Computer Simulated Standardized Patients for Training Health Professionals
On Chemical and Biological Agent Exposures

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Research Overview

• **Product:** PC-based, prototype training system
• **Key Element:** Simulation technology
• **Topic:** Bioterrorism recognition & management
• **Skills:** Social interaction with patients
• **Training approach:** Experiential learning
• **Interface:** Conversation with Virtual Standardized Patient [VSP]
Current training methods

- Performing medical procedures
  *Simulations, mannequins, “see one, do one, teach one”*

- Learning new information
  *Textbooks, lectures, e-learning*

- Developing interactive, social skills
  *Role plays, including: MASCAL enactments & Standardized Patients (SPs)*

Limitations of Role Play training

- Variable amount & type of feedback
- Low knowledge retention
- Little opportunity for continued practice
- Restricted availability to students
- High cost per person
- High level of coordination and resources
Training Health Professionals

- How can we satisfy the need to train social and conversational skills to health professionals?

- Can simulation technology and e-learning be used to train these skills using an experiential training strategy?

Solution: Develop & Test a prototype

- Planned a training module prototype

- Created a Virtual Standardized Patient

- Implemented simulation technology

- Paired simulation with e-learning material

- Gathered feedback from physicians
Teaching objectives & Skill set

- Taking a medical history
- Responding to an ill patient
- Delivering a difficult diagnosis

Simulation Technology Overview

- Character Versions
- Emotional Model
- Actors & Video
- Constant Feedback
- Unique Logic
- Voice Recognition
- Unique Conversations
Survey results
15 military physicians

• Interest & Repeat Use
• Comparison to Standardized Patients
• Topic & Content
• Training & Function
• Usability

Interest & Repeat Use

• 87% agreed that the simulation was entertaining
• 87% agreed that they were curious to run the simulation again
Comparison to Standardized Patients

- 56% indicated that the experience compared favorably to interacting with a live SP [Of the 9 participants that had experience with SPs]

- Realism of interaction with the Virtual Standardized Patient:
  - 47% rated as Good
  - 47% rated as Very Good
  - 7% rated as Excellent

Topic & Content

- 87% assessed the set of medical conditions as appropriate

- 13% assessed the set of medical conditions as being appropriate ONLY for skin manifestations
Training & Function

- *Would you use this in medical curriculum?*
  
  66%: Yes

- *How should this simulation be implemented as a training tool?*
  
  Supplement: 85% chose as BEST FIT
  Refresher training: 67% chose as 2nd BEST FIT
  Stand-alone product: 58% chose as WORST FIT

What’s Next?

- Launch prototype into full training system
- Conduct research study to test efficacy
- Develop additional medical simulations
- Introduce technology to other disciplines
What’s Next?: Develop full system

• Modify simulation elements:
  * Enrich e-learning content
  * Expand selection of discussion topics
  * Include multi-media medical exam features
  * Increase variety of character responses for richness
  * Add Marburg hemorrhagic fever character version

What’s Next?: Research study

• Purpose: Test efficacy of repeated practice of simulation

• Sample size: 60 health care professionals

• Research Design:
  - 60 use e-learning component
  - 30 use simulation [randomized]
  - 60 will perform 2 interviews with live SPs
  - 60 will receive double-blind assessments

• Statistical method: Student’s two-tailed t-tests, chi square
**What’s Next?: Other applications**

- **Medical simulations:**
  *Risk Assessment & Diagnosis: PTSD*
  *Diagnosis & Mgmt: CBRNE/Pulmonary Syndromes*

- **Simulations for non-medical disciplines:**
  *Functional Skills Training: Children with Autism/ASD*
  *Motivational Interviewing: Substance Abuse*

**Summary & Outlook for future**

- Conducted initial R&D as proof-of-concept
- Gathered feedback for second iteration
- Proved that interest in simulation function and interface exist among physicians
- Pursue future R&D efforts in diagnosis & patient mgmt.
- Continue R&D efforts and expand topic areas
Questions?

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