

# The effects on clinical coding of the critical pathway recording methodology

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## Abstract

A two-stage study aimed to identify the effects of the critical pathway recording methodology on clinical coding practice and to determine coders' participation in pathway development. Critical pathways were found to be in widespread use, with low coder participation in pathway development and poor education on pathway data extraction. Coders favoured the traditional medical record format; private sector coders predominated amongst those who preferred to code from records containing pathways because of poor private sector clinical documentation. The documentation factors that most affected the clinical coding process were consistent with those identified previously and were primarily doctor-related.

**Key words:** *Critical pathways; clinical coding; clinical documentation; medical records; health information management*

## Introduction

Two components of the Australian health care reform process which affect clinical documentation and clinical coding are (i) the introduction of casemix-based funding and its adoption, in part, by health insurance funds; and (ii) a focus on quality improvement. Alternative ways have been explored to deliver high quality patient care, effectively manage resources, and reduce length of stay. Critical pathways constitute one such alternative by incorporating multidisciplinary care and discharge planning, and providing a clinical and financial system for evaluating the impact of clinical documentation on resource utilisation, length of stay and patient outcomes.

Critical pathways have been described as "... abbreviated versions of the multidisciplinary processes which need to occur in a timely and sequential manner to achieve quality outcomes" (Compton et al 1995, p102). Pathways are documentation tools used to outline a patient's predicted course during a hospital admission for a particular diagnosis or procedure, through the optimal sequencing and timing of agreed interventions by doctors, nurses, and other clinicians, and the capturing of variations in the course of treatment and progress embodied in the pathway. They facilitate continuous quality improvement by ensuring optimal resource utilisation, minimising delays and maximising the consistency of patient care. Pathways are a mechanism for reviewing, improving and upgrading the processes, practices and outcomes of care delivery, resulting in a higher quality of patient care (Compton et al 1995; Carpenito 1995). It has been argued that they have the capacity to improve medical record documentation by eliminating ambiguity, reducing bulk and duplication, streamlining and standardising documentation, and through the continual assessment and revision of the pathway itself (Zander 1992; Beyea 1996; Whipple & Little 1997).

## Aims and objectives

Clinical coders in the state of Victoria were surveyed in 1999 for their opinions on the effect of critical pathways on the coding process and on the quality (specifically, the consistency, accuracy and reliability) of the coded data. It is noted that, in Victoria, health in-

formation managers undertake most of the clinical coding, with those clinical coders who have not completed a university degree comprising a relatively small component of the coder workforce. For the purpose of this study, both categories were included and are referred to generically in this article as "clinical coders".

Terms used to describe care process guides and disease management decision algorithms are not well standardised (Kohn 2002). For the purpose of this study, "traditional" medical recording methodologies, incorporating source-oriented, problem-oriented and integrated record formats, were bunched and compared with the critical pathway methodology.

The study aimed to examine the effectiveness of critical pathways as a recording methodology, and to determine whether pathways meet the criteria for a continuous quality improvement tool in relation to the medical record documentation requirements upon which the clinical coding process is dependent. The multiple objectives of the study were:

- i. To identify the documentation issues that clinical coders believe hamper the coding process and contribute to poor-quality coded data;
- ii. To determine whether or not clinical coders use critical pathways for the purpose of coding;
- iii. To determine the effect exerted by critical pathways on the accuracy and consistency of coded data, as perceived by clinical coders (ie, as opposed to the [Victorian] Department of Human Services' or other funders' perceptions of accuracy);
- iv. To determine the extent of clinical coder participation in the development and revision of critical pathways;
- v. To determine whether clinical coders are educated in methods of extracting data from critical pathways;
- vi. To identify the benefits and the deficiencies that critical pathways bring to the coding process, as perceived by clinical coders; and
- vii. To determine clinical coders' preferred recording methodology (for the purposes of coding).

**Method and materials**

**Research participants**

A sample of 100 clinical coders was selected randomly from the target population of 442 coders employed in private and public hospitals and day-procedure centres in the state of Victoria. The target population was enumerated via the Victorian coder population listing held by the Victorian Department of Human Services (DHS) and the Bachelor of Health Information Management graduate listings from La Trobe University for the two years since the compilation of the DHS listing. A two-stage study was undertaken: in stage one, a self-administered questionnaire was mailed to all members of the sample, and in stage two face-to-face interviews were conducted with a sub-sample of the respondents who completed all three sections of the questionnaire and who had completed the consent form agreeing to participate in an interview. Six of the 14 respondents who qualified for stage two were randomly selected to be interviewed.

