Dental Informatics Online Community
Webcast

Speech Recognition in Dental Software Systems

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Background

- speech recognition is one of the most desired improvements for clinical computer applications
- keyboard and mouse are ineffective for dentists
- 13% of all general dentists w/ computers at chairside use speech recognition for data entry
- 16% have tried and discontinued using speech

Speech in Dental Software

- four PMS that make up 80% of the market
- full working copies of each
  - reviewed user manuals
  - explored programs
  - ask vendors questions
- created a feature/function checklist

Features and Functions

	Systems			
	One	**Two**	**Three**	**Four**
speech engine	Microsoft	Microsoft	Default (SAPI 4.0/5.0)	Default (SAPI 4.0/5.0)
free txt dictation	Yes	No	No	No
documented training time	5-10 mins	5-10 mins	5-10 mins	5-10 mins
extra training	Yes	Yes (dental terms)	Yes (dental terms)	Yes
number of specific commands	~ 573	~ 140	~ 41	~ 53
hard tissue charting	Yes	Some	No	No
periodontal charting	Yes	Yes	Yes	Some

Entering Patient Data

- simulated patient data containing 18 hard and soft tissue findings
- step-by-step script was created for each program
  - contained specific commands in correct order
- Vendors reviewed each script

Excerpt From Two Scripts

Recommend a B composite veneer on tooth 8

System One	**System Two**
"select 8"	"tooth 8"
"procedures"	"quick pick menu 11"
"move down 4"	"menu item 4"
"next"	"proposed"
"bottom"	"OK"
"move up 4"	
"OK"	
"recommended"	

Charting Patients via Speech

	Systems			
	One	**Two**	**Three**	**Four**
total number of commands in script	87	72	19	30
total number of voice commands in script	69 (H) 18 (P)	41 (H) 25 (P)	2 (H) 14 (P)	0 (H) 19 (P)
total number of mouse/keyboard commands in script	0 (H) 0 (P)	6 (H) 0 (P)	3 (H) 0 (P)	4 (H) 7 (P)
percent completed with voice alone	100	92	84	63

(H) – Hard Tissue Charting, (P) – Periodontal Charting

Conclusions

- current PMS Speech interfaces are cumbersome
- they require knowing many specific commands
- interacting is just like using the mouse but with your voice

Creating a Better Speech Recognition Interface

- testing systems with actual users
- submitted a grant to develop a natural language system that should match spoken words to concepts
- clinicians will be able to speak to the computer naturally

Thank You!

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