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
- **Pharmacy Students**
- **Nursing**
  - Undergraduate Nursing Students
  - Practicing Nurses
    - Med / Surg
    - ICU
    - OR
  - Nurse Anesthetists
  - Student Nurse Anesthetists
- **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
  - Case Study
  - Textbooks
  - Syllabus
  - On Line Learning
  - Chalk Board

EXPERT Curriculum

Simulation

PowerPoint

Lectures

Case Study

Textbooks

Syllabus

On Line Learning

Chalk Board
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

TEACHING

Psychomotor Skills
Decision Making
Skills and Decisions
Individuals ↔ Teams

Teach
Assess
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

SIMS

Curriculum

Outcomes & Impact

Feedback

Research

Internet-based Trainee Performance Feedback (including videos)
What do you think of first?

Expert Curriculum
Basic Components of Successful Simulation Program

- Student Curriculum
- Administrative Scheduling
- Instructor Curriculum & Support
- Simulator
- Data Storage & Analysis
- Student Feedback
- Feedback to Instructor

EXPORT
IMPORT
WISER: the Enabler

Subject Matter Experts

Instructors

WISER

Students
Goal: Successful Programs

Support

Simulation Help
(The tool Box)

Domain 1
Domain 2
Domain 3
Domain 4

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

Rules
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

Position Task Completion

Completion Percentage

Session

- Airway
- Airway Assistant
- Chest compressions
- Floor RN
- ICU RN (Cart)
- Procedure MD
- Recorder ICURN
- Team Leader
Simulator “Mortality”
Discussion

www.wiser.pitt.edu