**Procedure**

The survey instrument comprised three sections. Section A sought demographic data, asked whether critical pathways were used at the respondent’s facility, and required respondents to nominate, from a list of items identified in the first Australian coder workforce study (Health Information Management Association of Australia [HIMAA] 1995), the five documentation factors that clinical coders believed impacted most upon coding quality at their facility. Section B, comprising a mix of 13 open, partially open or closed questions, was completed by clinical coders who use pathways. Six categories were explored:

- i. participants’ perceptions of how pathways affected the coding process and the coded data;

- ii. the diagnoses and procedures for which pathways were used;
- iii. clinical coders’ use of pathways;
- iv. the extent of coder education and involvement in pathway development and change;
- v. the changes that coders would like to see made to pathways; and
- vi. coders’ preferred recording methodology when coding.

Section C, a “Consent to be Contacted” form, ascertained the subjects’ willingness to participate in the second (interview) stage of the study. This stage afforded the researcher the opportunity to probe vague responses, explore areas identified from the questionnaires as pertinent, follow-up unexpected and interesting responses, and enhance reliability by determining consistency of responses.

**Coding and analysis of the data**

The responses were coded into distinct categories and thematic analysis was undertaken on the qualitative data obtained from the questionnaires and interviews.

**Results**

**Response rate**

Twelve subjects were excluded from the sample of 100 coders, reducing the effective sample size to 88; the 12 subjects were excluded for reasons relating to inability to contact, or to locate for follow-up. The overall response rate (and the statistical base of the questionnaire study) was 78% (*n* = 69).

Thirty percent of the respondents (*n* = 14) also completed and returned the Section C consent form, six of whom (13% of all respondents) were selected randomly for face-to-face interview.

**1: Demographic characteristics of the sample**

<u>Factor</u>	<u>Frequency (f)</u>	<u>Percentage of coders</u>
Gender		
Female	61	88
Male	8	12
Age (years)		
20-29	30	43
30-39	18	26
40-49	17	25
50-59	4	6
60+	0	0
Sector		
Public	49	71
Private	20	29
Classification of the facility*		
Acute	64	93
Aged care	3	4
Day procedure	5	7
Sub-acute/rehabilitation	8	12
Psychiatric	11	16
Location		
Melbourne/metropolitan	45	65
Country/regional	24	35

\*The total percentage of this category exceeds 100%, because some respondents are employed in facilities that service more than one of the listed specialty areas.

**2. Documentation factors affecting coding quality, in ranking order**

<u>Documentation factors affecting coding quality</u>	<u>Frequency (f)</u>	<u>Percentage of total responses</u>	<u>Ranking</u>
Identification of principal diagnosis	56	16.2	1
Identification of complications	45	13.1	2
Identification of associated diagnoses	36	10.5	3
Incomplete medical record content	35	10.2	4
Illegibility of medical record entries	33	9.6	5
Ambiguity of written entries	30	8.7	6
Identification of principal (first) procedure	24	6.7	7
Terminology used	15	4.3	8
Identification of investigations	14	4.1	9
Identification of other procedures performed	12	3.5	10*
Amount of handwritten entries/progress notes	12	3.5	10*
Bulk of records/volume of paperwork	11	3.2	11
Medical record format (physical layout)	8	2.3	12**
Abstraction time (time taken to abstract information from record for coding)	8	2.3	12**
Duplication of information within the record	3	0.9	13
Other: Contradictory information in records	2	0.6	14
Other: Documentation of a symptom caused by actual condition diagnosed later but not documented by attending doctor.	1	0.3	15

\*Equal 10th ranking. \*\*Equal 12th ranking.

**Characteristics of the sample**

The demographic characteristics of the sample are shown in Box 1. There was a 1:8 ratio of male to female respondents. The respondent clinical coders were employed predominantly in the public sector (71%; *n* = 49). Twenty-nine percent (*n* = 20) worked in the private sector. These percentages are generally consistent with the projected rates of growth for coder positions determined by Robinson et al. (1992). Sixty-five percent of the respondents (*n* = 45) were employed in Melbourne metropolitan facilities and 35% (*n* = 24) in country Victoria, a ratio of 2:1. This is consistent with the 3:2 (metropolitan:country) ratio reported by McIntyre (1998).

**Findings**

**Documentation factors affecting coding quality**

Clinical coders were asked to select, from a list of documentation factors that affect coding quality, the five factors that they believed had the greatest impact on the quality of coding in their workplace (Box 2).

Clinical coders found the identification of principal diagnosis to be the documentation factor that had the greatest impact upon coding quality (16.2%). This was followed by identification of complications (13.1%) and of associated diagnoses (10.5%), incomplete medical record content (10.2%), and illegibility of medical record entries (9.6%). It is noted that the change to the application since July 2000 of Australian Coding Standard (ACS) 0002 may alter coders' perceptions of the need to capture associated diagnoses. A comparison is beyond the scope of this article, which reports on a study undertaken under the previous standard.

