Simulation-Based Education (SBE)

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Objectives

- Describe Simulation-based Education (SBE)
- Compare different simulation modalities and understand its Pros/Cons
- Identify opportunities to implement SBE programs
- Understand how to develop SBE program (Step Approach)
- Identify challenges associated with implementation of SBE programs

SBE
SBME
Simulation In Medical Education

What is Simulation?

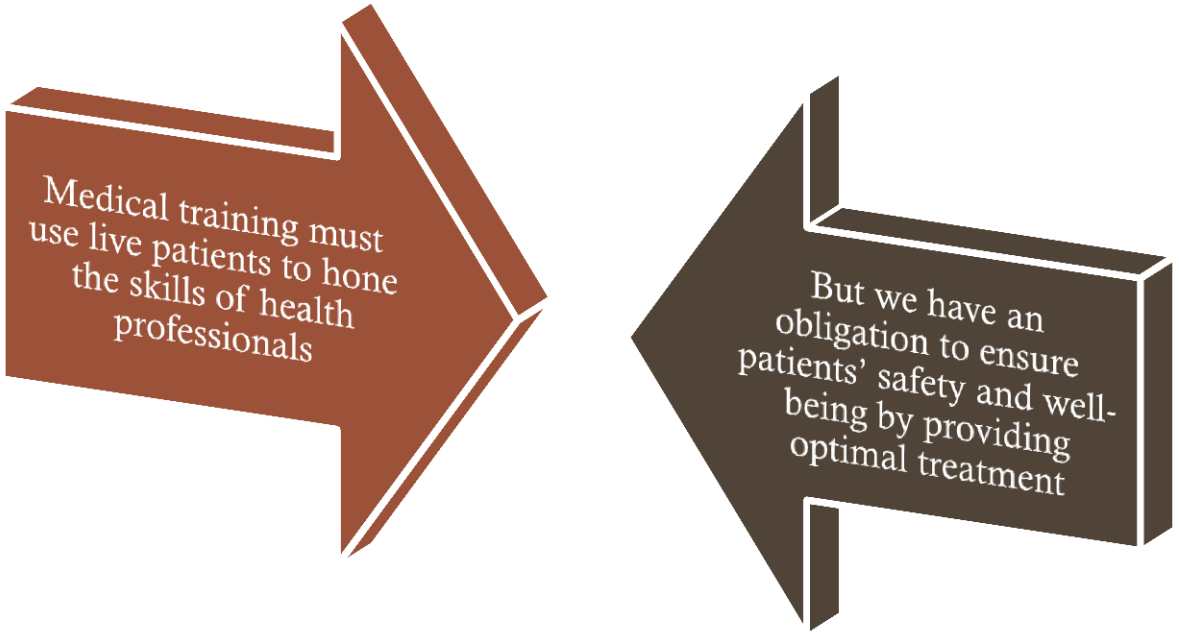
- *"Created guided experiences that mimic real-world processes or conditions to achieve educational goals."*

- *"The artificial replication of sufficient components of a real-world situation to achieve certain goals."*

Why Simulation?

- Medical Errors "The freedom to make mistakes and to learn from them"
- Patient's Rights
- Medical Legal issues
- A range of easily accessible learning opportunities
- The learning experience can be customized
- Detailed feedback and evaluation
- Outcomes?

