The Cost of Medical Dictation Transcription at an Academic Family Practice Center

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Background: Very little is known about the volume or cost of medical transcription in primary care. A study of the number of lines and cost of transcription at an academic family practice center was performed to establish the average number of lines and costs of transcription by level of service and type of provider (faculty physician, physician assistant, resident physician, and others).

Methods: Parallel 4-month sets of computerized billing records and computerized transcription summary logs (listing the patient name and identification, the dictator, the number of lines of dictation, and the date for each dictation) were merged and analyzed to compare the cost and volume of dictation by types of service and types of provider.

Results: During the study period there were 11 085 patient encounters, 9013 with transcription. The average cost of transcription per encounter using transcription was $3.96 and the median was $3.64. The cost per encounter ranged from $0.39 (3 lines of dictation) to $24.83 (191 lines of dictation). Faculty physicians and physician assistants had the lowest cost, resident physicians were intermediate in cost, and others (such as medical students) had the highest costs for medical transcription. Transcription costs rose with increasing level of service but became a smaller proportion of the collected fee, averaging only 5% for a level 5 encounter.

Conclusions: The cost of transcription as a part of overhead was higher than anticipated. Specific education regarding dictation form and content and ways to decrease these costs is appropriate.

Arch Fam Med. 1998;7:269-272

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DICTATION SYSTEMS have been advocated since the 1960s to improve the completeness and legibility of medical records.[1] There is little in the family practice literature on the value or cost of dictation. Risk management authorities have recommended transcription of emergency department records.[2,3] A prospective study of the introduction of transcription services in a community hospital emergency department demonstrated improved legibility and completeness and a modest increase in physician productivity (3.8%).[4] Steuven et al[5] reported increased billing charges of $17 per record attributed to more appropriate coding as a result of improved legibility. Klimt et al[6] describe implementation of a transcribed emergency record system with a cost of $1.03 per record. The average record length was 13 lines (no definition of a line was given). In-house transcription costs for health care institutions around the country range from $0.17 to $0.25 per 65-character line.[7] We are unaware of any published budgetary guidelines for transcription costs in ambulatory care centers. The purpose of this study was to determine the cost of transcription of ambulatory care visits in a family medicine center and how this cost varies by billing code and provider type.

MATERIALS AND METHODS

The Family Medicine Center is the practice and academic site for the University of Oklahoma Department of Family and Preventive Medicine, Oklahoma City. Clinical providers include faculty and resident family physicians and physician assistants. The Family Medicine Center is a training site for family practice residents and medical students. Also, residents in obstetrics are required to complete a 1-month rotation in the Family Medicine Center as part of their primary care training. During 1996 there were approximately 37 000 patient encounters.

The Family Medicine Center contracts with the Digital Transcription Service, Oklahoma City, to provide medical

Table 1. Cost of Medical Dictation Transcription at an Academic Family Practice Center for a 4-Month Study Period

	No. of Visits	No. of Dictations	Dictation Cost, $ Per Dictation Mean	Dictation Cost, $ Per Dictation Median	Dictation Cost, $ Per Encounter Mean
Faculty	3778	2566	3.73	3.38	2.53
Residents	6017	4869	4.06	3.64	3.39
Physician assistants	1274	1190	3.84	3.51	3.59
Others*	0	131	5.35	4.94	. . .
Unknown	16	14	5.08	4.81	. . .
Total	**11 085**	**8770**	. . .	. . .	. . .

**Transient providers; ie, medical students and obstetrical residents on primary care rotation. Ellipses indicate not applicable.*

Table 2. Mean Cost of Transcription by Level of Service for Routine Office Visits to an Academic Family Medicine Center*

	Faculty	Resident	PA	Others	Overall	*P*
New Patients						
Level 1	. . .	3.81	. . .	. . .	3.81	. . .
Level 2	3.22	4.21	3.20	6.56	3.88	<.001
Level 3	4.49	4.94	4.32	6.95	4.77	<.001
Level 4	6.37	6.33	7.63	8.09	6.46	.05
Level 5	8.14	5.86	. . .	. . .	7.13	.04
Established Patients						
Level 1	1.52	4.01	2.73	. . .	3.11	.06
Level 2	2.88	3.08	2.93	3.36	2.99	.22
Level 3	3.59	3.67	3.73	5.07	3.68	<.001
Level 4	4.40	5.29	5.75	6.48	4.98	<.001
Level 5	5.91	6.68	8.80	. . .	6.45	.04
Well-child visits	2.76	3.55	3.76	. . .	3.42	.001

**All data are given as US dollar amounts unless otherwise specified. PA indicates physician assistant; ellipses, not applicable.*

transcription at a cost of $0.13 per line, where a line is defined as 65 characters. Providers call into a local telephone number to dictate and the transcribed copy is delivered by modem, usually within 48 hours. A daily dictation summary log is prepared on the receiving computer, listing patient name and identifier, dictator, date of service, and the number of lines of dictation. These logs were collected to form the dictation data set.