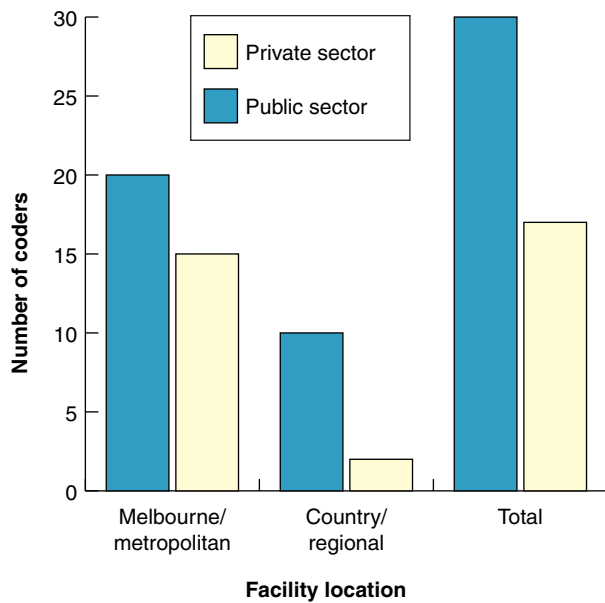
In 1994 and 2002, the Australian Coder Workforce (ACW) Study (Health Information Management Asso-

ciation of Australia 1995; McKenzie et al 2003) sought health information managers' and coders' perceptions of the negative impact of certain documentation factors on their ability to code. There was an improvement in 2002, reported by McKenzie in 2003; however, the factors identified consistently in both studies as most affecting coding quality were incomplete medical record content (95.4% in 1994 and 77% in 2002), complications/comorbidities not identified (94.9% and 71.1%), illegible medical record content (95.0% and approximately 70%), and principal diagnosis not identified (92.2% and 73.7%).

**3: Ranking of documentation factors affecting coding quality, by sector**

<u>Rank</u>	<u>Public Sector Documentation Factor</u>	<u>Private Sector Documentation Factor</u>
1	• Identification of principal diagnosis	• Identification of principal diagnosis
2	• Identification of complications	• Identification of complications • Incomplete medical record content ( <i>ranked equal</i> )
3	• Identification of associated diagnoses	• Identification of associated diagnoses • Illegibility of medical record entries ( <i>ranked equal</i> )
4	• Incomplete medical record content	• Ambiguity of written entries
5	• Ambiguity of written entries • Illegibility of medical record entries ( <i>ranked equal</i> )	

**4: Clinical coders who use critical pathways, according to employment sector and facility location**



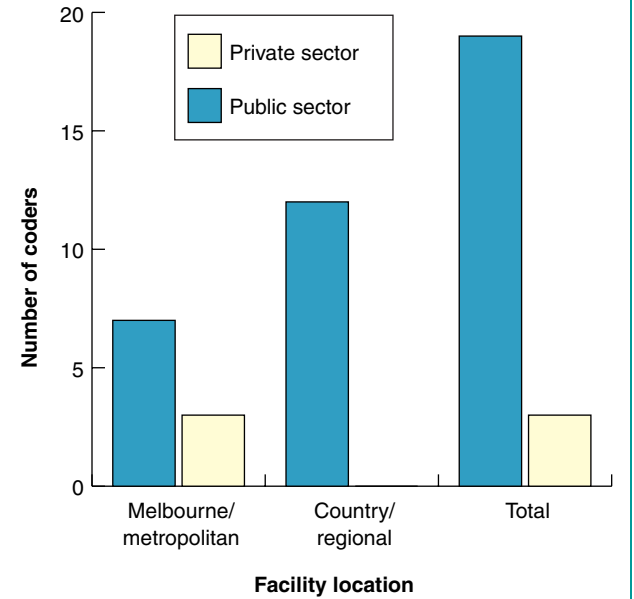
Similarly, in coding audits conducted by Chisholm et al. (1994), Donoghue (1992) and Callen et al. (1997), identification of principal and associated diagnoses, inconsistent or unclear documentation, and ambiguity of medical record content were found to be the main causes of coding error and to contribute to other leading sources of error. Therefore, the primary documentation factors affecting coding quality have changed little during the past decade. When analysed according to employment sector, the same factors are identified but are ranked in a different order (Box 3). Respondents in this study nominated the top five factors; however, analyses revealed joint (equal) rankings in the responses from both the public and private sectors; therefore, the top six factors are included, for clarity, in Box 3.

