Are Physicians Adequately Educated in Medical Information Practices? A National Assessment of Coding-Related Documentation Training

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Introduction

How much training do physicians receive in proper documentation practices related to the classification of medical data? What are the potential ramifications of documentation practices on health services information across the U.S.?

Traditional classification and coding practices for medical data management have been criticized for providing a one-dimensional view of the patient and their medical condition, since it is through the use of descriptive text, notes, diagrams, and drawings that the healthcare information repository adds richness to the overall depiction of the medical patient. With the growing adoption of data-driven decision support systems, along with greater dependence on coding and classification of data used in the clinical practice of medicine, there is inevitably some loss of personalized, provider-specific information in the name of standardized, uniform data collection and management .[1].

With the emergence of evidence-based, data-driven medicine in the U.S., the presentation of the patient, and ultimately the organization's measured quality of care, is increasingly reliant on aggregated data, rather than measures of patient-specific processes and outcomes. This data is commonly maintained on computerized information systems, and is dependent on consistent data classification and entry in order to serve as a tool in the overall delivery of care. Determining how to measure quality and organizational performance, then, remains a key factor in continuing the provision of quality care, as the implementation of classification systems in healthcare delivery settings continues to emerge.[2]. Perhaps more importantly, the identification and measurement of small area and regional variation in coding practices may likewise provide challenges to full-scale adoption of an information-based healthcare system, since inconsistent data classification ultimately leads to inaccurate comparative data.

Traditionally, coding and classification of medical record data was performed by medical records personnel, who relied on sets of large paper books containing the many codes and their definitions. The "coder" would scan the medical record, check the coding manuals, , make a judgment on what the likely diagnostic code was (e.g. 337.3, autonomic dysreflexia), and record it somewhere it could be accessed by the billing department and "grouped", or assigned a reimbursement (DRG) code (e.g. 18 or 19). This information was then listed on the bill or invoice form. Where information was incomplete or ambiguous, consultation with the treating physician was recommended.

Increasingly, such systems now task healthcare providers to serve as initiators of primary patient information on bedside and office-based medical records systems. Also, systems are being developed where data entry and classification becomes a unified process, requiring separate coder intervention only for complex or ambiguous cases. Regardless of the type of system used, providers are inevitably becoming a primary source of data entry. [3]

New processes and methods related to virtual organizational management are likewise being developed to meet the rapidly changing structure of the workplace environment. Advances in telemedicine, as well as changes in attitudes related to employee telecommuting, also are serving to separate managers from their traditional methods of face-to-face meetings, immediate interaction with other organizational members, and other management methods derived from centuries of work in physical organizational structures. For such a data-intensive environment to be effective, however, the minimization of documentation error is critical.[4]

How widespread is the problem of poor medical data in the U.S. healthcare system? According to a recent audit of Medicare-based reimbursement, the Office of Inspector General (OIG) of the Department of Health and Human Services (HHS) found a 5 percent annual increase in erroneous payments to physicians, attributed to data-based flaws or lack of data documentation. Fifty-two percent of all Medicare documentation-related incorrect payments were made to physicians and hospital outpatient services in this audit, up from 47 percent in the previous year. Inadequate or inappropriate data documentation also was the top reason for erroneous payments to physicians. [5,6]

The same audit showed that acute care hospitals participating in a prospective payment system received $4.1 billion in incorrect payments. Physicians received approximately $5 billion in incorrect payments during the same time frame, a $900 million increase over the previous year. In this audit, the most common reason for improper physician payments was that physicians received payment without providing complete data, as required by Medicare regulations. Such inadequate documentation was found to result from such practices as failing to complete a demographic data element on forms, or failing to provide rudimentary clinical findings for a given case.[7]

More troubling is the fact that incorrect coding accounted for almost 15 percent of the total improper payment made by Medicare; more than 90 percent of those payments were made to physicians. This is almost double the amount improperly paid due to incorrect coding as compared to the previous year. Although the reimbursement aspects of incorrect coding are apparent, systematically identifying the causes and remedies remains a problem for medical systems developers. [8]

