Disclosure

• No conflicts of interest to report
Incorporating Simulation Into Your Training Program: Curricular & Practical Considerations

2015 ACGME Educational Conference, San Diego, CA
SES014

Shawn T. Beaman, MD
Associate Professor of Anesthesiology
Associate Residency Program Director
University of Pittsburgh School of Medicine
Director, Trauma Anesthesiology
UPMC Presbyterian Hospital
Pittsburgh, PA

Andrew W. Murray, MBChB, FASE
Assistant Professor of Anesthesiology
University of Pittsburgh School of Medicine
Director, Perioperative Transesophageal Echocardiography
UPMC Presbyterian Hospital
Pittsburgh, PA
Objectives

• As a large group briefly review:
  – Definition of simulation
  – Advantages of simulation in residency training
  – Characteristics of quality simulation
  – Barriers to implementing simulation
Objectives

• In small groups:
  – Devise simulation curriculum & plan for your program
  – Incorporate characteristics of quality simulation

• Reconvene & discuss
Definition of Simulation

• “Simulation is the imitation or representation of one act or system by another.”

• “Healthcare simulation
  – Education
  – Assessment
  – Research
  – System integration to facilitate safety”
Advantages of Simulation Education

• Training is no longer a haphazard apprenticeship
  – Learning experiences can be scheduled
  – Ensures all trainees participate
  – Rare topics can be simulated
Makes the Rare Common

• Difficult intubation
  – Ultimately successful – 1 / 100
  – Difficult vent AND difficult intubation – 1 / 250
  – Failed intubation – 1 / 2,000

• MH – 1 / 100,000

• OR fire – 1/560,000

• Perioperative death – 1 / 5,000
Makes the Rare Common

• 1,000 – 1,500 cases over 36 month residency
It Makes the Rare Common
Advantages of Simulation Education

• **Freedom for mistakes**
  – Learners free to see consequences of mistakes
  – Rate of patient injury is 0.0%

Society for Simulation in Healthcare www.SSH.org
It is Fun for Trainees
It is Fun for Teachers
Advantages of Simulation Education

• Learning can be customized to experience
  – Experiences can be tailored to the learner’s level of experience
Advantages of Simulation Education

• Feedback & evaluation
  – Can be delivered immediately
  – Learning experience can be interrupted
  – Performance can be reviewed on video
Quality Simulation

Quality Simulation

• 20 year meta-analysis 1990-2010
• Compare effectiveness of simulation-based medical education with “deliberate practice” to traditional medical education

Quality Simulation

- Deliberate practice
  1. Highly motivated learners, good concentration
  2. Well-defined objectives
  3. Appropriate level of difficulty
  4. Focused, repetitive practice
  5. Rigorous, reliable measurements
  6. Informative feedback
  7. Monitoring, error correction, more DP
  8. Minimal outcomes established
  9. Advancement to next task

Quality Simulation

- 12 search terms
- 3,742 articles reviewed
- 14 met inclusion criteria
- 633 learners participated in studies
- Mostly residents, mostly Medicine

Quality Simulation

- Skills examined in the studies included:
  - ACLS
  - Laparoscopic skills
  - Central line insertion
  - Cardiac auscultation
  - Thoracentesis

Quality Simulation

• Results showed large effect size (0.71 overall effect size correlation)
• “Simulation-based education with deliberate practice is superior to traditional medical education in specific clinical skill acquisition.”

Barriers to Simulation

- Deliberate practice
  1. Highly motivated learners, good concentration
  2. Well-defined objectives
  3. Appropriate level of difficulty
  4. Focused, repetitive practice
  5. Rigorous, reliable measurements
  6. Informative feedback
  7. Monitoring, error correction, more DP
  8. Minimal outcomes established
  9. Advancement to next task

Barriers to Simulation

- Most adult high-fidelity simulators cost $50,000-$100,000.
- One “ultra high-fidelity” simulator starts at $250,000.
- Partial-task trainers range from $2,500 to $10,000.
- Not inclusive of warranty or service contracts.
- Simulation center costs for large centers can be close to $1 M.