All dictations by faculty physicians (n=16), resident physicians (n=52), physician assistants (n=4), and others (medical students or obstetrics residents, n=4) were included in the study. For 14 transcriptions the dictator could not be identified; these are likely transcriptions from transient providers, ie, medical students or obstetric residents on a 1-month rotation. One physician faculty member chooses not to use the telephone dictation system.

Computerized billing records from the billing system and summary logs from the transcription service were collected for the 4-month period from May 1, 1996, to August 31, 1996. The billing system records included the patient identifier, the rendering and supervising (if applicable) providers, the date of service, the procedure and disease codes, and the charges. These 2 data sources were merged using the patient identifiers and dates of service to form the final data set. Inpatient visits, nurse-only visits, and telephone encounters were deleted.

The final data set was analyzed using SAS Statistical Software, version 6.04 (SAS Institute Inc, Cary, NC). The Kruskal-Wallis nonparametric analysis of variance (ANOVA) test was used to compare cost of transcription among different provider types and levels of service. The Scheffé test was used to compare costs for pairwise comparisons of different types of providers.[8] Because of the number of comparisons, P=.005 was deemed to indicate statistical significance (Bonferroni correction).

RESULTS

There were 11 085 patient encounters and 9013 transcriptions for the study period. Omitted from the analyses were 243 transcriptions that could not be matched with a bill, leaving 8770 transcriptions for analysis. The 243 omitted transcriptions likely represent encounters for which the patient failed to return the encounter form, encounters for which no bill was submitted by the provider, or transcriptions that could not be shown to be telephone encounters.

There were 2315 invoices for which no dictation was found. These encounters represent those for which the provider handwrote the progress note, used a standard form such as for a prenatal or well-child visit, or failed to document the encounter. For these encounters a record review of a 10% systematic sample with a random start (233 records) showed that 23 visits actually had a transcribed record present, 117 had a handwritten note in place, 43 used a standard form, and 50 had no documentation in place. Of these 50, 7 had no recorded vital signs, forms, or any other documentation that a patient visit had occurred on that date, indicating a billing error for the date of visit. Seven additional records had a transcribed note within a day of the encounter in question, also suggesting an error in the billing date.

The average transcription cost per encounter was $3.96 and the median was $3.64. For all encounters (including encounters not dictated) the mean cost was $3.13. When the analysis was restricted to new and established patient visits (*Current Procedural Terminology* [CPT] codes 99201 to 99215 and W3011, eliminating encounters that had procedures as the primary billing code), the mean cost was $4. The range was from $0.39 (3 lines of dictation) to $24.83 (191 lines, billed as an established patient, level 3 encounter, usual reimbursement about $24).

The cost by provider type is presented in **Table 1**. The median cost of transcription ranged from $3.38 per transcription for faculty members to $4.94 for others (medical students and obstetrics residents). Calculated on a per encounter basis, the mean cost for faculty members was $2.53; this reduction is due in part to the lower proportion of faculty encounters that use transcription.

Table 2 presents the cost of transcription based on the level of service billed. In general, the cost of dictation increases with increasing level of service for all types of providers; means in the tables are reported only for

Table 3. Transcription Costs as a Percentage of Cost of an Office Visit, Assuming a 60% Collection Rate

	No. of Dictations	Charge, $	Usual Collection, $	Mean Dictation Charge, $	Dictation/ Collection, %
New Patients					
Level 1	3	54	32.40	3.81	11.8
Level 2	256	67	40.20	3.88	9.7
Level 3	546	87	52.20	4.77	9.1
Level 4	216	125	75.00	6.46	8.6
Level 5	34	169	101.40	7.13	7.0
Established Patients					
Level 1	14	28	16.80	3.11	18.5
Level 2	713	40	24.00	2.99	12.5
Level 3	4868	51	30.60	3.68	12.0
Level 4	1180	74	44.40	4.98	11.2
Level 5	116	119	71.40	6.45	9.0
Well-child visits	377	68.20	68.20	3.42	5.0

categories with more than 3 cases. (Level 1 visits are supposed to be "nurse-only," but some providers may use this code to give patients a price discount.) Comparison of the different types of providers for each level of service shows that faculty physicians tend to be the most concise. Medical students and other providers in the Family Medicine Center for a short time were the most verbose. These differences were statistically significant for most of the comparisons. Pairwise comparisons for the provider groups using the Scheffé test for the cost per transcription showed that temporary providers (medical students and obstetrics residents) were statistically more costly than the other groups; residents were statistically different from all other groups; faculty physicians and faculty physician assistants were not different from each other; and both were signficantly less costly than residents and students.