Traditionally, information managers have been charged with ensuring accuracy, requiring appropriate education and training, and communicating timely and appropriate data definitions to those who collect data. Managers are likewise charged with ensuring that appropriate edits are in place to guarantee accuracy. Ultimately, however, it is the interpretation of the provider that determines the correctness of primary source data on such systems. Further, with the advent of a variety of large-scale integrated data warehouses, including forthcoming genetic databases, not only has the complexity of health information greatly expanded, but the sheer volume of data has increased exponentially. Healthcare providers and provider organizations must be able to facilitate accuracy, determine documentation needs, and focus on the rationale for collecting certain clinical data elements. [9]. To be effective as a clinical tool, however, it remains to be seen whether individual providers will be able to adequately recognize and manage true clinical variations in coded data, which in fact may be disguised by variation in data quality or classification inconsistency.

Clinicians continue to assume greater responsibility for both collecting and coding clinical data. Within their organizations, this same group translates clinical information into meaningful data and evaluates, analyzes, and maintains its accuracy, validity, and consistency. In effect, an ever-growing number of providers are responsible for the creation and maintenance of information quality. In an evidence-based environment, more expertise in data evaluation is invariably required, especially in coded data assessment, where the ability to distinguish variation in clinical quality from variation in data consistency is becoming a function of clinical practice [10].

To date, research in the area of medical data quality has, for the most part, focused on the improvement of coding mostly as it relates to financial outcomes, rather than addressing the overall coding process itself. The environment for most studies has been a paper-based system where data is classified primarily by human review and judgment. In such an environment, this classified and coded data served as a historical record of an individual patient's treatment. [11] In today's network-based healthcare system, however, there are a growing number of uses for coded data, far beyond reimbursement applications. Coded medical data has taken on a greatly expanded function, now being used more frequently as the basis for clinical decision support systems that act as medical consultants in the routine treatment and care of patients. Such a role requires data of the highest quality possible, since errors in data can routinely lead to errors in medical care. [12]. The level and quality of information classification in such an environment remains critical in creating a high-quality evidence environment.

Within such a data-driven setting, this study is one attempt to determine, on a national level, the amount of training received by physicians regarding proper documentation techniques in support of coding and classification of medical data.

Data and Methodology

Data from a nationwide survey of healthcare information managers, the AHA Annual Survey, the U.S. census, Interstudy publications, state and regional health service departments, and *The Market Statistics Report* were used to examine the organizational and environmental characteristics of data quality in a variety of healthcare settings. A comparison of selected data quality characteristics was made across practice settings, geographic areas, and selected healthcare demographic characteristics.

The survey data included measures of the quality of the level of training in medical record documentation and the existence of selected organizational characteristics relevant to good data quality assessment practices.

Design and Methodology

The survey, completed in May of 1999, was a response to the need of the healthcare industry for more timely and frequent practice information in the field of health information management No comprehensive study of this kind has been available in the past.

The goal of this undertaking was to establish a source of practical, comparative information that can be used in both strategic planning and day-to-day practice. This project was designed to allow ready access to ideas and innovations that other professionals have used in solving management and technology problems common to many organizations. As such, this study was designed to ultimately provide periodic information on information management as it relates to coding of information and data quality.

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Sample Design

The initial survey was initially fielded in June 1998, with follow-up assessments accomplished through May 1999. It was designed to provide representative information on the population of health information managers. The sample included respondents from a variety of practice settings and job titles and excluded students. The survey obtained data from 16,591 health information managers, for a 50.4 percent gross response rate

Samples for surveys were selected from a database of certified health information managers provided by the Foundation for Record Education (FORE), and contained current and historical information on RRA/ART credentialed information professionals in the United States. The data included on the population surveyed were obtained primarily from membership renewal forms and from an annual member profile mailed to all active members. Preferred mailing address data were obtained from the member population from those members with changes in address or professional status. These changes may be signaled by input from periodic mailings or by other correspondence.

Questions for the main questionnaire were developed from a review of past surveys and focus group results. Questions in the survey were designed so that managers from a variety of practice settings and work roles were asked questions that were generally relevant to the profession overall.

Topics were formulated and pre-tested by convened groups of practicing information managers, designed to represent a broad range of activity areas. Questions that had not been used previously in any known surveys of health information professionals were pre-tested prior to the survey fielding to evaluate the wording and ordering of questions and to determine the ability of respondents to provide the desired information.

