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## Neurological speech recognition a no-brainer

By Adam Carey  
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### Medically literate voice recognition software is helping to heal hospital backlogs.

Australia's public hospitals are stretched to breaking point.

Nowhere is this truer than at Geelong Public Hospital's neuroscience department, where three full-time and four part-time consultants see about 8000 patients a year.

Each visit generates a post-consultation letter, completed and filed within 48 hours, according to government best practice standards.

Speech recognition software was seen as a solution to the low-tech, labour-intensive grind of a doctor dictating a letter, passing it to a medical secretary for transcription, and then proofing it again before postage.

"Letters in our specialty usually run to one or two pages and the (secretaries) perhaps type three to four letters in an hour," says Associate Professor Peter Gates, head of the neuroscience department.

Professor Gates says the department often struggled to meet best practices as a backlog of letters built up. Hiring another secretary was out of the question, so speech recognition software, with a neurological vocabulary, was installed.

Dragon NaturallySpeaking Professional, loaded with NeuroSpeak dictionary, quadrupled the speed of letter transcription.

Professor Gates says the medical secretaries now complete 12 to 15 letters an hour. "All they do is proofread instead of typing and correcting them."

The software is a stand-alone application that sits on top of Windows XP and 2000 applications. It is incompatible with other operating systems. Dictated letters are saved as both text and voice files on the server and a roaming feature means files are accessible to any desktop.

The software has about 320,000 English words in its dictionary, which can be continually updated.

It learns accents, including the Australian "Strine", by breaking words into phonemes, then analysing the sounds according to algorithmic templates.

"We've actually gone out and kidnapped Australians and put them in a cupboard and got them to talk," says Derek Austin, Australian sales manager for Nuance Communications, which markets the software.

Mr Austin admits the software's ability to understand accents is not infallible and that it might not work for people with very thick or unusual accents. Users train the software to recognise their speech patterns and create a personal voice profile.



Professor Peter Gates said speech software quadrupled output.

Photo: Gary Medicott

Voice is recorded by speaking directly into a PC via a noise-cancelling headset with two microphones - one of which cancels background noise. Professor Gates says he initially spent three hours reciting simple phrases to train the software to recognise his voice. But with the upgrade to Version 8, it took him less than 20 minutes.

Mr Austin says the company is improving the software so it can be ready to use the moment it is taken out of the box.

"The holy grail here is to have speaker independence for continuous speech recognition, so Dragon wouldn't need any training at all to get the system up and running," he says.

NeuroSpeak improves the accuracy of recognising and spelling neurological terms and phrases. There is no need to spend time training the software to understand specific terms.

Product development manager for Voice Perfect Systems, Wayne Doyle, says the key is not necessarily an extensive dictionary of neurological terms but an understanding of the terms and phrases neurologists use.

"We don't tend to focus heavily on having unique words but more on the language model of report writing and neurology reports in this case," he says.

Professor Gates estimates the software is about 95 per cent accurate in its translation of his speech into text.

And he says the accuracy level is improving: each time he makes a correction, the word is entered in the dictionary.

But despite translating complex terms and phrases, Professor Gates says the software sometimes struggles with simple conjunctive words.

"It has a problem with the ands and the ifs and the buts every now and then."

## **NEXT LESSONS**

**PROBLEM:** Administrative staff in the neuroscience department of Geelong Public Hospital struggled to clear a backlog of post-consultation letters.

**PROCESS:** Dragon NaturallySpeaking Professional speech recognition software was installed with a specialist capability to understand neurological terms. Productivity lifted four-fold.

**POSSIBILITIES:** The speech recognition software runs on a central server, consultants have more time with patients. No extra staff hired.

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