Transcription as a proportion of reimbursement is shown in **Table 3**. The figures assume a 60% collection rate for billed charges, a rate close to our actual experience for the past 2 years. Transcription as a percent of the collected fee ranges from more than 5% for well-child checks to more than 12% for less-intensive encounters.

We did not compare the cost of handwriting an encounter with the cost of dictation. A "back of an envelope" comparison can be postulated with the assumption that legibility and depth of information are equivalent (not likely in reality). We empirically estimate that the time to dictate is 2 minutes per encounter, that the time to handwrite is 4 minutes per encounter, and that a physician's time is worth $150 per hour. This comparison yields a cost per 10-encounter half-day session of $89.60 for dictation ($39.60 for 10 transcriptions and $50 for 20 minutes of physician time) and $100 for the 40 minutes of time for handwriting progress notes. The additional 20 minutes spent in handwriting notes could conceivably be spent on another patient encounter; unfortunately, patients and schedules are rarely that convenient. Given that these are rough assumptions, dictation seems cheaper, with enhanced legibility, and possibly more complete data capture. If one assumes that physician time is a fixed cost under a salary structure, the cost of physician time in documentation would be irrelevant and transcription would therefore be more costly, but would have advantages in terms of legibility. Further research would be necessary to confirm or refute these assumptions.

COMMENT

Cameron[9] estimates that the labor cost of transcription is about $0.09 per line, with total cost per line of $0.17 to $0.19 (1996 estimates). Our rate of $0.13 compares favorably. No published guidelines for appropriate length of dictation exist. Certainly the salient features of the encounter and details of the diagnostic and treatment plan should be recorded. The legal maxim "If it isn't documented, it wasn't done" may inflate some dictations. Inexperience also may lead to longer dictations; alternatively, extensive clinical experience may result in underdocumentation. Also, faculty physicians and physician assistants see a higher volume of patients and may, out of necessity, dictate briefer progress notes.

The cost of transcription was roughly 11% of the collected fee, higher than we had anticipated. Individually, each of the overhead costs of nursing staff, clerical staff, utilities, and building maintenance are likely to equal or exceed this cost. Traditionally, overhead in family practice has been about 55% of practice gross. Although the proper proportion of overhead costs for transcription is unknown, 10% seems high.

Alternatives to medical transcription are on the horizon. Voice recognition software systems with dictionaries for primary care are now available, with accuracy rates for free narrative by trained dictators approaching 94%.[10] Software costs vary according to hardware configurations and the number of users, but can be as low as $2300 for a single user on a personal computer with a 16-bit sound card. While the cost of the providers' time spent correcting dictation errors should be considered as part of the ongoing variable cost of dictation, the cost benefit could eventually be favorable when compared with transcription services.

The shortcomings of the current study include the use of a single center, which limits the generalizability of the findings. Another problem was the difficulty in matching the transcription summary with the billing record. We do not think this difficulty materially biased the results. This study does not address all costs of dictation, only the labor costs of transcription. Omitted were provider time, filing costs, and equipment and paper costs.

There are several potential areas of further study. The proper amount of dictation is unknown and the art of dictation is not formally taught. Family practice rotations in medical school may be a time to target instruction of proper dictation. Purvis et al[11] discussed proper coding for office care; proper dictation is another area suitable for educational intervention for residents. While the Residency Review Committee for Family Practice re-

quires accredited postgraduate training programs to use the structured medical record (subjective, objective, assessment, and plans or "SOAP") format for ambulatory care visits, there is no requirement for transcription of medical records. However, improvements in documentation are potentially associated with increased operation costs. Cost control decisions must be tempered by the potential negative effects on audits for appropriate billing practices and the information communicated to other providers.[12] Norms for levels of service and types of providers could be established, allowing for individual differences in practice. Our findings indicate a need for transcription instruction, perhaps along the billing guidelines of documentation for allowed billing by inclusion of essential and optional elements.

Accepted for publication September 19, 1997.

This research was supported by grant D32PE-10117 from the Bureau of Health Professions, Rockville, Md.

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