Field Procedures

Prior to the survey mailing, announcements were made through professional publications and meetings to inform members of the upcoming survey. A preprinted questionnaire was mailed to all credentialed health information managers who had identifiable mailing addresses. An instruction letter accompanied the form and explained the purpose of the survey and instructions for completion. At the six-week point following the last wave of the initial mailing, a second mailing was sent to those who had not responded. Follow-up on specific issues identified after the second mailing was accomplished as a series of more focused studies.

The questionnaires were processed by an independent testing and research firm, National Computer Systems of Minneapolis, MN, which processed forms weekly over the length of the study. Region-specific response rates were tracked to ensure that the mailings were received in a timely manner.

Strict adherence to confidentiality standards was maintained in this study. Data were entered via a computerized scanning system and released only in aggregate form, without individual respondents identified within the reported results. In addition, a number of data quality control measures were employed to provide the cleanest possible data. A detailed review was made of all sample response dispositions, both pending and final, on a weekly basis. From this evaluation, the time schedule was reviewed and necessary recommendations were made to the contractor to enable the survey to be completed during the allotted field period.

As part of the post-survey program review, the design and methodology were examined to identify areas needing improvement. After data entry was complete, an evaluation was made of the impact of survey and item non-response rates and various potential methods for adjusting results to correct for non-response.

In the process of collecting demographic and practice setting information on health information managers, they were asked the following:

On average, how many hours of training per year do your physicians receive regarding proper documentation techniques related to coding?

Results

The level of coding-related education perceived to exist across the healthcare community remains less than adequate, with training of physicians in proper documentation techniques largely perceived as inadequate. A large majority of respondents (about 82 percent) report that physicians in their organizations received two hours or less of training in proper documentation techniques. Thirty percent report that physicians receive no training at all.

Table 1
Overall Hours Of Training Per Year

	TOTAL (A)
BASE: THOSE RESPONDING	100%
0	30.3
LESS THAN 1	25.7
1-2	26.2
3-4	8.6
GREATER THAN 4	9.2
MEAN	1.3
MEDIAN	0.7

Generally, metropolitan area respondents are more likely to report no training of physicians than rural area respondents. Within the metropolitan areas, however, it is small city area (250k-1 million) respondents who are most likely to report no training. 33.5% of this group reported no training. In contrast, 31.6% of those in large cities (over 1 million) reported no training.

Table 2
Hours Of Training Per Year, By Population Area

		NON-METRO		METRO		
	TOTAL (A)	**< 25K** (B)	**25K-49.9K** (C)	**<250K** (D)	**250K-1MIL.** (E)	**> 1MIL.** (F)
BASE: THOSE RESPONDING	100%	100%	100%	100%	100%	100%
0	30.3	23.9	27.8	28.2	33.5 D	31.6 D
LESS THAN 1	25.7	26.3	26.5	26.1	26.0	24.0
1-2	26.2	30.3	28.9	27.7 E	23.5	25.6
3-4	8.6	10.4 C	7.5	8.8	8.1	8.8
GREATER THAN 4	9.2	9.1	9.2	9.1	8.9	10.0
MEAN	1.3	1.4	1.3	1.3 E	1.2	1.3 E
MEDIAN	0.7	0.9	0.8	0.8	0.6	0.7

* Letters within cells indicate t-test significance between cells at ($p<.05$).

There appears to be a direct association between managed care penetration and no physician coding training. “No training” responses ranged from 26.8% for minimal penetration areas (10% or under), up to 32.9% for maximum penetration areas (over 30%).

Table 3
Hours Of Training Per Year, By Percent HMO Enrollment

	PERCENT HMO ENROLLEE			
	1% - 10% (G)	**11% - 20%** (H)	**21% - 30%** (I)	**OVER 30%** (J)
BASE: THOSE RESPONDING	100%	100%	100%	100%
0	26.8	30.9 G	32.5 G	32.9 G
LESS THAN 1	26.1	24.7	25.4	27.2
1-2	28.5 IJ	26.7 J	25.2	22.5
3-4	9.1	8.2	8.1	8.6
GREATER THAN 4	9.4	9.5	8.8	8.8
MEAN	1.3 IJ	1.3	1.2	1.2
MEDIAN	0.8	0.7	0.6	0.6

Mid-sized hospitals likewise reported the worst coding training. 33.4% of respondents in hospitals with 30-98k inpatient visits reported no coding training for physicians. 32.2 % of respondents from hospitals with over 98k inpatient visits reported no coder training.

