Simulation in CPR Training

ABDULLAH M KAKI, MD, FRCPC
PROFESSOR AND CONSULTANT, DEPARTMENT OF ANESTHESIOLOGY AND CRITICAL CARE, FACULTY OF MEDICINE, KING ABDULAZIZ UNIVERSITY
Disclosure

- Nothing to disclose
Objectives

• To define simulation
• To cover the advantage of simulation in training
• To discuss the types and the use of simulation in CPR training
• 383,000 OH sudden cardiac arrests/ yr, 88 % at home.
• In KSA, there is increasing number of MVA(26 deaths/ day)
• 28% death rate, WHO, 2015.

• AHA.2011CPR & Sudden Cardiac Arrest (SCA)
Cardiac Arrest (crucial moment in patient’s life)

- Sometimes the least experienced provider:
  Chest compressions, Managing the airway,
  Running the code or perform high task skill.
- See one, do one, teach one
- Training healthcare providers
- Performance of CPR concentrates on: timing, technique, teamwork and communication.
“Tell me, and I will forget.
Show me, and I may remember.
Involve me, and I will understand.”

Confucius, 450 BC

“Unbelievable. Smoking a cigarette while shoveling snow. Did he leave a note?”
Simulation

• Educational tool:
• Allows learner to practice patient care, away from bedside, in a controlled and safe environment,
• Gives opportunity to practice and self-reflection.
• No potential for adverse consequences to patients.
• Adult learners: independent, self-directed, and internally motivated to learn; seek immediate applications for the knowledge gained.
• Adults learn faster and have greater retention of knowledge when they participate in an interactive setting.
• Patients are no longer passive. Patients also have an increased awareness to medical errors.

What is simulation?

• Immersion of a trainee in a realistic situation (scenario) created within a physical space (simulator) that replicates the real environment with fidelity sufficient to achieve suspension of disbelief on the part of the trainee.

• Adapted from: aerospace, the military, and nuclear power.
Classification Of Simulation

- standardized patient,
- screen-based computer,
- partial-task trainer,
- hybrid simulators,
- high-fidelity simulators,
- virtual reality simulators.
• Retrospective evaluation of 2nd-yr internal medicine residents simulation-based educational intervention with routine clinical education for cardiac arrest teams.
• Using checklists for 6 common AHA- ACLS scenarios.
• Simulator-trained residents were 7 times > adhere to the ACLS scenarios than non-simulator-trained residents.

Figure 2

CHEST 2008 133, 56-61 DOI: (10.1378/chest.07-0131)
• RCT: Participants were randomized to either a traditional- or simulator-trained arm.
• Evaluated at 3 & 6 months later.
• Improvement in residents who participated in simulations.

New Training Methods

• **Human patient simulators**
  
  • HPS are computer-operated, life-size mannequins capable of physiologically reproduction of human disease signs.
  
  • Student is simultaneously exposed to the realism of the event
  
  • Used in routine training and for competency testing.


Maintenance of Skills

- Procedural or crisis management skills decline with time
- Simulation training leads to maintenance or decreased decline of learned skills.

Randomized clinical simulation designed to evaluate the effect of telemedicine using Google Glass on cardiopulmonary resuscitation (CPR)


- Telematics support through Google Glass from an expert physician on performance of CPR by a group of nurses
- Randomized study, 72 nurses; 36 nurses received coaching from physicians through GG, while 36 did not receive any coaching (controls).
- Outcome: successful defibrillation to restore sinus rhythm.
**Information:**
- Hospital room
- 67 years old male

**Situation, vital signs and symptoms:**
- Manikin in supine position lying in bed
- Glasgow Coma Scale 3 (1/1/1)
- Electrocardiogram: Ventricular Fibrillation
- Pulseless

**Situation, vital signs and symptoms:**
- Manikin in supine position lying in bed
- Glasgow Coma Scale 15 (4/5/6)
- Anginal chest pain and thumping heart sensations
- Electrocardiogram: supraventricular tachycardia 180 bpm
- Patient with intravenous catheter

**Resources during CPR:**
- Defibrillator
- Oxygen
- Bag-mask
- Self-inflating bag
- Supraglottic airway device
- Tracheal intubation equipment
- Adrenaline
- Amiodarone

**Time:**
- 2 minutes
- 0 minutes
- 10 minutes

**Cardiopulmonary Arrest:**
- Precordial thump
- Early Defibrillation
- 2 min of CPR
- Defibrillation
- 2 min of CPR
- Defibrillation

**Exit of the scenario:**
- Successful Defibrillation
- Unsuccessful Defibrillation
Candidate Debriefing

• Most important learning activity of the simulation experience.
• Participants evaluate their own teamwork, clinical skills, judgment, communication, and compliance with evidence-based practice.

• Systematic analysis
• From 10,903 articles: 967 comparative studies. 59 studies (6.1%) reported any cost elements and 15 (1.6%) provided information on cost compared with another instructional approach.
• Conclude that cost reporting in SBME research is infrequent and incomplete.
Conclusion

• Learning and retention is maximized.
• Simulation provides repetition and multiple experiences involving different and infrequent scenarios.
• Simulation allows for the measurement of the CPR target parameters.
• HFS appears to have the most promise in the training of medical staffs.
• Questions remain unanswered. Does simulation result in acceptable levels of clinical compliance and improve patient outcome?
• More future use.
Our aim: to train all Saudis to perform adequate CPR
Thanks
Time for:
   Question
   Comment
   Suggestion

Abdullah Kaki