectives

The aim of the audit was to examine the clinical coding and DRG processes in a large tertiary teaching hospital in Melbourne, in relation to the status of the hospital's revenues. This hospital has a wide range of specialties and super-specialties, and has a very complex casemix profile. The objectives of the audit were to:

- measure discrepancies in clinical code assignment
- identify resultant DRG changes
- identify DRG revenue shifts associated with the DRG changes
- identify underlying causes of coding error and DRG change
- recommend strategies to address the aforementioned.

Method

The audit sample comprised 752 coded inpatient cases discharged from a specialised surgical unit in a major teaching hospital during the six-month period November 2004 to April 2005. The sample constituted 100% of the separations (discharges) from the specialty unit during the study timeframe, accounting for approximately 3% of the hospital's acute care separations, excluding routine dialysis treatment episodes.

The unit was targeted for the sample selection because it was anticipated that the cases would provide a reasonable balance of both clinical, and clinical coding complexity and diversity. The audit was designed to test the accuracy of clinical coding and DRG assignment in the medical records of patients discharged from this unit which undertakes specialised surgical practice. The coding and DRG processes for discharged inpatient episodes, over the selected six-month timeframe, were audited.

The hospital's Clinical Coding Unit, like others of its kind in Victorian hospitals, is housed in and managed by the Health Information Service. A very experienced and senior member of the Clinical Coding Unit undertook the clinical coding and other functions of the audit including identification of DRG change, related revenue shifts, and underlying causes of coding error, and the formulation of recommendations based on the findings of the audit. A blind auditing method was used whereby the auditor 'blind' re-coded medical records previously coded by the professional health information managers and clinical coders in the Clinical Coding Unit. The audit was designed to minimise potential auditor bias: the auditor was not able to view the previously allocated codes during the audit process.

Results

The data were analysed by comparing the original codes and DRG grouping and revenue, to the codes, DRG grouping and revenue calculated from the sample by the auditor. Significantly, the audit revealed that 118 cases, or 15.7% of the 752 cases audited, had a DRG change. These DRG changes equated to a difference in total revenues, owed the hospital, of AU$575,290.80 (Table 1).

Table 1: DRG and WIES changes of surgical unit discharges for the six-month period, November 2004 – April 2005

NUMBER OF CASES AUDITED	NUMBER OF CASES WITH A DRG CHANGE	DRG CHANGE %	WIES [1] VARIANCE	FINANCIAL ($AUS) VARIANCE
752	118	15.7	197.51	575,290.80

The audit result also showed that in 67 of the 118 episodes that had a DRG change, that is, in 57% of all audited episodes showing a DRG change, the change was very clearly due to issues relating to the quality of the medical record documentation, specifically the lack of proper medical record documentation at the time of the original coding. Those episodes subsequently had their respective WIES increased when the relevant attending doctors were requested during the auditing process to review their documented diagnostic information, thereby resulting in the addition of previously under-recorded diagnoses or other clinically-sound amendments to the principal diagnosis.

Only 15 of the 118 episodes that had a DRG change, that is, in 13% of all audited episodes with a DRG change, the change was due to incorrect selection of the principal diagnosis and/or code assignment by the original coder.

The audit revealed that 34 of the 118 episodes that showed a DRG change were due to missing additional diagnosis codes and/or missing procedure codes. This category of missing codes

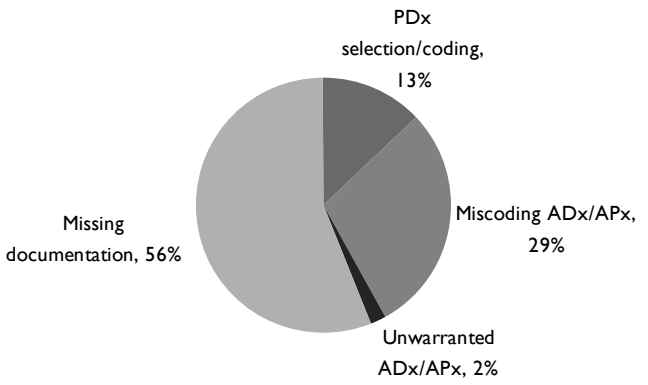

Figure 1: Factors contributing to DRG change

PDx: Principal Diagnosis; ADx: Additional Diagnosis; APx: Additional Procedure

accounted for almost one-third, specifically 29%, of all audited episodes with a DRG change.

Incorrect or unwarranted procedure coding was the reason for a DRG change in only two episodes; these constituted only 0.27% of all cases audited or 2% of the cases with a post-audit DRG change (Figure 1).

The most commonly missed documentation identified by the audit tended to focus on a few conditions such as hypokalaemia (24 cases) and urinary retention (five cases) (Figure 2). There were 11 cases of DRG change relating to missing documentation of a procedure-related complication such as wound complication, accidental injury, and post-procedural anaemia.

Ten further cases had missing co-morbidity diagnoses such as atelectasis, sepsis, and urinary tract infection. Significantly, 14 cases had missed or inappropriate principal diagnosis documentation (Figure 2).

