Case Report ■

Computer-based Speech Recognition as an Alternative to Medical Transcription

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Abstract The purpose of this report is to describe the author's experience using computerized dictation during routine outpatient medical practice. During a six-month period, patients seen by the author in the Pediatric Gastroenterology Clinic at the University of Virginia were assigned to human or computer-based transcription. Of 1,129 notes, 580 were completed by a transcriptionist and 549 by computer. The total time spent dictating and editing notes was approximately one minute more for computerized dictation than for a human transcriptionist (379.81 ± 132.69 sec vs. 326.14 ± 126.02 sec; $P < 0.0001$). Notes generated by computer were slightly longer than notes generated by a transcriptionist (52.42 ± 16.45 lines vs. 50.41 ± 16.73 lines; $P = 0.0422$). Of notes generated by a transcriptionist, 139 (24 percent) were completed within two days of the visit, whereas all notes generated by computer were completed on the day of the visit.

■ **J Am Med Inform Assoc.** 2001;8:101–102.

Computerized speech recognition may decrease the costs associated with creating transcribed documents and may lessen transcription delays.[1,2] Although previous attempts to use computerized dictation in medical practice have met with limited success,[2] tremendous advances have been made in computerized speech recognition during the past several years.[3–5]

METHODS

During a six-month period, patients seen by the author in the Pediatric Gastroenterology Clinic at the University of Virginia were assigned to human or computer-based transcription. For the first three months, dictations were performed by a human transcriptionist, and for the remaining three months, with voice-recognition software. Computer transcription was performed on a Dell laptop computer with a 500 MHz Pentium processor, 256 MB RAM, ESS Maestro sound card, and Andrea NC-61 microphone, using IBM ViaVoice Millennium software. Prior to using the computerized dictation system, the author completed a 50-minute training period to familiarize the computer with his speech patterns. For human transcription, all dictations were recorded on a hand-held recorder and transcribed by the same secretary. For both computer-based and human transcription, all text was dictated in its entirety; the author did not use any preformatted text or macros. All finished notes were formatted in an identical manner.

Using a stopwatch and log book, the author recorded the date of visit, type of visit (initial consultation or follow-up), date the dictation was performed, time spent dictating, time spent editing, date the note was completed, and length of the final note in 65-character lines. Data are summarized in Table 1. Comparisons between groups were performed with unpaired *t*-tests. Distribution of visit types was compared using the Fisher exact test. Differences were considered significant if the P value was less than 0.05.

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Received for publication: 5/25/00; accepted for publication: 7/25/00.

Table 1 ■

Comparison of Human and Computerized Dictation (Mean ± SD)

	Human Transcription	Computerized Transcription	*P* Value
No. of dictations	580	549	–
Initial consultations/ follow-up visits	213/367	213/337	0.4998
Dictation time per note (sec)	179.58 ± 61.42	203.09 ± 64.03	<0.0001
Editing time per note (sec)	146.56 ± 71.12	176.72 ± 78.41	<0.0001
Dictating + editing time per note (sec)	326.14 ± 126.02	379.81 ± 132.69	<0.0001
Length of final note (65-character lines)	50.41 ± 16.73	52.42 ± 16.45	0.0422
Number of notes - completed within 2 days of patient visit	139 (24%)	549 (100%)	<0.0001

RESULTS

There were 1,129 outpatient visits during the study period. Of these, 426 (38 percent) were initial consultations and 703 (63 percent) were follow-up visits. The distribution of visit types between the two groups was not significantly different ($P = 0.4998$).

The average time the author spent dictating a note for a human transcriptionist was significantly less than for computer transcription (179.58 ± 61.42 sec vs. 203.09 ± 64.03 sec; $P < 0.0001$). Similarly, the average time spent editing a note created by computer was significantly greater than with human transcription (176.72 ± 78.41 sec vs. 146.56 ± 71.12 sec; $P < 0.0001$). Therefore, the total time spent dictating and editing notes created by computer was significantly greater than for human transcription (379.81 ± 132.69 sec vs. 326.14 ± 126.02 sec; $P < 0.0001$).

Notes produced by human transcription were slightly shorter than notes produced by computer (50.41 ± 16.73 lines vs. 52.42 ± 16.45 lines; $P = 0.0422$). It took an average of 5.26 ± 3.48 days to complete notes produced by human transcription, and 139 (24 percent) of these notes were completed within 48 hours of the visit. In contrast, all 549 notes produced by the computer where completed on the day of the visit.

COMMENT

These data indicate that computerized speech recognition may be an acceptable alternative to human medical transcription for producing outpatient notes. The total time the author spent dictating and editing notes was approximately 54 sec, or 15 percent, more with the computerized dictation system than with human transcription. Compared with human transcription, the computerized dictation system was associated with a dramatic decrease (of more than five days) in the total time to complete notes. Computerized speech recognition technology is no longer just a promising technology but rather a clinically useful and economically viable tool.[3–5] Although it takes somewhat longer to dictate and edit outpatient notes on the computer, compared with dictating and editing them for human transcription,[1,4,5] with currently available hardware and software computerized dictation can dramatically decrease delays associated with transcription and may substantially decrease the cost of producing transcribed documents.

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