

Documentation and coding of medical records in a tertiary care center: a pilot study

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BACKGROUND: Since the medical record is the major source of health information, it is necessary to maintain accurate, comprehensive and properly coded patient data. We reviewed 300 medical records from patients at King Faisal Specialist Hospital and Research Center, representing four departments (medicine, surgery, pediatrics and obstetrics and gynecology).

METHODS: The records were audited following the guidelines of the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) for accuracy and completeness of documentation and coding of primary and secondary diagnoses and procedures performed.

RESULTS: Of 1051 items abstracted, 876 (83.3%) were accurately documented, 41 (3.9%) were inaccurately documented, and 134 (12.7%) were not documented. Of the items abstracted, 736 (70%) were assigned a correct code, 110 (10.5%) were assigned an incorrect code, and 205 (19.5%) were not coded. More items classified as accurately documented were coded correctly (71.1%) than items inaccurately documented (49.7%) ($P < 0.0001$). The difference in comprehensiveness of documentation, which reflects physician performance, was not statistically significant among the four departments (P value < 0.234). The difference in the accuracy of coding, which reflects coder performance, was statistically significant (P value < 0.036).

CONCLUSIONS: Only 60% of the audited records met the benchmark for good quality medical records with regards to documentation and coding. A positive correlation between the accurate documentation and correct coding was noted, which supports the conclusion that high quality documentation enhances coding accuracy. These data, although encouraging, suggest room for improvement, which can be achieved through the collaboration of clinicians, who have extensive clinical experience, and coding professionals, who have comprehensive classification system expertise.

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The core of the health information system in the hospital lies in the medical records.¹ As a primary means of communication between health care workers, a properly documented medical record is essential to good clinical care.²⁻⁵ Coding is classifying data and assigning a representation for these data. Clinical coding is assigning numbers to diagnoses and procedures for retrieval, research and reimbursement purposes.⁶ The most common coding system used to code hospital inpatients is the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) system.⁷ This will soon be replaced by the tenth revision (ICD-10-CM).⁸ The coding process involves steps that include a review of the medical record, selection of items to code, assignment of the code, sequencing of the code, abstracting, entry, storage and retrieval of the coded data in a database.

Accurate diagnostic and procedural coding cannot be attained without clear and complete documentation.⁹ Maintaining good standards of clinical documentation remains a problem in the health service. Little is known about the documentation and coding errors in the medical records at King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia (KFSHRC). We examined the frequency and sources of errors.

Materials and Methods

From the Medical Records Department at KFSHRC, we randomly retrieved 300 charts from four medical departments (medicine, surgery, obstetrics and gynecology, and pediatrics) that were coded between April and June 2001. The charts were audited by a physician (JF) for completeness and accuracy of documentation and coding of primary diagnosis, secondary diagnoses, and procedures during the last patient admission in the face sheet, the discharge summary, discharge order sheet and, in pediatrics and obstetrics and gynecology, the delivery data sheet. The primary diagnosis in each chart was considered one "item". Any secondary diagnosis or procedures were considered an additional "item". Each item was classified as documented, not documented or inaccurately documented. Using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) system,⁷ each item was audited for accuracy and completeness of the assigned code. Each item was classified as coded, not coded or inaccurately coded.

A Microsoft Access database was designed to record the medical record number, the type of diagnosis (primary, secondary) and procedures performed in that admission. A scoring system was developed, with scores from 0-8: eight for items both documented and coded, and zero for items neither documented nor coded (Table 1). A score of eight was assumed to be the benchmark for good quality. However, the remaining numbers of the score do not reflect a descending/ascending rank of quality. The scoring system was arbitrary, created by the authors only for easy interpretation of data. All data were analyzed using SPSS software for Windows (SPSS Inc., Chicago, IL, USA). The Pearson chi-square correlation coefficient was used to calculate the 2X2 crosstabs.

Results

Of the 300 charts reviewed, 73 were from medicine, 57 from surgery, 96 from pediatrics, and 74 from obstetrics and gynecology. One thousand and fifty-one

Table 2. Items abstracted and accuracy of documentation and coding.