**Prevalence of critical pathways**

Critical pathways were in use in the workplaces of 68% ( $n = 47$ ) of the respondents, 64% ( $n = 30$ ) of whom were employed in the public sector and 36% ( $n = 17$ ) in the private sector, constituting a public to private sector ratio of 2:1. Box 4 shows that 26% ( $n = 12$ ) of respondents who reported that their facility used critical pathways were employed by country facilities, and the remaining 74% ( $n = 35$ ) by metropolitan facilities, a ratio of 1:3. There was a relatively balanced ratio (1:1.5) of pathway users in public sector metropolitan facilities ( $n = 20$ ) to users in private sector metropolitan facilities ( $n = 15$ ), whereas the ratio of users in public country facilities ( $n = 10$ ) to private country facilities ( $n = 2$ ) was 5:1.

Thirty-two percent ( $n = 22$ ) of respondents did not use critical pathways, 19 of whom were employed in the public sector and three in the private sector, a ratio of 6:1. There was a relatively even country–metropolitan distribution of the 22 non-users: 12

**5: Clinical coders who do not use critical pathways, according to employment sector and facility location**



(55%) were from country facilities and 10 (45%) from metropolitan facilities (Box 5).

**Effect of critical pathways on documentation factors**

Respondents indicated if they believed any of the five documentation factors that they had identified as affecting coding quality were improved, worsened or not changed through the use of critical pathways (Box 6), and they provided an explanation for their response.

For reasons of brevity in this article, results are discussed for the eight factors identified as having the greatest impact on coding quality. These were identified as the factors nominated by the greatest number of people in stage one of the study. Further details of the remaining factors are available on request from the first author.

**1. Identification of the principal diagnosis**

The majority of respondents who indicated that critical pathways effected no change in their ability to identify the principal diagnosis ( $n = 20$  public,  $n = 9$  private) stated that pathways are printed *proformas* of nursing care for specified procedures, that doctors do not write on them, and thus the principal diagnosis is not recorded thereon. While clinical coders in the public sector could locate the principal diagnosis elsewhere within the record, no private sector coders reported being able to do so.

All respondents who indicated that pathways had facilitated an improvement in the identification of the principal diagnosis were employed in the public sector. They gave two reasons: (i) the information obtained from the pathway is more specific than information from the traditional medical recording methodology(ies); and (ii) the pathway helps the coder to identify the appropriate principal diagnosis.

**6: Impact of critical pathways on documentation factors affecting coding quality (in ranking order of broader documentation effects on coding quality – see Box 2)**

	<u>Improved</u>	<u>Worsened</u>	<u>No Change</u>	<u>No response</u>
1. Identification of principal diagnosis	6	5	29	0
2. Identification of complications	21	4	5	1
3. Identification of associated diagnoses	6	1	17	1
4. Incomplete medical record content	4	4	13	1
5. Illegibility of medical record entries	10	2	9	0
6. Ambiguity of written entries	4	3	13	1
7. Identification of principal (first) procedure	6	0	12	0
8. Terminology used	2	3	5	0
9. Identification of investigations	1	0	8	0
10. Identification of other procedures performed*	0	3	5	0
10. Amount of handwritten entries/progress notes*	2	4	0	0
11. Bulk of records/volume of paperwork	4	3	3	0
12. Medical record format (physical layout)**	1	1	2	0
12. Abstraction time (time taken to abstract information from record for coding)**	3	2	1	0
13. Duplication of information within the record	0	0	3	0

\*Equal 10th ranking \*\*Equal 12th ranking.

The five coders who reported that pathways worsened the identification of the principal diagnosis ( $n = 1$  public,  $n = 4$  private) indicated that their pathways were procedure-based and without provision for recording the principal diagnosis.

**2. Identification of complications**

Similar reasons were provided by 21 ( $n = 11$  public,  $n = 10$  private) of the 31 coders who reported an improvement in this factor: potential complications are captured in the variance section of the pathway, providing an easier method of locating complications.

Those who reported that recording of complications had worsened ( $n = 4$ ) or had not changed ( $n = 5$ ) with the use of pathways gave the following explanations:

- pathway documentation is not as comprehensive as the traditional progress notes;
- pathways contain incorrect documentation of variances; and
- the “tick box” format of pathways makes it difficult for coders to establish if and when a complication has occurred.

A nil-change in the recording of complications was reported as being due to their being recorded elsewhere in the record (discharge summary, progress notes) and there not always being an appropriate place on the pathway for variance recording. It is possible that the predominance of responses from public sector clinical coders was due to the comparatively comprehensive and structured nature of documentation practices in public health care facilities, where junior medical staff members are responsible for much of the medical documentation.

**3. Identification of associated diagnoses**

Seventeen respondents ( $n = 12$  public,  $n = 5$  private) found that, regardless of the recording method used, the identification of associated diagnoses was problematic, thereby making it difficult for the coder to determine if the condition (i) is still being treated actively, and (ii) warrants coding.

Four distinct categories emerged as to why critical pathways did not change the identification of associated diagnoses.

