



A Clinical Perspective on Medical Simulation

MICCAI 2003 Tutorial

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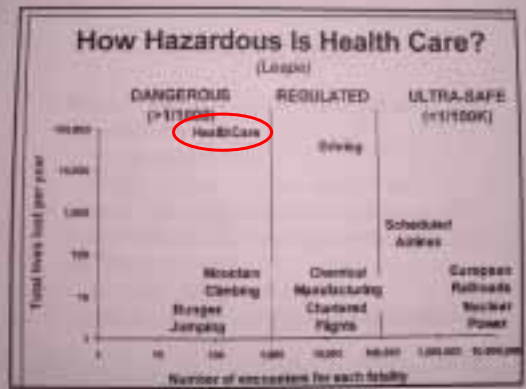
<http://simcen.usuhs.mil/miccaai2003>

THE NEED FOR SIMULATION IN MEDICAL AND SURGICAL EDUCATION?

Challenges in Medical Education

- Less physician teaching time
- Less resident time
- Fewer patient hours available for teaching
- Larger number of procedures
- Teaching high risk procedures without endangering patients
- **"To Err is Human"** Institute of Medicine report

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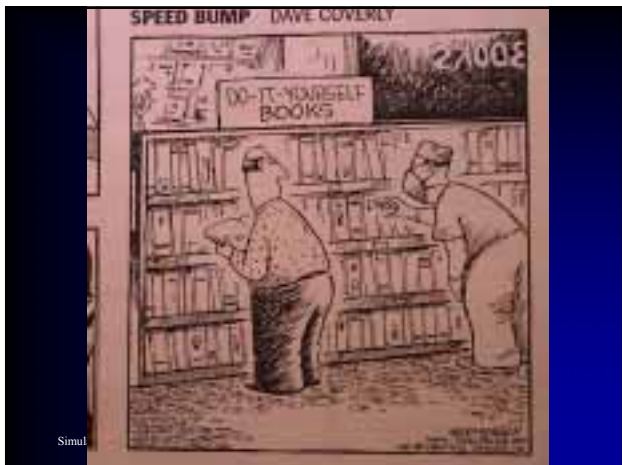
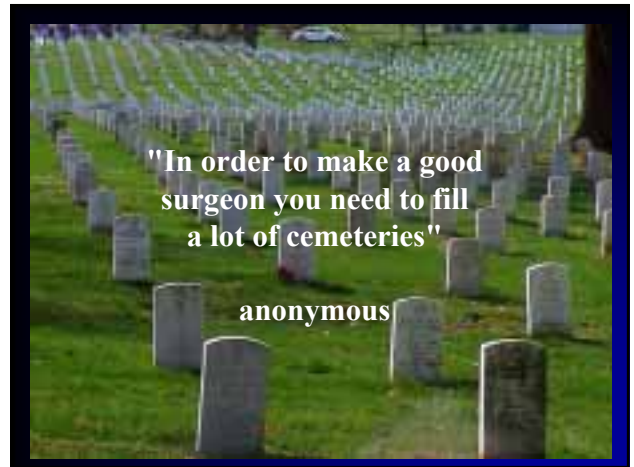
Traditional Surgical Education

- Apprenticeship
- See one, do one, teach one
- Learning on patients

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Simulators in Medical Education

- Need a safe transition from book to patient
- Solution:

Medical Simulators

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Why Simulation?

- IOM Report 2002 – “To Err is Human: Building a Safer Health System”
- 44,000 Americans die from medical errors every year
- Recommend that Health Care Org incorporate proven methods of training such as SIMULATION

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“Proven Methods”

- Anesthesia – has established curricula for team training and crisis management with demonstrated outcome improvement after Sim training.
- In Mass. Anesthesiologists who have had simulator training receive a discount on malpractice

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Simulation for Error Reduction

- New techniques can be practiced over and over, alone or with a mentor, without the need for animals
- Errors can be tracked while the operation continues, until error recognized ... simulator rewind or restarted

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Chinese Proverb

***“I hear and I forget,
I see and I remember,
I do and I understand.”***

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DEJA VU IS A GOOD THING
FOR A PILOT TO FEEL WHEN
WALKING INTO A COCKPIT.



Simulation for M

Additional benefits of Simulators

- Permit learning in safe/risk free environment
 - **“Permission to Fail”**
- Refresh techniques for surgeons after absence (military)
- Correct for case-mix inequalities in training program

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Potential of Simulation

- Allow boards to certify skill rather than oral discussion
- Permit prototyping *“in silico”*
- Testing of new devices in a simulated environment
- Patient specific rehearsal of operations

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What is Required

- **REALISM** – realistic organ responses, tissue-tool interaction, visual display
- **AUTHENTICITY** – Educational content that is clinically useful and provides validated transfer of learning
- **ACCEPTABILITY** - teaching physicians and specialty organizations

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Simulation for

Surgical Certification

- Written examination
- Oral examination
- No technical skills examination
- Interest exists in using simulators to certify surgeons
- Recertification

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Medical Simulation Where We Are Today

Two side-by-side photographs. The left one shows a medical training mannequin in a clinical setting. The right one shows a blue, boxy medical simulator on a stand.

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Where We Want To Be

A photograph of a modern medical simulation suite with multiple stations, large monitors, and complex equipment.

Simulati

A photograph of a tall, decorated Christmas tree in an outdoor setting, with a yellow truck parked nearby.

Where do we go from here?

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SIMULATION WILL BE READY FOR PRIME TIME WHEN PROponents CAN SHOW THAT CLINICALLY USEFUL LEARNING RESULTS FROM SIMULATOR USE



The Way Forward

- Collaboration
- Integration
- Validation and Verification
- Innovation
 - Increased Realism
- “Bleeding Edge”
- Create a National Agenda (\$\$\$)
- Involve End Users Early

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Can You Simulate This?



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Or This?



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