	Number	Percentage
Item abstracted		
Primary Diagnosis	300	28.5
Secondary Diagnosis	454	43.2
Procedure	297	28.3
Total	1051	100
Documentation		
Documented, accurate	876	83.3
Documented, inaccurate	41	3.9
Not documented	134	12.7
Total	1051	100
Coding		
Coded, correct	736	70.0
Coded, incorrect	110	10.5
Not Coded	205	19.5
Total	1051	100

items were abstracted. Primary diagnoses constituted 300 (28.5%) of the items abstracted, secondary diagnoses 454 (43%), and procedures 297 (28.3%). Of the 1051 items, 876 (83.3.0%) were accurately documented, 41 (3.9%) were inaccurately documented and 134 (12.7%) were not documented. Seven hundred thirty-six (70%) of the items were assigned a correct code, 110 (10.5%) items were assigned an incorrect code, and 205 (19.5%) items were not coded (Table 2). Of the 876 items classified as 'documented, accurate,' 649 (71.1%) were coded correctly (met a score of 8), as compared with 87 (49.7%) from the 175 items classified as 'documented, inaccurate' ($\chi^2=41.3$; $P=0.0001$). The items with a score of 8 represented 61.8% of the total of 1051 items. The distribution and completeness of documentation among departments is shown in Table 3. The difference in the accuracy of documentation between departments, which reflects physician performance, was not statistically significant (P value <0.234). The accuracy of coding was the highest in the charts of the pediatrics department (74.7%), followed by obstetrics and gynecology (71.1%), medicine (69.2%), and surgery (63.2%). This difference was statistically significant (P value <0.036) (Table 3). The number and percentage of correctly documented and coded primary and secondary diagnoses, and procedures is shown in Table 4.

Table 1. Scoring system for measuring quality of coding and documentation.

		Documentation		
		Correct	Incorrect	Not documented
Coding	Correct	8	5	2
	Incorrect	7	4	1
	Not coded	6	3	0

Discussion

This study shows the degree of documentation completeness, coding accuracy, and the quality of our medical records. Only 61.78% of audited medical records met the benchmark for good quality of medical record (a score of eight). The coding errors (incorrect coding, not coded) (30%) which might reflect coder performance, exceeded the documentation errors (inaccurate documentation, not documented) which reflect physician performance (16.6%) (Table 2). When compared to a study done by Lloyd et al. at the Veterans Administration Medical Center in Augusta, GA, where 1829 medical records were reviewed, physicians were the source of errors in 62% of the cases, and coders were the source in 35% of cases.¹⁰ Differences between physician performance across the four departments in this study were not significant, implying a higher level of concordance between physicians when compared to coders, in whom differences in performance across the four departments were statistically significant. The performance of the coders was the lowest in charts audited for the department of surgery. This variance could be related to the coders' level of education and training as well as increased complexity of medical records and terminology in the department of surgery. These results mandate a closer look and future studies to improve the accuracy of chart review and abstraction skills.¹¹⁻¹⁵ The slight positive correlation between accurate documentation and correct coding was noted in our study could support the conclusion that high quality documentation enhances coding accuracy.^{4,16}

Physicians more accurately documented primary diagnoses than either secondary diagnoses procedures (Table 4). Physicians tend to undervalue the extra time and services provided to other secondary problems dealt with during hospitalization, which results in undercoding of such problems.⁹ When analyzing the coded data, the same statistical trend was demonstrated, stressing the fact that accurately coded data originate from accurate documentation. Failure to list the diagnosis, failure to use the proper ICD-9 terminology, and to abide by the documentation guidelines were noted as a source of error, but were felt to have a negative influence on medical record documentation and coding quality.¹⁷⁻²³ Documentation guidelines are still problematic and evolving. What is needed are clear and unambiguous guidelines to streamline the documentation and coding process,²¹ which might explain the skepticism that surrounds the new Health Care Financing Administration (HCFA) guidelines.^{3,5,23-26}

Table 3. Documentation and coding by department.

Department	Number of items abstracted	Number of items accurately documented	Number of items correctly coded
Medicine	253 (24.1%)	220 (87.7%)	175 (69.2%)
Obstetrics and Gynecology	279 (26.5%)	227 (81.4%)	200 (71.7%)
Pediatrics	288 (27.4%)	234 (81.3%)	215 (74.4%)
Surgery	231 (22.0%)	195 (84.4%)	146 (63.2%)
Total	1051 (100%)	876 (83.3%)	736 (70.0%)

P value <0.234, for difference in documentation between departments.

P value <0.036, for difference in coding between departments.

Table 4. Correct documentation and coding by primary diagnosis, secondary diagnosis and procedure.

	Documented, Correctly (%)	Coded, Correctly (%)
Primary Diagnosis	269 (89)	222 (74.0)
Secondary Diagnosis	353 (77.8)	292 (64.3)
Procedure	254 (85.5)	222 (74.7)

One limitation of this study is that the audit was done by physicians only and was not challenged by non-physician auditors, bearing in mind the possibility that physician auditors view documentation differently from non-physician auditors. A recent study carried in a family practice setting by Zuber TJ and colleagues found that coders differed significantly (*P* value <0.001) from the faculty and resident physician in their agreement with the code selected by medical providers.²¹ This difference was due to variance in abstractor assumption and interpretation.^{13,21} Another issue is whether chart review and abstraction of data, quantitative measurements, measure quality of data and patient care.²⁷