- It is the doctor's responsibility to record associated diagnoses; therefore these are not written on pathways, which are completed by nursing staff.
- Associated diagnoses are documented in the past history section of the medical record, and unless current medications are linked to documented conditions it is impossible for the coder to determine which conditions are being treated actively.
- The associated diagnoses are recorded in the discharge summary and are substantiated in either progress notes or critical pathways.
- Documentation of associated diagnoses is dependent upon the correct use of the pathway by doctors and nurses.

**4. Incomplete medical record content**

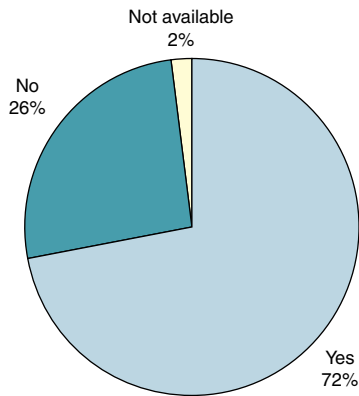
The majority of clinical coders in both sectors professed three reasons for why pathways had brought no change to the problem of incomplete medical record content:

- i. incomplete medical record content is due primarily to the lack, or illegibility, of doctors’ entries, which form no part of pathway documentation;
- ii. missing pathology and imaging reports are not in the record at the time of coding; and
- iii. there is poor medical recording compliance by clinical staff.

**5. Illegibility**

Clinical coders who reported improved legibility attributed this to the pathways being printed documents, while those who reported worsened legibility cited the reduced quantity of written notes as providing less opportunity to locate the term elsewhere and thus to improve their chances of deciphering it. Those who reported no change attributed this to the fact that the doctors in their facilities did not document on pathways.

**7: Percentage of clinical coders who use critical pathways for abstraction**



**6. Ambiguity of medical record entries**

Respondents believed that the introduction of the pathway recording methodology had reduced ambiguity, due to the uniformity of language incorporated into the pathways, and a decreased need for written entries.

**7. Identification of principal procedure**

The majority of respondents indicated that critical pathways effected no change in the identification of the principal procedure, as this could be achieved via the operation report and therefore was not dependent upon the presence of a pathway. The coders who reported improved procedure identification cited as reasons for this the procedure focus of pathways, and the title of the pathway being synonymous with the procedure performed.

**8. Terminology used**

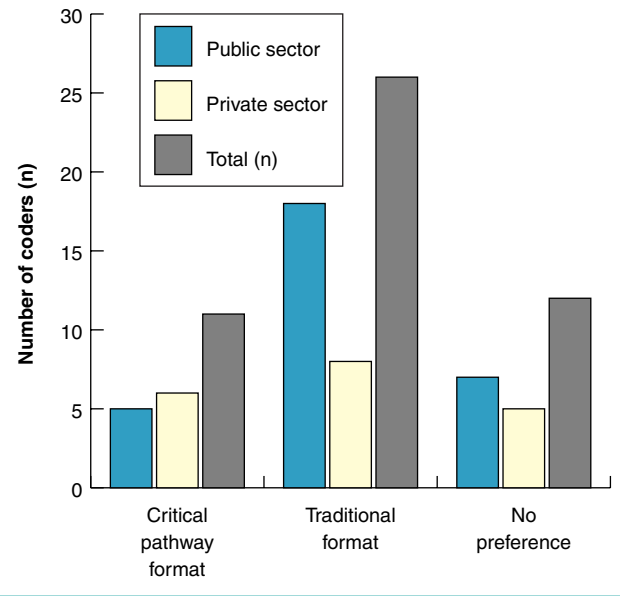
Clinical coders reported positively on the impact of uniformity of pathway terminology; however, ambiguous terminology was still seen as a problem in the hand-written variance notes. Coders found the "symptomatic nature" of nursing terminology to be problematic because it provides less specificity than medical terminology. Nurses complete the bulk of the pathway documentation, and this was reported to be the cause of terminology having deteriorated from the coders' perspective. It was stated that clinical documentation had decreased and this, coupled with the documentation by nurses on the variance page of vague signs and symptoms, had led to decreased accuracy in coding. Those coders who indicated that the use of critical pathways effected no change in the terminology used believed that this was due to the fact that pathways contain very little clinical terminology.

**Use of critical pathways for abstraction**

Seventy-two percent ( $n = 34$ ) of the respondents used critical pathways for abstraction (Box 7), two of whom "sometimes" used them for coding purposes, and one of whom used the "variance chart only". Twelve coders (26%) did not use critical pathways for abstraction

**8: Clinical coders' preferred recording methodology when coding**

\* Two respondents ticked both traditional medical record format and critical pathway format



and one indicated that the pathways were usually not available at the time of coding.

