Incorporating Simulation into Medical Education and Assessment

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Learning OBJECTIVES

At the conclusion of this session, you should be able to:

• Describe simulation-based education / assessment
• List opportunities that can be implemented with simulation based education / assessment
• Identify barriers associated with the implementation of simulation based education / assessment programs
What is “simulation”…..
Really…..
“Simulation” & Medicine
Simulation: Definition?

- *simulation*

1. Imitation or enactment, as of something anticipated or in testing.
2. The act or process of pretending; feigning.
3. An assumption or imitation of a particular appearance or form; counterfeit; sham.
4. *Psychiatry.* a conscious attempt to feign some mental or physical disorder to escape punishment or to gain a desired objective.
5. The representation of the behavior or characteristics of one system through the use of another system, esp. a computer program designed for the purpose.
Overview of WISER
WISER Mission

- Create a **safer environment for patients** by using simulation and other state of the art educational technology in the training and assessment of the healthcare system professionals

- Serve as a **laboratory to research the use of simulation** and other advanced instructional technology in healthcare education and to publish the results

- Create **simulation based education** programs for primary education in various domains of the healthcare delivery system

- Develop and validate **simulation based technology** as a competency assessment evaluation tool for healthcare professionals

- Contribute to the **education and mentorship of future generations of healthcare system educators** and education researchers interested in creating or evaluating simulation based teaching methodologies
Univ. of Pitt. Human Simulation Center
--“Circa 1994”
Physical Plant

12,000 square feet, 16 training rooms, 23 simulators, many part task trainers
Demographics of Participants

• Medicine
  – Medical Students (MS 2-4)
  – Residents
    • Anesthesiology
    • Emergency Medicine
    • ENT
    • Internal Medicine
    • OB/GYN (course work in development)
    • Pediatrics
    • Surgery
  – Fellows
    • Critical Care
    • Pediatric Intensivists
  – Faculty Members and Community Physicians
    • Anesthesiology
    • Critical Care Medicine
    • Emergency Medicine

• Nursing
  – Undergraduate Nursing Students
  – Practicing Nurses
    • Med / Surg
    • ICU
    • OR
  – Nurse Anesthetists
  – Student Nurse Anesthetists

• Pharmacy Students
• Paramedics, EMTs
• Respiratory Therapists
• Other Simulation Centers / Educators
• Many Others

11,000 simulation encounters last year
3,000 unique individuals
Who Does WISER Support?

• 75 Learning Systems (Courses)
• 55 Course Directors
• 228 Facilitators
• University of Pittsburgh
• UPMC
The Job of Healthcare Educators

Psychomotor Skills

Base Knowledge

Communications Skills

Decision Making

Teamwork Skills

Professionalism Skills
What’s the Goal?

Expert Curriculum
Which Tool?
The Tool Box

- Simulation
- PowerPoint
- Lectures
- Textbooks
- Case Study
- Syllabus
- Chalk Board
- On Line Learning

EXPERT Curriculum

Simulation
Why Simulation?

Pyramid of Learning and Retention:

- Lecture: 5%
- Reading: 10%
- Audio Visual: 20%
- Demonstration: 30%
- Discussion Group: 50%
- Practice By Doing: 75%
- Teach Others: 90%
Why Simulation?

TESTING

Teach
Psychomotor Skills
Decision Making
Skills and Decisions

Assess

Individuals ↔ Teams

Teach

End Goal
Why Now?

• Residents Get to Sleep
• Residents Get to Go Home
• Residents have to have Mints on the Pillows
• Etc etc etc

20 hours per week x 50 weeks X 5 Years = 5,000 less hours of training
Why Not Simulation?

- Not Very Easy
- Not Very Efficient
- Must Plan Ahead
- Difficult to Develop
- Status Quo is Easier
What does WISER do?

- Lower the Barriers for Successful
  - Creation
  - Implementation
  - Sustainment
Simulation Based Education Systems

Teaching Tools

Assessment Tools

Curriculum

Outcomes & Impact

Feedback

Research

SIMS

Internet-based Trainee Performance Feedback (including videos)
What do you think of first?
Basic Components of Successful Simulation Program

Student Curriculum

Administrative Scheduling

Instructor Curriculum & Support

Student Feedback

Simulator

Feedback to Instructor

Data Storage & Analysis

EXPERT IMPORT
WISER: the Enabler

Subject Matter Experts

WISER

Instructors

Students
Goal: Successful Programs

Support

Simulation Help (The tool Box)

Rules

Domain 1
Domain 2
Domain 3
Domain 4

Successful Program 1
Successful Program 2
Successful Program 3
Successful Program 4

Support
Evaluation
Evaluation

• Individual Trainee Evaluation
  – Per episode performance
  – Per class performance (group of episodes)
Evaluation

- Group Performance
  - Validate Scenarios
  - Validate Curriculum Deployment
Evaluation

- Individual Instructor Evaluation
  - Feedback from Trainee
  - Performance by Trainees
    - By Scenario
    - By Class
Evaluation

- Group Instructor Evaluation
  - Assess Curriculum Deployment
  - Reliability of Scenarios
  - Interrater Reliability
Data Examples

• Evaluations
  • Pre Course
Data Examples

• Evaluations
  • Post Course
Data Examples

• Evaluations
  • Feedback on Instructors
Select WISER Programs
Difficult Airway Management

- Anesthesiology
- Emergency Physicians
Central Venous Cannulation

Substantial reduction of Related Infections
Procedural Sedation for Pediatric Emergencies

• Required Course
• Pre-Course Content
• Pre-Test
• Multiple Scenarios
Health System Integration
Crisis Team Training
Improvement is rapid and measurable
Simulator “Mortality”
Discussion

www.wiser.pitt.edu