Table 4
Hours Of Training Per Year, By Hospital Visits

	HOSPITAL INPATIENT VISITS				HOSPITAL OUTPATIENT VISITS			
	1-10,5K (K)	**10,501-30K** (L)	**30.1K-98K** (M)	**OVER 98K** (N)	**1-10,5K** (O)	**10,501-30K** (P)	**30.1K-98K** (Q)	**OVER 98K** (R)
BASE: THOSE RESPONDING	100%	100%	100%	100%	100%	100%	100%	100%
0	26.3	30.7 K	33.4 K	32.2 K	26.2	29.1 O	31.7 O	33.0 OP
LESS THAN 1	26.7 N	25.5	26.4	23.9	26.3	25.1	26.9	25.0
1-2	29.8 LMN	25.2	23.0	25.4	29.7 QR	28.0 QR	23.9	24.1
3-4	8.8	8.8	8.1	8.6	9.1	9.1	7.9	8.4
GREATER THAN 4	8.4	9.7	9.1	9.8	8.8	8.7	9.6	9.5
MEAN	1.3 M	1.3	1.2	1.3	1.3	1.3	1.3	1.3
MEDIAN	0.8	0.7	0.6	0.7	0.8	0.8	0.6	0.6

Generally, hospitals in large metropolitan areas (over 1 million) and those with more inpatient and outpatient visits tend to report more than 4 hours of coding training for physicians. Variation across this category was fairly small, however, and generally not significant.

Metro area respondents with a population density of <250K (mean hours = 1.3) and greater than population areas over 1 million (mean hours = 1.3) reported a significantly higher average than metro area respondents with a population density of 250K-1 MIL. (mean hours = 1.2), regarding the hours of training per year physicians receive in proper documentation techniques, related to coding.

Respondents with 1-10% HMO enrollees (mean hours = 1.3), on average, are significantly different from respondents with 21% and over HMO enrollees, regarding the hours of training physicians receive for proper documentation techniques related to coding.

Also of interest here, respondents with 1-10,5K hospital inpatient visits (mean hours = 1.3) on average have slightly higher training hours, compared to respondents with 30.1K-98K hospital inpatient visits (mean hours = 1.2), regarding hours of training physicians received regarding proper documentation techniques related to coding.

The average number of hours of training physicians receive is also significantly different for respondents with little or no managed care expenditures (mean hours = 1.3) compared to respondents with over $150 managed care expenditures.

Table 5
Hours Of Training Per Year, By Managed Care Expenditures

	MANAGED CARE EXPENDITURES			
	0 (S)	**1 - 125** (T)	**126 - 150** (U)	**OVER 150** (V)
BASE: THOSE RESPONDING	100%	100%	100%	100%
0	27.0	30.7 S	31.4 S	34.2 SU
LESS THAN 1	27.4 UV	25.7	24.7	24.4
1-2	28.0 UV	26.8	25.2	23.9
3-4	8.9	7.5	8.5	8.8
GREATER THAN 4	8.8	9.3	10.2	8.6
MEAN	1.3 V	1.3	1.3	1.2
MEDIAN	0.8	0.7	0.7	0.6

Also of note here, clinic setting physicians were reported to receive 2 hours of training per year, on average, regarding proper documentation techniques related to coding. This is significantly different from hospital (mean hours = 1.3) and "Other" (mean hours = 1) practice setting respondents.

Table 6
Hours Of Training Per Year, By Practice Setting

	HOSPITAL (B)	**CLINIC** (C)	**OTHER** (D)
BASE: THOSE RESPONDING	100%	100%	100%
0	25.5 C	17.2	48.8 BC
LESS THAN 1	29.1 CD	18.0	19.8
1-2	28.5 D	30.5 D	17.8
3-4	8.3 D	16.6 BD	6.1
GREATER THAN 4	8.5	17.8 BD	7.5
MEAN	1.3 D	2.0 BD	1.0
MEDIAN	0.8	1.9	0.1

The average number of hours of training physicians receive for proper documentation techniques related to coding in the East South Central region (mean hours = 1.5) is significant when compared to the Mid Atlantic (mean hours = 1.2), East North Central (mean hours = 1.2), Mountain (mean hours = 1.1) and Pacific (mean hours = 1.0) regions.