**Coder involvement in critical pathway development**

Whether or not coders contribute meaningfully to the development of critical pathways is presumably important for the utility of pathways in the coding process. Forty-eight percent ( $n = 29$ ) of respondents had no involvement in pathway development. Conversely, only 7% ( $n = 4$ ) of respondent coders contributed to aspects of developments such as the terminology used and the formatting, whereas 15% ( $n = 9$ ) were involved through managing pathway costing and printing, 13% ( $n = 8$ ) were consulted on the aspects of the pathway that related to Health Information Service use, and a further 12% ( $n = 7$ ) contributed via their membership of the Medical Record Committee.

**Coder education in data extraction methods**

A sizeable 89% ( $n = 42$ ) of clinical coders reported receiving no education on methods of data extraction from critical pathways. The remaining 11% ( $n = 5$ ) received some informal education from diverse sources, for example from a health information manager solely, or in conjunction with the Clinical Management Centre or the critical pathways co-ordinator (Nursing Division).

**Effect of critical pathways on coding consistency**

For the purposes of this research, "consistency" refers to achieving the same coded result regardless of which clinical coder codes the record. The respondents gave several reasons for the perceived reduction in coding consistency associated with their use of critical pathways:

- doctors do not write on pathways
- pathway documentation is unreliable due to clinical staff not using it properly
- there is lack of space on pathways for recording associated diagnoses
- the investigations performed are not always noted, thus coders do not know to seek out results
- pathways are complex.

Improvements to coding consistency through the use of pathways were attributed to the following factors:

- the decreased amount of paperwork, which also increases the speed of abstracting, and therefore of the coding process
- a reduction in the need for subjective interpretation by coders
- improved recording of complications due to variance documentation.

Two themes emerged from the coders' explanations of why pathways effected no change to the abstraction and coding process.

- The format of documentation is of little significance, because it is the information *per se* that is important to the coder. Pathways often replace only the progress notes and it remains necessary for the coder to abstract information from the discharge summary, admission assessment, operation report, and investigations and diagnostic results reports.
- The coder's interpretation and experience, rather than the actual documents, determine coding consistency. Inconsistency between coded data results not only from documentation factors but also from intercoder variation in knowledge, experience, use (and availability) of resources, and abstracting ability.

### The effect of critical pathways on coding accuracy

For the purposes of this research, "accuracy" was defined as the depiction, through code assignment, of the situation that occurred during the inpatient episode. Two reasons were given for pathways contributing to a perceived decrease in coding accuracy. Firstly, that the reduction in the descriptive nature of the documentation provides insufficient information to code accurately, and secondly, that inaccuracies in the completion of variance recording on pathways militate against coding accuracy.

Three themes emerged around the improvement of coding accuracy attributed to the use of pathways: (i) the simplified, standardised format of pathways; (ii) the identification and recording of complications on the variance chart; and (iii) coder ability (provided that the coder has the foundation knowledge to interpret and extract data from the pathway document).

Forty-five percent of respondents indicated that the standardised format of critical pathways had no bearing on the accuracy of coding, for the following key reasons.

- *Coding skills.* Whilst pathways may aid abstraction, code allocation is dependent upon adherence to classification rules, compliance with standards, and the individual coder's current knowledge of reference materials and changes.
- *The content and format of the documentation.* A change in documentation format will not result in

improved coding accuracy if doctors still fail to document in the medical record.

### Coders' preferred recording methodology

A number of different terms are associated with the general concepts of critical pathways. This was evidenced by participants referring to them as critical pathways, care tracks, clinical path(way)s, care maps, and care plans. It is the pathway "genre" that is important, as, regardless of the terms used, clinical coders prefer overwhelmingly the traditional medical record format for coding purposes, because it provides more comprehensive recording and a standard, easy-to-follow structure that contains medical documentation in the progress notes (Box 8). Critical pathways are nursing-focused: they are used primarily by nursing staff and, as "the responsibility for recording accurate diagnoses and procedures...lies with the clinician" (National Centre for Classification in Health 1998, p vii), coders are questioning whether a nurse can be defined as a "clinician" for clinical coding purposes. Many coders indicated that, until this issue is addressed, they would prefer to code from the traditional medical record format as opposed to a (pathway) format based primarily on nursing notes.

There appears to be no correlation between coders' preferred recording methodology and either their involvement in the development of critical pathways or their education in data extraction methods. Twenty-three percent ( $n = 11$ ) of the respondents preferred to code from critical pathways, because they perceive that they:

- provide clearer and more precise information
- earmark variances
- decrease the amount of documentation, as only ticks and initials are required against expected outcomes
- are more coherent, factual, summarised and accurate than the traditional medical record notes
- contain less repetitious information
- make abstraction and coding much faster.

The remaining 12 coders had no preference for either pathway or non-pathway recording methodology, because "both systems have merit". Five coders employed in the public sector and six from the private sector preferred the critical pathway format, whereas eighteen (60%) of public sector coders and eight (42%) of the private sector coders preferred the traditional format; the remaining coders from both sectors expressed no preference.