Discussion

Once the underlying cause of the abnormal DRGs had been identified during the internal audit, requirements for further focused training of the coders and the clinicians were recommended by the auditor. These recommendations were in line with common practice, and designed to address the key problem areas identified in the audit in order to generate continuous improvement in the quality of the coding and DRG data outputs.

The results demonstrate the power of routine and systematic internal clinical coding audits, given the half million dollars in revenue that was found through the audit. They also exemplify the multiplicity of factors that influence revenue calculation in a casemix-based funding system, the most important of which is the quality and quantity of medical record documentation. We note that the importance of good documentation extends far beyond the requirements of clinical coding, DRGs and revenue raising; however, for the purpose of this paper, we have limited our discussion to these outcomes.

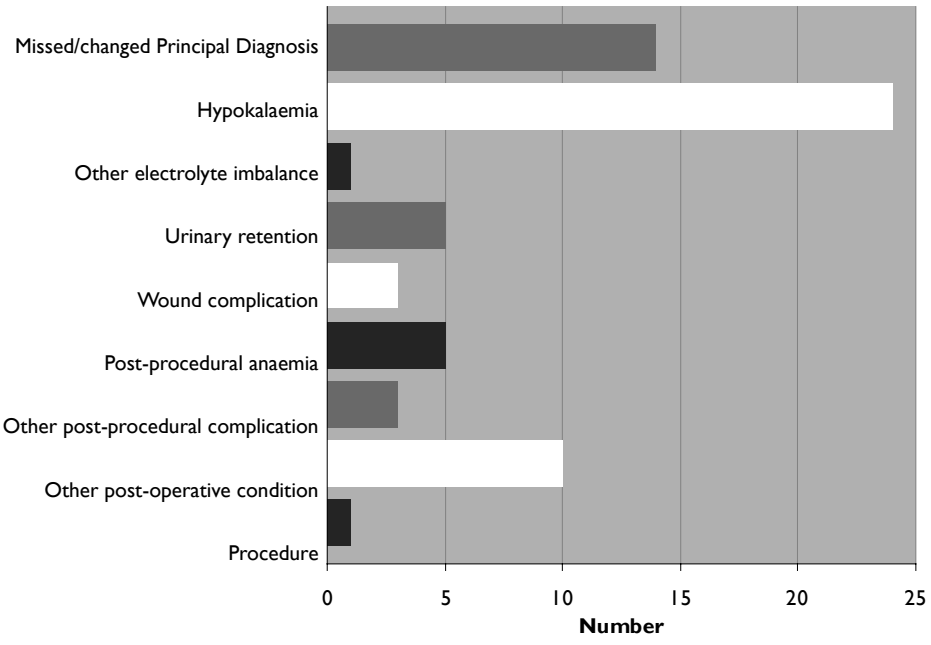

Figure 2: Documentation problems

Other relevant factors identified in the study related to coding practice, including the selection and coding of the principal diagnosis, and missing additional diagnosis codes. These were subsequently addressed in the post-audit coder education sessions.

Conclusion

It might be concluded from this audit study that whilst high level skills, and depth and currency of knowledge in clinical coding are critical for good coding and financial outcomes, the overriding need for improvement lies in the documentation.

The fact that the major problem identified in the audit related to the quality of the medical record documentation rather than to the quality of the coding is encouraging feedback for the coders, their managers and the hospital. As a direct outcome of the study, the problems with the documentation have been addressed via the following actions, based on the auditor's recommendations:

i) The internal clinical coding auditor meets with senior clinicians from each clinical department to address documentation problems and answer queries, for example relating to suspected conditions or principal diagnosis selection, which may impact upon coding practice.
ii) The internal auditor attends clinical case study meetings to advise on the relationships between coding requirements and medical record documentation.
iii) The Coding Unit Manager and/or Coding Educator conducts education programs for interns and other junior clinicians on medical record documentation.
iv) Health information managers from the hospital's Health Information Service provide education to clinicians on casemix and DRGs, to help them understand the importance, in a casemix-based funding environment, of accuracy and completion of their medical record documentation.

The medium-term outcomes of the education program will be evaluated in a forthcoming audit.

In summary, the coding auditing process plays a critical role in the improvement of coding accuracy in routine hospital disease and procedure classification activity and in securing proper financial reimbursement, in Victorian hospitals. It is important in identifying the underlying causes (e.g. coding skills, coding knowledge, and the quality of documentation) that might lead to DRG change and the need to implement practice changes or clinician and clinical coder education programs.

Casemix funding models have had the effect of increasing the emphasis on the quality of hospital–coded data in terms of obtaining appropriate revenue reimbursement according to the complexity of cases treated, in addition to the wide range of additional uses of casemix data including: review of clinical practice, facilities planning, workforce planning, and internal management of the hospital. Regardless of the potential and actual uses of coded data, accurate and comprehensive clinical documentation is an essential prerequisite to reliable clinical coding.

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