Simulation-Based Medical Education SBME



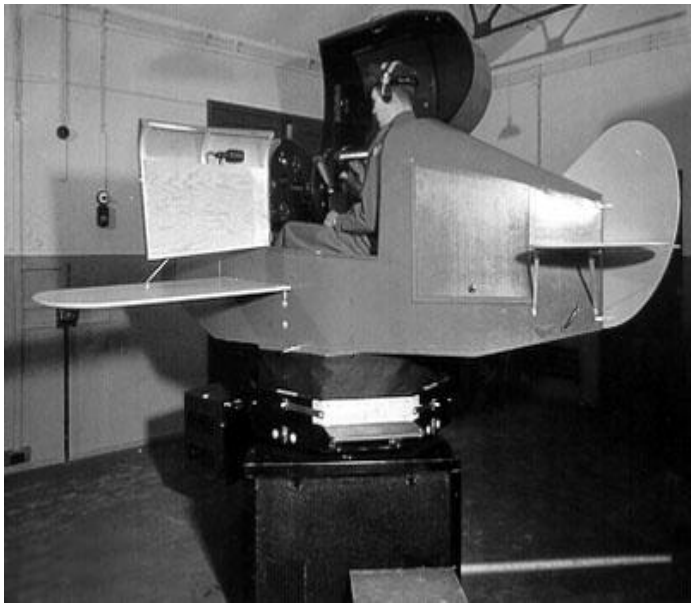
SBME can mitigate this tension:

- Best standards of care and training
- Error management and patient safety
- Patient autonomy & Social justice

History

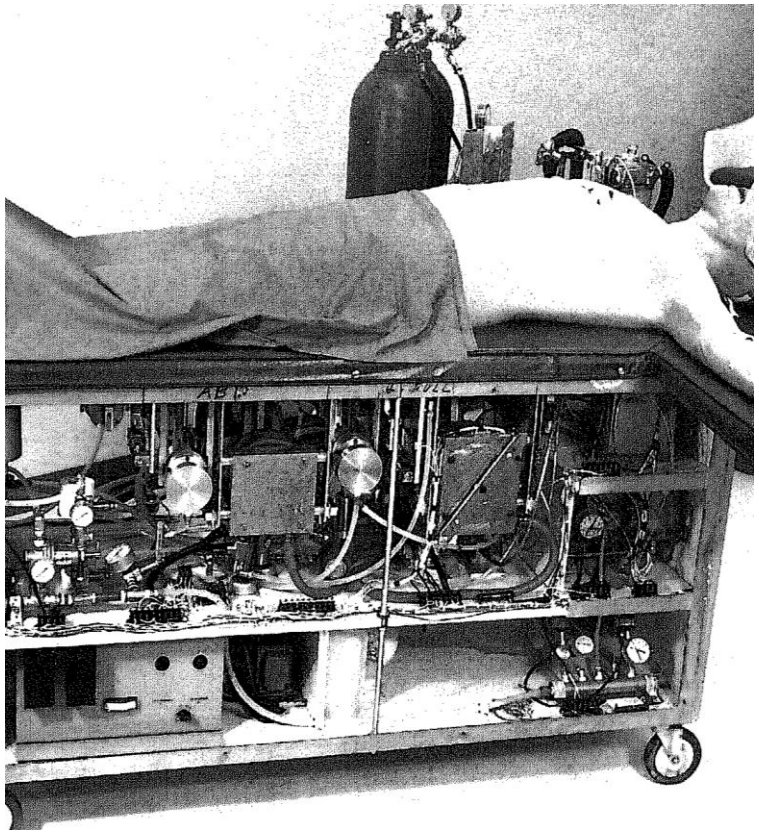
- Animal models for medical simulation have been used for over 2,000 years

