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Program Director’s Training Course: Focused Topics
Use of Simulation in Medical Education
Common Formats

- Computer based virtual reality simulators
- High fidelity and static mannequins
- Plastic models
- Live animals
- Inert animal products
- Human cadavers
Does it work?

- Meta-analysis
- Published JAMA 2011;306(9):978-988
- 609 studies
- 35,226 trainees
- Improvements noted in:
  - Knowledge
  - Skills
  - Behaviors
Laparoscopy

- Laparoscopy is different from open surgery
  - Proficiency in ambidextrous maneuvers
  - New instruments
  - Enhanced hand-eye coordination
  - Depth perception
- Training in the field
  - With other laparoscopists
  - Practice with animal models
Laparoscopic Simulators

- Standardized controlled environment
  - No patient risk involved
- Simulators can assess
  - Hand-eye coordination
  - Cutting technique
  - Placement of surgical clips
  - Ligating loops
  - Mesh materials
  - Needle transfer
  - Suture placement
  - Knot tying skills
Laparoscopic Simulators

- Predictors of performance:
  - Level of training
  - Frequency of skill repetition
Life sized mannequin
Simulates a number of cardiac conditions
It provides
- Blood pressure
- Pre cordial impulses
- Auscultatory in 4 areas
  - Synchronized with peripheral pulses and respirations events
- Pulses
  - Bilateral venous
  - Carotid
  - Peripheral arterial
Harvey Cardiology Patient Simulator

- Comes also with a curriculum
- Teaching manual
- Test instruments
- Self assessment slide programs
  - History
  - Blood tests
  - Invasive and non invasive data
- Medical and surgical therapy
- Summary of the pathology and epidemiology of each disease.
Can be used for a variety of levels of experience

- Beginning student
  - Blood pressure
  - Recognize a heart murmur
- Senior medical student
  - Heart sounds and respiration
  - Normal and abnormal jugular and carotid pulsations
- Post graduate
  - For more complex cardiac disease
  - Can be used in large audience settings

In a study it improved skills but not professional behavior
Simulation Issues

- Dehumanization effect of technology
- Advantage of prior training before touching a patient
- Enhancement of diagnostic skills and thus less use of ancillary resources
- Cost considerations
  - Self learning versus teacher-student time at bedside
  - Better structured feedback than with a clinician
  - Verghese’s suggestion: combine technology with the bedside.
End of Presentation