## Discussion

### Documentation factors affecting coding quality

The different style, format and content of pathways in use at various facilities affects the coding process in different ways and thus influences what coders identify to be benefits and deficiencies.

The stage two interviewees reported that pathways had been introduced to their facilities to control and monitor length of stay, keep patients on track for the expected discharge date, increase throughput, standardise care, and ensure the delivery to patients of best-practice care. Pathways had been introduced nei-

ther to assist with nor to improve documentation practices and problems, and this may account for the problems that coders encounter with pathway documentation.

The documentation factors identified by coders as having the greatest impact upon coding are predominantly doctor-related. It would appear from this, and from previously cited research, that the primary problems with recording in the medical record are due to doctors' poor documentation practices, barriers (albeit invisible) that accentuate professional boundaries, and poor design of medical record documentation. In their current format, critical pathways do not appear to address these issues, and sometimes can add to the problem. For critical pathways (or, indeed, any recording methodology) to become effective in meeting the needs of all stakeholders, teamwork needs to be fostered and professionals in different disciplines will need to drop the barriers to enable everyone to work together to achieve this goal.

The respondents made the following suggestions for changes to critical pathways to enhance their medical documentary value, and thus to improve their utility in the coding process:

- separating current associated diagnoses from the patient's past medical history;
- clarifying which medications are treating which associated condition(s); and
- incorporating a section into the pathway for doctors to document associated diagnoses.

Private sector coders identified two features of pathways as constituting improvements which enhance the identification of associated diagnoses: (i) that pathways have a dedicated section for recording associated diagnoses; and (ii) that relevant associated diagnoses are captured on variance forms within the pathway.

### Concepts, definitions and roles

Wilson's claim (Wilson 1997) that critical pathways typically are developed for high-volume, high-risk, and high-cost diagnoses and procedures was supported by the research findings. The following percentages represent the proportion of respondents who used pathways in these areas of high risk, volume and cost: total hip replacement (42.5%); normal vaginal delivery (36.2%); total knee replacement (36.2%); caesarean section delivery (27.7%); laparoscopic/open cholecystectomy (25.5%); hernia repair (17%); stroke/cerebrovascular accident (21.3%); asthma (12.8%); and cardiac surgery/cardioplasty (12.8%).

This study highlighted that, when the principal procedure was the main focus of the pathway, usually no provision was made therein for recording of the principal diagnosis or associated diagnoses. This singular focus of the pathway also resulted in no other procedures being identified on that particular pathway.

Critical pathways should feature comprehensiveness; that is, they should deal not just with doctors' decision making, but with the decision making, services and interactions of all clinical service providers. They should contain specific timelines for interventions and should be developed jointly by multiple health care professionals (Dykes & Wheeler 1997). Whilst

many critical pathways in respondents' facilities had been developed for client populations using a medical diagnosis ( $n = 36$ ), a surgical ( $n = 48$ ) or diagnostic procedure ( $n = 4$ ), or a therapy ( $n = 2$ ), it was noted that for the most part they were procedure based and nursing focused.

### Documentation policy

The documentation policies of individual health facilities determine different applications of critical pathways. For example, the pathway may or may not be considered to be part of the permanent medical record. It has been reported that the inclusion of pathways in patients' medical records reduces the time required for recording, especially by nurses (Carpenito 1995).

The clinical coders in this study reported that critical pathways in their facilities either incorporated other aspects of medical record documentation, or provided a documentation tool that was additional to the existing structure of the record. In facilities where the latter occurred, the pathway was seen to be more of a checklist for clinicians to ensure that the appropriate protocol for the diagnosis and/or procedure was followed rather than assisting from a coding perspective. It was reported that critical pathways rarely replaced other parts of the medical record; therefore documentation that is pathway related is redundant to other "charting"/recording activities.

The inclusion of critical pathways in the medical record was seen by respondents as complicating, or, conversely, improving record structure. The latter position was taken predominantly by private sector clinical coders. The former position is illustrated by coders' comments: pathways are hard to follow, complex in structure, generally take longer to read, and therefore are less useful than traditional medical records. Pathways have increased the bulk and complexity of medical records when used in conjunction with progress notes and the multitude of other record forms.

Those clinical coders who believed that the inclusion of critical pathways improved the structure of the medical record indicated that pathways provide an improved format that links complications with interventions. Traditionally, doctors write orders in the record each day; however, anecdotally, few doctors in private health care facilities write daily orders. Pathways extend the benefits of daily orders to private facility documentation practices by providing an integrated, overall plan for everyone to follow.