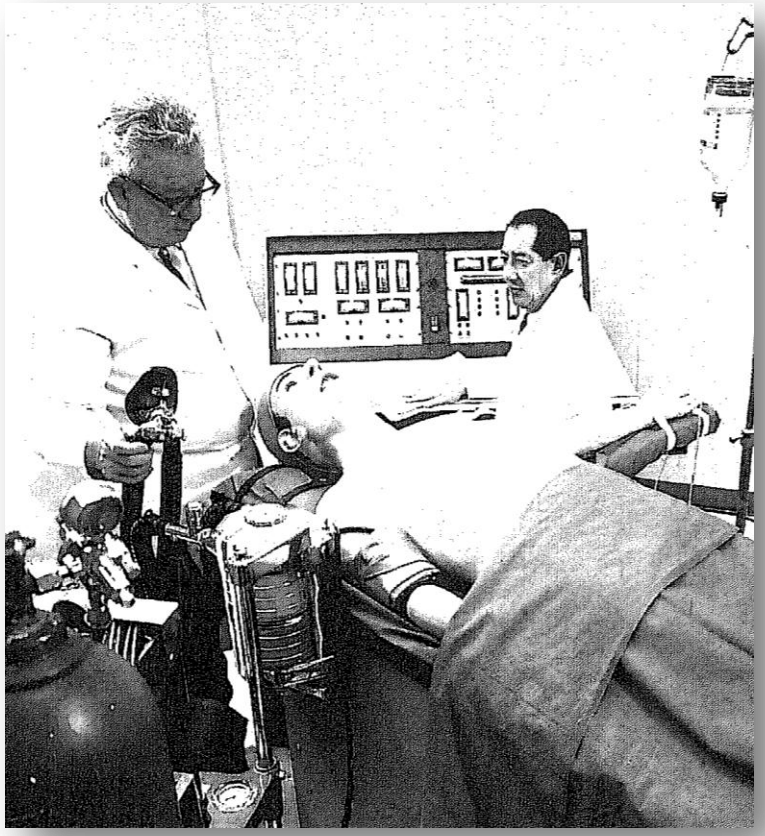
- First aviation simulator developed in 1928 by Edwin Link



- 1960 – First manikin specifically built for resuscitation was introduced – Resusci Annie

History



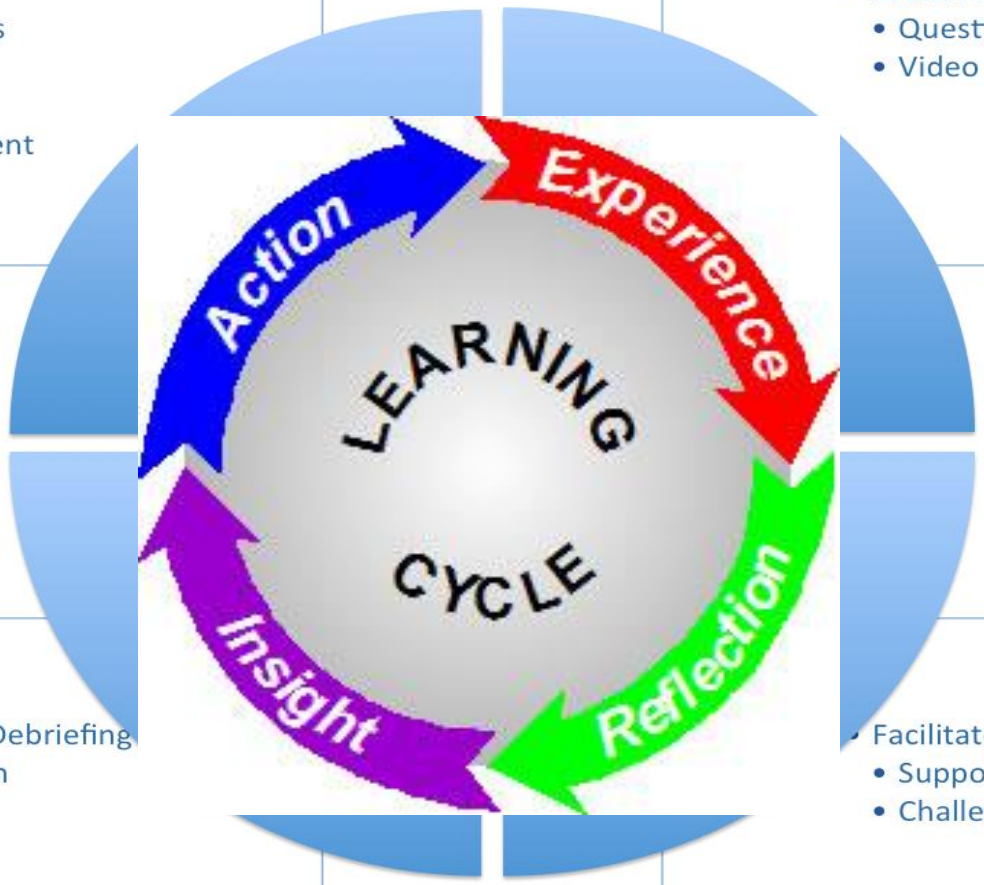


1969 – SimOne developed as the first computer controlled patient simulator

Theory; How it works…

- Simulation
  - Objectives
  - Safety
  - Fidelity
  - Engagement

- Facilitated Debriefing
  - Questions
  - Video



- Facilitated Debriefing
  - Distillation
  - THM's

- Facilitated Debriefing
  - Support
  - Challenge

Simulation; Does It Work?

