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Adapting a Computerized Medical Dictation System to Prepare Academic Papers in Radiology

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Everyday radiologists use dictation software to compose clinical reports of imaging findings. The dictation software is tailored for medical use and to the speech pattern of each radiologist. Over the past 10 years we have used dictation software to compose academic manuscripts, correspondence letters, and texts of educational exhibits. The advantages of using voice dictation is faster composition of manuscripts. However, use of such software requires preparation. The purpose of this article is to review the steps of adapting a clinical dictation software for dictating academic manuscripts and detail the advantages and limitations of this technique.

Description of the Problem

Although computerized speech recognition technology has been deployed widely within radiology departments throughout the United States,[1-6] its use is typically only limited to generating clinical reports. Speech recognition software in radiology offers immediate, real-time visualization of the transcribed words, rapid turn around times,[5,7] increased flexibility in the use of standardized templates, and reduced cost of labor for human transcription services.[5] Although usually there is a brief training and adaptation period, most users become facile with the technology within a short period. Increased adoption and familiarity of speech recognition software holds great potential for use beyond clinical reporting.

Institutional Approach to Address the Problem

Over the past 10 years, we have composed academic manuscripts, correspondence letters, and the text of education exhibits using speech recognition software available for clinical use within our department (including the first draft of this current manuscript using Commissure RadWhere powered by Dragon NaturallySpeaking (Nuance Communications Inc,Burlington, MA)). Approximately 20% of staff radiologist (20 radiologists) in our department use in-hospital speech recognition software for preparation of documents other than clinical reports. The advantages of using transcription software available within the department rather than other commercially available software include familiarity with the techniques of dictation and editing tools of the software, and extensive vetting of the software to the speech patterns of the individual radiologist.

Although the use of commercially available speech recognition technology has been described in the composition of scientific articles,[8] the steps, advantages, and limitations in adapting this technology for academic use in radiology has not been realized. Therefore, the aim of this article is to describe the steps in adapting available speech recognition software for dictating academic manuscripts in radiology and discuss the advantages and limitations of this method.

Steps to Adapt Transcription Software to Dictate Academic Material

Although the use of speech recognition software has accelerated the completion of these documents, proper predictation preparation is necessary to insure a complete and efficient outcome. Dictating a manuscript involves preparation, including:

(1) Organizing and understanding the study data and literature of the manuscript;
(2) Creating an outline;
(3) Dictating and continuously editing the manuscript using mouse, keyboard, and dictaphone;
(4) Transferring text to a word-processing software. Details of each step are outlined below.

1. Preview and Organize Available Study Data and Literature

First, collect and organize the study data and the relevant published literature. Continuous speech recognition software

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functions optimally if it is presented with a smooth and relatively uninterrupted stream of words. Because verbal dictation typically proceeds at a much faster pace than manual typing, knowledge of the relevant literature referenced in the manuscript, and complete knowledge of the data becomes more important to ensure a smooth transcription session.

2. Create an Outline (or Even a Dictation Template) Tailored to the Specific Manuscript Type and Journal Requirements

Previous authors have noted the importance of having a well-structured, detailed outline of the manuscript before starting the dictation process of scientific articles.[9] Image interpretation dictations are facile for radiologists because the thought processes for medical terminology have been organized through years of training, and enhanced through the availability of structured clinical dictation templates. Similar organization, with the creation of an outline including an abstract, introduction, body, materials and methods, results, discussion, and conclusion, can aid in the organization of an academic manuscript. A template tailored to the particular type of manuscript, exhibit, or specific journal may also be created and stored.

3. Open an Empty Template Within the Speech Recognition Software, Paste the Outline, and Dictate the Text of the Manuscript

Once the literature is reviewed, the study data collected and organized, and an outline created, dictation of the manuscript can begin. Standard commercially available speech recognition dictation software can be opened onto a blank template. The prepared outline discussed earlier can be pasted onto the blank template and dictation of the manuscript can start in sequential order using the outline as a guide (Fig 1).

4. Continuously Reviewing Real-Time Dictation and Editing Words and Phrases Using the Dictaphone, Mouse, and Keyboard

As the manuscript is being dictated, real-time visualization of the output on the screen allows for immediate review of the manuscript. Immediate correction of the manuscript can be made with a combination of the mouse, keyboard typing, and redictation using the dictaphone.