Table 7
Hours Of Training Per Year, By Region

	NEW ENGLAND (G)	MID. ATLANTIC (H)	E. NO. CENT. (I)	W. NO. CENT. (J)	SO. ATLANTIC (K)	E. SO. CENT. (L)	W. SO. CENT. (M)	MOUNTAIN (N)	PACIFIC (O)
BASE: THOSE RESPONDING	100%	100%	100%	100%	100%	100%	100%	100%	100%
0	32.5	32.5 L	29.1	26.7	28.5	25.6	28.8	29.7	33.4 JL
LESS THAN 1	22.9	27.0	28.1	24.9	23.9	24.0	25.0	34.1 GJKLM	31.8 GJKLM
1-2	27.1	25.5	25.6	32.0 HINO	28.5 NO	28.9 NO	9.1 NO	19.9	21.2
3-4	10.2	6.8	9.2	9.6	9.0	9.1	7.7	10.6	7.5
GREATER THAN 4	7.2	8.1	7.9	6.8	10.1 NO	12.3 IJNO	9.5	5.7	6.1
MEAN	1.2	1.2	1.2 O	1.3 O	1.4 HNO	1.5 HINO	1.3 O	1.1	1.0
MEDIAN	0.7	0.6	0.7	0.8	0.8	1.0	0.8	0.6	0.5

There is also a significant difference for those organizations that have merged (mean hours = 1.3), compared to those that have not merged (mean hours = 1.2), when examining the average number of hours physicians receive training on proper documentation techniques related to coding.

Table 8
Hours Of Training Per Year, By Merger Status

	MERGER (P)	NO MERGER (Q)
BASE: THOSE RESPONDING	100%	100%
0	28.0	31.5 P
LESS THAN 1	26.3	25.7
1-2	26.6	25.9
3-4	9.3	8.3
GREATER THAN 4	9.7	8.6
MEAN	1.3 Q	1.2
MEDIAN	0.8	0.7

Discussion

As seen here, training in proper documentation by physicians was limited to a few hours in most organizations, though it varied significantly across practice settings, organizational characteristics, and geographic locations. When coded data is utilized by either physicians or managers to assess clinical performance, such variation could have a significant impact on perceived performance effectiveness. On a national level, researchers or policymakers who rely on coded data in comparative studies, across geographic regions or disparate healthcare markets, may be faced with inherent, significant variation in data, which may in fact overshadow actual variation in healthcare quality, clinical effectiveness, or medical outcomes.

Providers are increasingly being called upon to meet the challenges of contributing to a meaningful database that accurately depicts patient mix and resource use. As long as diagnostic and procedural coding serves as the basis for patient information systems, the accuracy of clinical coding will be critical. Ensuring the accuracy of coded data is thus an increasingly important responsibility of clinicians. In an evidence-based healthcare environment, traditional roles of physician coding may prove ineffective, as providers assume greater responsibility for overall data accuracy and task-specific data quality management, such as electronic claims authentication.

Most significantly, complex reimbursement requirements, administrative simplification laws, and accreditation standards now require that final diagnoses and procedures are recorded in the health record and authenticated by healthcare practitioners. Physician documentation, in its entirety, is the cornerstone of accurate coding. In the past, meaningful diagnostic and procedural data originated from the collaboration between clinicians with extensive clinical experience and coding professionals with comprehensive classification expertise. In a computerized medical record environment, however, the provider-system interaction takes on relatively greater importance, especially where dedicated coding personnel are eliminated from the process. More than ever, healthcare organizations now rely on the accuracy of coded clinical data as the cornerstone of clinical quality, as well as a representation of financial viability. Thus, the need for training for clinicians has never been greater.

Where previous studies have suggested improvements for increasing coded data accuracy, recommendations have included the hiring of trained medical record professionals, the training of physicians, development of more detailed coding policies and procedures, the implementation of computer-based coding systems, and the reassessment of coding and classification systems. These recommendations, though logical in their foundation, have never been comprehensively evaluated for their actual impact on coding accuracy.