- Simulation-based education (SBE) provides a structured, learner-centered environment in which novice, intermediate, and advanced practitioners can learn or practice skills without causing harm to patients
- A range of systematic reviews indicate that simulation-based medical education can improve:
  - Knowledge
  - Skills
  - Performance
  - CRM principles
  - Patient outcomes

Simulation; Does It Work?

- Evidence of the effectiveness of carefully implemented simulations: A review of 109 studies looked at whether medical simulations actually facilitate learning
- The best available evidence shows a benefit for simulations when four conditions are met:
  1. Educational feedback is provided
  2. Learners are given the opportunity for repetitive practice
  3. Exercises based on the simulation are integrated with curriculum
  4. Tasks range in difficulty

Editorial – Med Teacher 2005;27: 10-28

Simulation Modalities

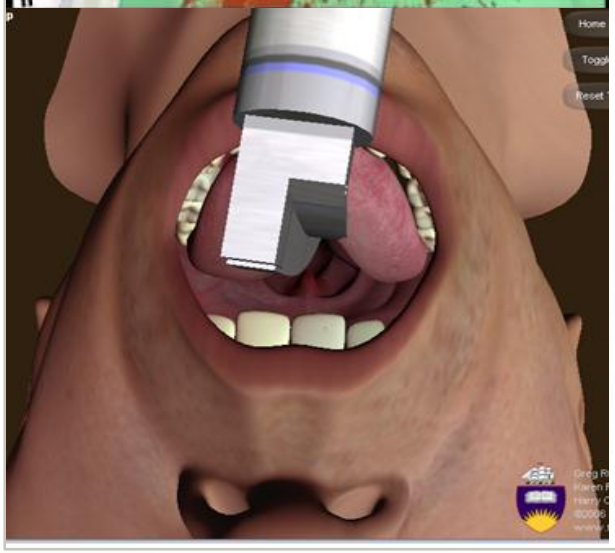
1. Standardized Patients
2. Computer and Web-based Simulators
3. Mannequin Based Simulators
4. Virtual Reality & Haptic Simulators

