Gaming as a Tool To Teach Patient Safety

Simulation Game Team, A.T. Still University
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Audience Response
Game Shows for Patient Safety

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Learning Objectives

• Illustrate the application of Bravo games in medical education, specifically addressing patient safety

• Provide practice with the WHO Patient Safety Competencies (Systems, Adverse events, Infection control, Medication safety, Communication) using an interactive electronic game
Games in Medical Education

- How do games differ from other educational strategies?
  - competitive nature
  - rules and procedures
  - rewards
Benefits of Games in Medical Education

• integration of fun, excitement in learning process can reduce stress, anxiety
• motivation through competition
• social interaction, enhancement of communication, teamwork
• complement, reinforce existing knowledge
• provide feedback
“enjoyable”
“stimulating”
“engaging”
“increased my content knowledge”
“helped me retain information”
Mobile App Games for Patient Safety

Frederic Schwartz, D.O. Stanley Brysacz, DO
Lise McCoy, MTESL
3-5-Minute Cases for Mobile Learning

- iPhone
- iPad
- Android
- Tablet
The Prognosis Game App

- Decision making
- Investigation
- Management
- Instant feedback
- Case Discussion
- Skills Tracking

Ruptured left tympanic membrane
Purulent otorrhea
Tenderness to percussion of left postauricular area

BP 100/60 mmHg
PR 120 bpm
RR 18 per min
Temp 103 F
### Investigations

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Your Choice</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrodiagnostic studies</td>
<td>No</td>
<td>✗</td>
</tr>
<tr>
<td>VGCC &amp; Ach antibodies</td>
<td>No</td>
<td>✗</td>
</tr>
<tr>
<td>MRI brain &amp; spine</td>
<td>Yes</td>
<td>✔</td>
</tr>
<tr>
<td>CT Chest</td>
<td>No</td>
<td>✗</td>
</tr>
</tbody>
</table>

### Management

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Your Choice</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,4-DAP</td>
<td>Yes</td>
<td>✔</td>
</tr>
<tr>
<td>Steroids</td>
<td>No</td>
<td>✔</td>
</tr>
<tr>
<td>Chemotherapy</td>
<td>Yes</td>
<td>✗</td>
</tr>
<tr>
<td>Neostigmine</td>
<td>No</td>
<td>✔</td>
</tr>
</tbody>
</table>
The child stops complaining of ear pain after 3 days of medication. The mother decides to stop the antibiotics thinking that it’s unnecessary to continue.

Use patient stories to highlight errors and dilemmas.

The examination reveals a temperature of 103 F, a ruptured left tympanic membrane with purulent ear discharge, tenderness to percussion of the left postauricular area.

Practice decision making for diagnosis.
“Make game vignettes available for optional individual practice, or prescribe specific games as assignments for core rotations.”
Virtual Patient Simulations for Medical Education

In Fall 2012 beta trials, students surveyed found these to be engaging and valuable.

Tom Bennett, DO, Noel Carrasco, MD
Pedagogical Theory

- Cognitive Learning
  - Schema theory
  - Novice to Expert
- Constructivism
- Situated Learning
- Educational Game Theory

Diagram:
- Patricia's History
- The Neurology Consultant
- The Case Utilization Manager
- Challenges Your Order
- We Need to know if it's Dizziness or True Vertigo
- Why the dizziness Scheme?
- NO SCHEME NEEDED...?
- Pick The Scheme Do You Want To Use
- Patricia Faturia
Medical students need to rehearse clinical encounters before diagnosing real patients. This is urgent for the reason of patient safety.

Ziv et al., 2006
Key Takeaways

• Learning about patient safety can be fun, exciting, and interactive.

• Games provide deliberate practice to reinforce concepts students need to know.

• Games can be used to teach or test competencies.
Game Platforms

• C-3 Softworks (Bravo)  
  www.c3softworks.com

• Decision Simulation  
  http://decisionsimulation.com/

• Medical Joyworks  
  medicaljoyworks.com
Citations

• Teaching Physicians to Provide Safe Patient Care, Lucian Leape Institute Roundtable on Reforming Medical Education, National Patient Safety Foundation, 2010
• http://www.cdc.gov
• http://www.uptodate.com
• Medical Education, 2009, 43:303–311
• Medical Teacher, 2011, 33:156-160
• BMC Medical Education, 2010, 10:26
• Archives of internal medicine, 2010, 171:1385–90
• Simulation in healthcare, 2006, 1:252–6
Pedagogy and Educational Games

Lise McCoy, MTESL
School of Osteopathic Medicine in Arizona
A New Generation of Learners

“...a visually rich, multichannel form of expression can be powerfully compelling, engaging, and communicative” – Larry Johnson
Serious Games & VPS Support the Modern Learning Paradigm

1. Learning to Think
2. Performance-based
3. Inductive-emergent
4. Multiple Modalities
5. Customizable
6. Ecological
7. Collaborative

New Paradigm; Gee: Pullias Lecture, USC 2011 http://www.youtube.com/watch?v=FmcgMK46nfg
Physiological/Social Impact of Games

- Interactivity increases brain activity and neural nets.
- Engagement may be operationalized and measured as “flow”
- Game environments promote unconscious learning, a psycho social moratorium.
- Students must cooperate to solve real world tasks
Games Support 21\textsuperscript{st} Century Adult Learning Strategies

- Schema
- Scaffolds
- Feedback
- Theoretical connections
- Discovery
- Self-Direction
- Reflection
Which Pedagogical Theories Support Simulation/Game Learning?

**Cognitive Science**
- Schema Theory
- Cognitive Load Theory
- Skills Training
- Scaffolding
- Novice to Expert
- Thinking and Reasoning
- Knowledge Bundling

**Constructivism**
- Situated Learning
- Conceptual Frameworks
- Social Learning
- Case Based Practice
Learning Rewards: Games / Simulations

- Rich environments
- Legitimate peripheral participation
- Alignments of perspectival framing
- Shared virtual experiences
- Learning affordances
- Deliberate (anytime) practice
- Non-linear learning
Education References

Education References-Continued