5. Use the Copy and Paste Function to Transfer Text From Speech Recognition Software to Word-Processing Software for Final Editing

Finally, after most of the text is dictated, the dictated text material can be transferred from the speech recognition software to a word-processing program using the copy & paste functions (Fig 2).

Outcomes

In the process of dictating manuscripts, letters, and educational exhibits, we have realized several advantages including the following:

1. Faster Composition of Manuscripts

An average typist can transcribe up to 38-40 words/min.[10] However, when mentally composing a manuscript while typing, the average individual is limited to approximately 19 words/min.[11] Speech recognition software has been reported to transcribe words (for English language) at an average speed of more than 160 words/min.[12] This faster speed may offer advantages in more rapid composition of the manuscript while allowing one to "think out loud" during the composition of the manuscript. This feature may help individuals

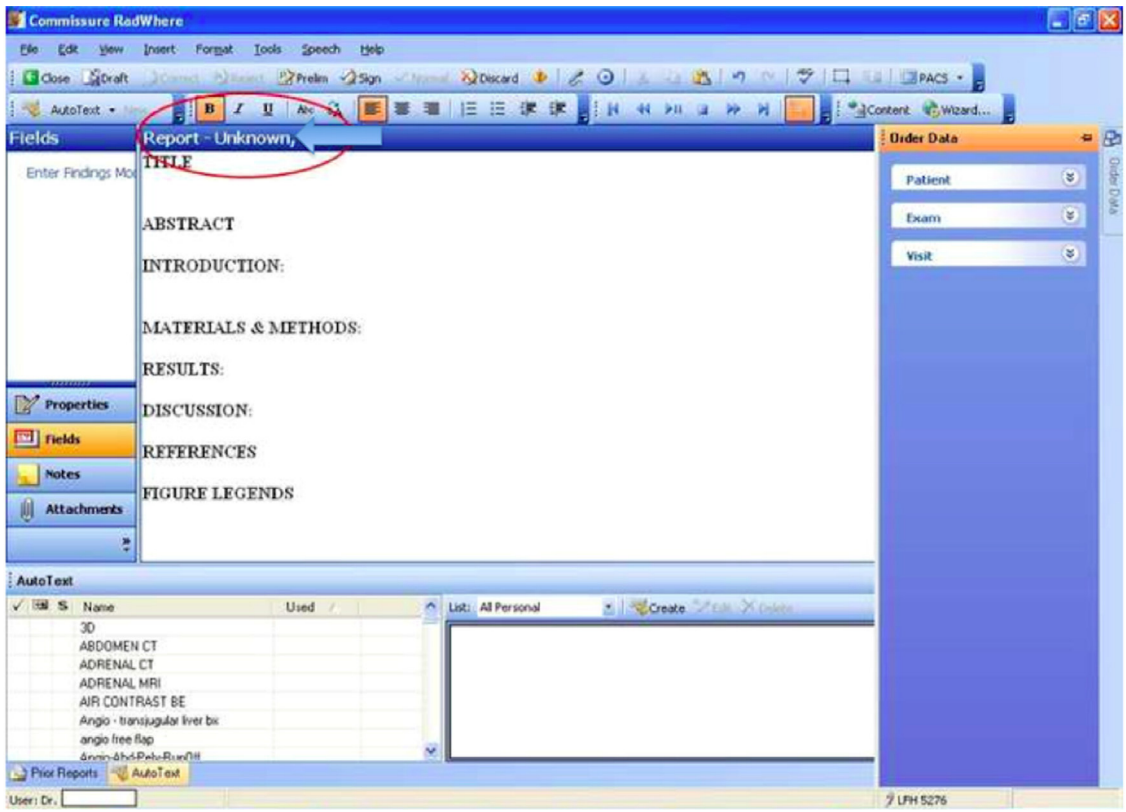

FIG 1. Screenshot showing the open temporary template (red oval) with a general manuscript preprepared outline pasted into the Commissure RadWhere. Templates for specific scientific journals can be created and named accordingly in the space provided by the voice recognition software (blue arrow). (Color version of figure is available online.)