Simulation Modalities

Standardized Patients

Simulation Modalities

Computer and Web-based Simulators



Simulation Modalities

Mannequin Based Simulators

Simulation Modalities

Virtual Reality & Haptic Simulators

FIDELITY

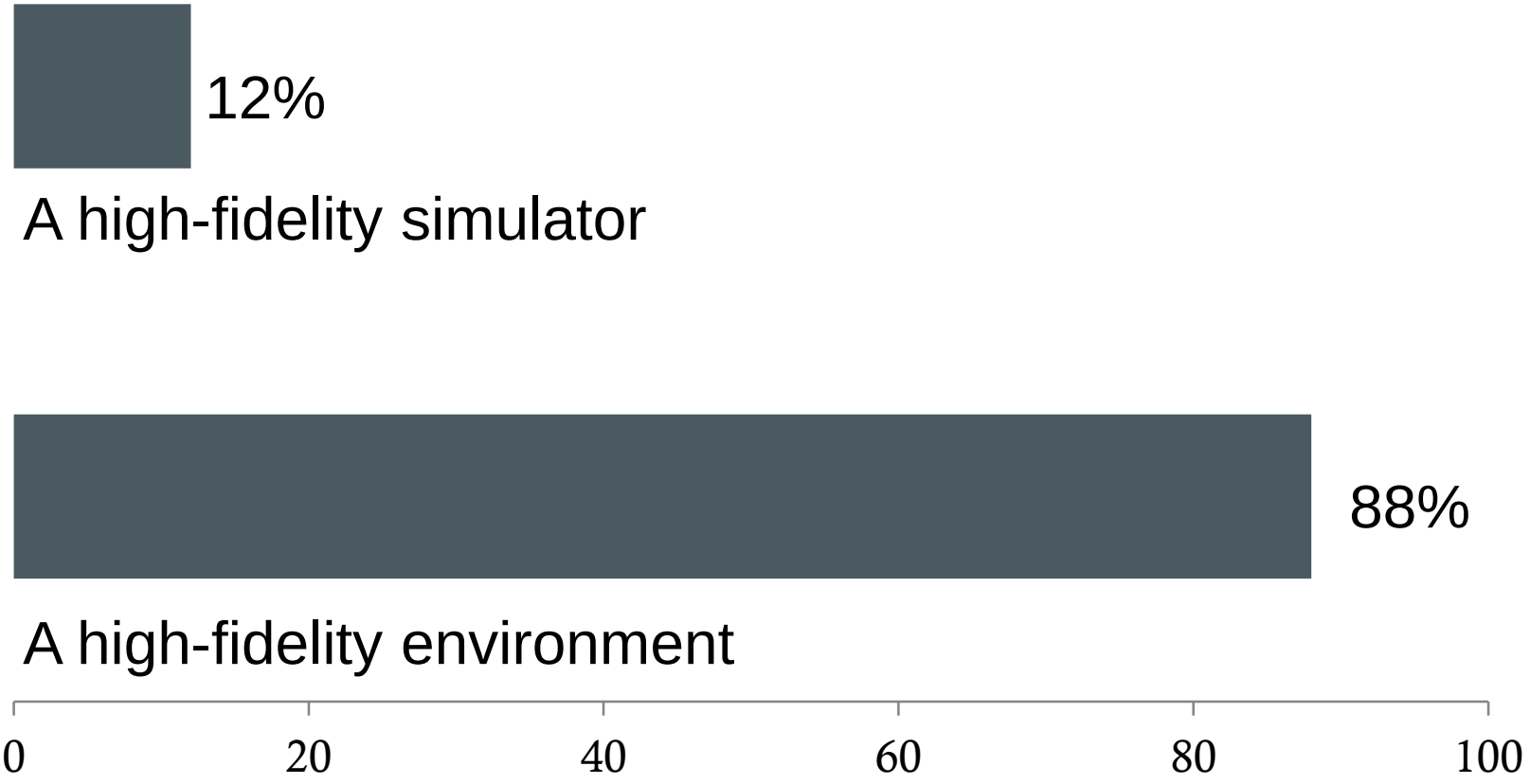
"Fidelity is the extent to which the appearance and behavior of the simulator/simulation match the appearance and behavior of the simulated system."

- **Low-fidelity** simulators are focused on single skills and permit learners to practice in isolation.
- **Medium-fidelity** simulators provide a more realistic representation but lack sufficient cues for the learner to be fully immersed in the situation.
- **High-fidelity** simulators provide adequate cues to allow for full immersion and respond to treatment interventions


80
99


179
93

Which is more important for most learning events …?



Dieckmann, P. (2008). How much realism is needed in medical simulation? Presentation at the International Meeting on Simulation in Healthcare, San Diego, Ca.

Applications

- Education
- Assessment
- Research
- Patient Safety
- Health System Integration

Challenges

- Cost $$$$$
- Educators (not subject matter experts)
- Integration to curriculum
- Administrative and logistics

Simulation Rules

- Confidentiality agreement
  - (Scenario / Performance)
- Fiction Contract
- Basic assumption
  - Good intention / Competence

SIM Orientation Briefing

- The manikin will NOT be speaking!
- The instructor will play the voice of the patient, relatives, consults, etc…
- All physical findings can be obtained through directly examining the simulator. If in doubt, ask the instructor!
- The simulator can be used for all IV access, Intubation with all equipment, DC Shocked (name the amplitude but set @20 to prevent injuries), Pacing, Needle & Tube thoracotomy, and Medication administration. If in doubt, ask the instructor!

Thank You!

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