This study sought to examine instead one foundational issue, the level of documentation training that supports such broader issues. Coded healthcare data is used in research, strategic planning, facility accreditation, and mandated reporting requirements. Coding variation, therefore, has a far greater impact than simply reimbursement dollars.

Research is needed to evaluate the interaction of the physician-specific educational components inherent in coding practice, and identify sources of variance in the coding process. Such work should clarify how the coding process leads to coding errors, inequities in reimbursement, and how these components may influence DRG variance. A study that measures these components must be performed on a real-time basis, in a real-world environment. From a cost perspective, actual practice assessments or field studies are generally preferred. Given the impending advent of additional classification systems and computerized patient records, however, and the absence of any recent comprehensive studies in this area, such studies are likely to rely, in part, on the currency of documentation on the part of providers.

Assuming more documentation training is needed, how should such training be delivered? It seems likely that different levels of training will be needed, depending on the expected needs of providers. Small group or solo practitioners, for example, may be more involved in the process than a researcher at a large medical center.

Traditional documentation methods which employ detailed review of classification systems is time consuming, and likely to be rejected by busy providers. In contrast, given integration of proper documentation education in clinical practice, providers may be better served by a case-based approach. This would involve curriculum development and information transmittal that recognizes the need to develop problem-solving skills, as well as the necessity of helping providers acquire documentation knowledge and skills. Such a case-based approach would utilize real world problems, not hypothetical case studies with neat, convergent outcomes. It is within the process of struggling with actual problems that working professionals learn both content and critical thinking skills.

Such an ongoing training program can also be used to expose both coders and physicians to real-world problems and continuous group exposure to the types of ill-structured problems confronted by healthcare organizations on a day-to-day basis.

The incorporation of information sciences in general, and documentation and coding practices specifically, into the curriculum for undergraduate and graduate medical education may also be required to address information issues. In an evidence-based environment, where practicing providers likewise become part of the data creation process, it is critical that education initiatives be aimed at continuing education needs as well.

Deficiencies in education and training of health care professionals are important potential barriers to the optimal adoption of clinical advances and new technologies. There is a growing body of evidence that education and training in clinical informatics for medical students and in post-graduate medical education is inadequate. There is little information, however, on the current levels of education and training for other areas critical to modern medical practice, such as medical evidence interpretation and management. There is a related need to establish some training standards for the documentation and classification of patient data in healthcare organizations, as a baseline of information from which providers can begin to develop applications for managing the quality and accuracy of information.

While this study was designed to provide an initial benchmark for the next generation of healthcare providers, more refined education pathways for increasing knowledge need to be explored and debated. These requirements would be targeted not only at a retrospective outcomes evaluation level, but also at initial data-collection levels for community-based professionals, as those most likely to be involved in meeting the needs of the public. It is anticipated that current approaches to medical education will be challenged, not only in the priority assigned to the subject, but also in its delivery, particularly where medical educators teach clinical applications and management from an evidence-based perspective.

Limitations of the Study

As in any survey, there are dangers inherent to self-reported performance. In this study we attempted to accommodate the need for a study, which measures expert opinions, rather than traditional coder agreement. The resulting population is therefore self-selected, where the population surveyed is represented by those who respond to the questionnaire. Inherent to this process is the danger that results may not accurately represent the general population as a whole, or the healthcare industry in general. Inevitably, some respondents may provide inaccurate or false information. Results may be affected by form and structure of the questionnaire used, the topical area of questions asked, or the grouping and semantic construction of the questionnaire items. Survey questions limit their respondents to a short list of possible response choices, which may not include the respondent’s preferred answer. Ultimately, surveys, by their nature, provide perceptions rather than objective measures.

Conclusion

The U.S. healthcare industry stands at the threshold of a new era of clinical data management. The quality of healthcare data documentation healthcare data is more critical than ever. Adherence to approved coding principles that generate coded data of the highest quality remains important, but this is just a part of the overall data quality picture. The consistent and accurate documentation and classification of data is an essential factor in data quality. As this study suggests, there exists significant variation in physician training within this area, despite increasing requirements for standardization and uniformity, by both payers and regulatory bodies, suggesting a need greater coding education and training for physicians.

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