In summary, only 60% of the audited records met the required standards for a good quality medical record. The positive correlation between accurate documentation and correct coding supports the conclusion that high quality documentation enhances coding accuracy. These data, although encouraging, suggest room for improvement. This can be achieved through better collaboration of clinicians, who have extensive clinical experience, and coding professionals, who have comprehensive classification system expertise.²⁸

References

1. Kang S, Kim KA. **Medinfo**. 9 Pt 1:75:9, 1998.
2. DeParle NA. From the Health Care Financing Administration. Evaluation and management services guideline. **JAMA**. 2000; 283: 3061.
3. Braun P, Hsiao WC, Becker ER, DeNicola M. Evaluation and management services in the Resource-Based Relative Value Scale. **JAMA**. 1988; 260: 2409-2417.
4. Holzer S, Wachter W, Altmann U, Schweiger R, Dudeck J. Structured clinical documentation for the assessment of medical care. *Studies in Health Technology and Informatics*. 2000; 77: 480-483.
5. Murphy BJ. Principles of good medical record documentation. **J Med Pract Manage**. 2001; 16: 258-260.
6. Finnegan R. Coding Notes and DRG changes. **J Am Med Record Assoc**. 1988; 59(6): 23.
7. International Classification of Diseases, Ninth Revision, Clinical Modification. Washington, DC: Superintendent of Documents, US Printing office. 1980; 1-3.
8. Rode D. Taking the next step forward for ICD-10. **JAHIMA**. 2004 Jan; 75(1):14-15.
9. Wojcik C. Coding, documentation and dollars. **JAHIMA**. 1993; 64: 74-84.
10. Lloyd SS, Rissing JP. Physician and coding errors in patient records. **JAMA**. 1985; 254: 1330-1336.
11. Austin P, Stanfill MH. Ethical coding in the physician office. **JAHIMA**. 2001; 72: 65-67. **AHIMA**. 2000; 71: suppl.
13. Allison JJ, Wall TC, Spettell CM, et al. The art and science of chart review. Joint Commission. **J Qual Improvement**. 2000; 26: 115-136.
12. American Health Information Management Association. Standards of ethical coding. **J Comm J Qual Improv**. 2000; 26: 115-136.
14. Mogli GD. Standards for medical record services. **IHRIM**. 2000; 41: 24-27.
15. Johns M. A crystal ball for coding. **J AHIMA**. 2000; 71: 26-33.
16. Danzi JT, Masencup B, Brucker MA, Dixon-Lee C. Case study: clinical documentation improvement program supports coding accuracy. **Top Health Inf Manage**. 2000; 21: 24-29.
17. Mogli GD. Role of International Classification of Diseases in medical record management. **IHRIM**. 1997; 38: 28-32.
18. Clarification of clinical data sets, vocabularies, terminologies, and classification. AHIMA's Coding Policy and Strategy Committee. **JAHIMA**. 1999; 70: 72-73.
19. Zuber TJ, Purvis JR. Coding and reimbursement of primary care debridement and excision procedures. **J Fam Pract**. 1992; 35: 663-672.
20. Zuber TJ, Purvis JR. Coding and reimbursement of primary care biopsy and destruction procedures. [see comments.]. **J Fam Pract**. 1992; 35: 433-441.
21. Zuber TJ, Rhody CE, Muday TA, et al. Variability in code selection using the 1995 and 1998 HCFA documentation guidelines for office services. *Health Care Financing Administration*. **J Fam Pract**. 2000; 49: 642-645.
22. Bridges-Webb C. Classifying and coding morbidity in general practice: validity and reliability in an international trial. **J Fam Pract**. 1986; 23: 147-150.
23. Lezzoni LI, Foley SM, Daley J, et al. Comorbidities, complications, and coding bias. Does the number of diagnosis codes matter in predicting in-hospital mortality? [see comments.]. **JAMA**. 1992; 267: 2197-2203.
24. King SB, III. President's page: Evaluation and management documentation guidelines: proving accountability or just increasing hassle? [erratum appears in *J Am Coll Cardiol* 1999 Jun;33(7): following 2197.]. **J Am Coll Cardiol**. 1999; 33:895-896.
25. Sumkin J. The coding audit. [see comments.]. **Ann Int Med**. 1998; 128: 502.
26. Wood DL. Documentation guidelines: evolution, future direction, and compliance. **Am J Med**. 2001; 110: 332-334.
27. Luck J, Peabody JW, Dresselhaus TR, Lee M, Glassman P. How well does chart abstraction measure quality? A prospective comparison of standardized patients with the medical record. **Am J Med**. 2000; 108: 642-649.
28. Practice brief. Preparing your organization for a new coding system. American Health Information Management Association. **JAHIMA**. 1998; 69:suppl.