### Variations

Variance recording and analysis are essential to reap the full benefits of critical pathways, to legitimise documentation by exception, and to provide a highly individualised record of care. When variances are noted in a timely fashion, clinical investigations or corrective actions can be initiated sooner. Aggregate variance analysis enables clinicians to identify and view trends over time, make appropriate changes in practice to improve the effectiveness and efficiency of interdisciplinary care, and to assess the need for and to implement, where appropriate, changes to critical pathways (Schreifer 1995; Potter 1995).

Coders often can equate variances to complications and/or comorbidities for coding purposes, and thus they rely on the clear documentation of those occurrences to enhance coding accuracy. Variance documentation was reported mainly as having improved with the use of critical pathways; however, it was noted to be deficient at times for accurate code assignment due to the terminology used.

### Completion of pathway documentation

The critical pathways in Victorian health care facilities are predominantly nursing-based. Although practice guidelines and what otherwise would constitute doctors' orders are incorporated into the pathway structure, doctors appear to be reluctant to use the variance record, and thus their medical record entries are not part of the pathway documentation. The findings of Stead and Huckle (1997) indicate that it is doctors who have the most difficulty in complying with the completion of the pathway, and this was supported by the results of this study, which indicate that, as most doctors are not completing pathways, progress notes are still being used, adding additional paper and perhaps arguably causing duplication within the record.

It was apparent from the coders' responses that the lack of medical documentation is posing significant problems in code assignment. Inadequate or absent medical documentation was found by coders to be problematic with regard to the terminology used on pathways. When nurses document pathways they record nursing diagnoses. The lack of "definitive" diagnoses written in the record by doctors leaves the coder only the signs and symptoms written by nurses from which to code; thus, code selection is more difficult and often less precise. This, in turn, can be detrimental to the facility in terms of funding.

Allied health clinicians' involvement in the planning, development, and completion of pathways was less than optimal, and, when abstracting information from critical pathways, coders reported having to seek additional information from the progress notes for documentation by both medical and allied health clinicians. The results indicate that the majority of facilities at which the sample of coders was employed have failed to attain cooperation and support from all clinical professions in the development, use and revision of critical pathways.

### Limitations of the study

Consistency and accuracy were defined for the purposes of this research; however, it is possible that some respondents did not differentiate between the two concepts, as some answered questions with the same or similar answers, or transposed their responses. This is a limitation of the study.

### Conclusion

In a relatively short time, critical pathways have emerged amid claims that they are a means of improving the cost-effectiveness of health care while optimising patient outcomes. Where pathways are in use in Victorian health care facilities, the majority of clinical coders utilise them, at least in part, for coding purposes. It would appear, however, that during the

pathway development process the role of coders as key stakeholders and internal customers tends to be overlooked. Where facilities have not operationally defined coders' needs and incorporated them into the design of the pathway "product," critical pathways have little chance of being maximally useful. It would appear also that problems with the "process" of documentation have not been overcome, as duplication remains evident in medical record documentation. Nor have barriers been broken down between disciplines; this is evidenced by the perception that critical pathways are "nursing tools" and were rarely reported to contain documentation by doctors or allied health clinicians.

A fundamental component of all quality process endeavours is the capture and use of data to drive ongoing, systematic improvement. Systems that provide users with quality-related feedback are needed to drive data-based performance improvement and to provide measurable results. However, the urgency to develop critical pathways can overshadow data-related activities, and the creation of a data-based feedback loop can be omitted. These data are necessary to define case types, capture and understand variance patterns, and implement improvements. Without the requisite data, critical pathways become a guide to care that omits the most crucial element, a continuous improvement link that lets all users of the pathway know what is working and what is not in terms of both cost and quality.

While some coders reported excellent nursing compliance with pathway documentation, possibly due to nurses' involvement in pathway development, the majority indicated a need for more education and training to be provided to all users. If coders continue to be excluded from the education, development and revision process of critical pathways, they will not be able to contribute significantly to an improvement in documentation practices, and therefore to the quality of the coded data.

Clinical coders are accountable for the quality (and thus for the consistency, accuracy and timeliness) of coded data in an environment in which both the users and the uses of these data are continually increasing. In order to satisfy stakeholders' needs the coded data they are using as the basis of their research, planning, evaluation and costing must be accurate and reliable. Consistency and accuracy of coded data are dependent upon the interconnected processes that comprise the health care delivery system, of which the medical record is the foundation (Berwick 1996; Gillem 1988). The findings of this study indicate that clinician compliance in the completion of documentation remains an ongoing problem in health care facilities, and that the medical record format has not yet reached an optimal state. In consequence of these systemic deficiencies, the quality of clinical coding, which is dependent upon comprehensive and accurate medical records, must be called into question. Critical pathways do not reflect sufficiently adequately, for clinical coding purposes, the clinical and related care functions of an interconnected group of health care professionals; nor do they provide an improved system of medical record documentation.

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