The GuideView System for Interactive, Structured, Multi-modal Delivery of Clinical Guidelines

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Main Features of GuideView

- Complex guidelines are broken into simple steps in a process flow
- Instructions for each step are presented in multiple modes
- Text, voice and sound, pictures
- Full-motion video
- Live action (with annotations)
- Animation
- GuideView interacts with the user in two modes
- Mouse clicks
- Voice Navigation: both hands can be free to assist the patient

GuideView Design Goals

- Reduce Complexity
  - Each process steps is a simple task that can be completed even by those with minimal medical training
- Decrease Cognitive Load
  - At each step only a small (5 maximum) choices to next step
- Support backtracking
  - No choice is final. Can always return easily to a previous step and follow different path
- Enable repetition
  - Provides instructions for any step as often as desired
- Support modularity and re-usability of guidelines
  - Guidelines can be developed in small modules
  - Modules can be chained and nested as needed to create complete protocols
- Reinforce learning by providing multiple instructional modes
  - Each step is presented using multiple media, text, visual and visual aids

GuideView supports mobility

- User interface identical to the desktop version
- Full-motion video and voice output available
- Online and mobile platform with consistent look and feel
- Over the web on Windows and Macintosh clients running Internet Explorer
- Stand-alone on Windows computers
- On Windows Mobile PDAs (Pocket PCs)

GuideView supports two modes of interaction

- User interaction is facilitated through the following:
  - Standard menu navigation through mouse clicks
  - Voice navigation is being developed
- Text instructions

GuideView User Interface

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GuideView Author

- Used to develop clinical guidelines and save them in a form capable of being played back using GuideView
- Up to 5 branch points at each node
- Fast and zoom functions for navigating across complex, lengthy protocols
- Supports insertion of text, voice, pictures and video
- Content saved as XML
- Cross-platform capability
- Can create GuideView-compatible protocols over the web
- A graphical editor for creating, editing, and updating GuideView process flows

Results of Usability Study

- Audio instructions rated useful to indispensable by 100% of subjects
- Video also rated highly
- Task load index significantly higher (p < 0.02) with voice recognition than without
- Reason: Microphone and recognition software were oversensitive and interpreted external noises as commands

Future Work

- Interface GuideView with electronic health record systems
- Improve voice navigation
- Add an export mode for use by physicians
- Develop extensive modular library with management and search features
- Enable connectivity with medical devices and sensors
- Explore engineering applications for GuideView technology

Two GuideView Procedures

Ophthalmic: Evaluation of redeye includes diagnosis and treatment of eye irritation:
- Instructions for performing eye exam
- Detection and removal of foreign body in eye
- Detection and treatment of abrasions in eyes
- Diagnosis and treatment of bacterial and viral conjunctivitis
- Foreign body in the eye is the most common medical problem in space travel.
- (Clark, MD, personal communication)
- Airway stage: Diagnosis and treatment of acute breathing problems
- Heimlich maneuver
- Insertion of ILMA (Intubating Laryngeal Mask Airway)
- Countermeasures
- Assisted breathing using Ambu bag
- Others

Usability Study

- A usability study1 was performed at the Human Patient Simulation Laboratory, WYLE Life Sciences, Houston, TX.
- Ten subjects used GuideView on a laptop to perform two procedures: Heimlich maneuver and insertion of ILMA
- A usability questionnaire and the NASA Task Load Index2 were administered immediately after completion

References


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Acknowledgments

- The authors thank Kathy Johnson-Thai, PhD; Jack W Smith, Jr, MD, PhD; John Hines and Glenn Holt for support, advice, and encouragement.
- Very special thanks to Tyler Carruth, WYLE Life Sciences, Houston, TX, for generating medical and multi-modal content used extensively in the redeye protocol