M M V R **2 0 0 4**

Medical Simulation Tutorial: The State of the Art and Beyond

National Capital Area Medical Simulation Center

A Clinical Perspective on Medical Simulation
MMVR 2004 Tutorial

Col. Mark W. Bowyer, MD, FACS
Associate Professor of Surgery
Surgical Director
National Capital Area Medical Simulation Center
Uniformed Services University
Bethesda, MD
http://simcen.usuhs.mil/MMVR2004

# IS THERE A NEED FOR SIMULATION IN MEDICAL AND SURGICAL EDUCATION AND PRACTICE?

Medical Simulation Tutorial: The State of the Art and Beyond

Challenges in Medical Education

· **Less physician teaching time**
· **Less resident time (80 hr work wk)**
· **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

Medical Simulation: The State-of-the-Art and Beyond (MMVR 2004)

How Hazardous Is Health Care? (Leape)

Is this safer than being a patient?
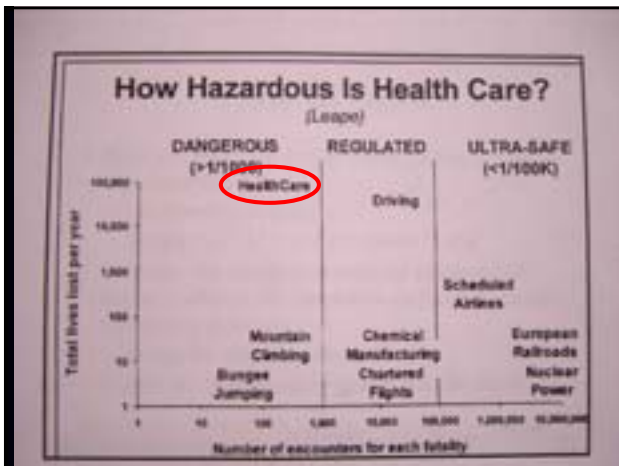
Institute of Medicine

- 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

Institute of Medicine Report

- Preventable adverse events in US hospitals result in $17- $29 B annually
- Simulation is "a procedure to mitigate injury"
- "health care organizations and teaching institutions should participate in the development and use of simulation for training"

"To err is human"

Nobody's perfect.

ORKIN

It's Not Rocket Science….

NASA — What, and you're perfect?

…. It's More Important Than That.

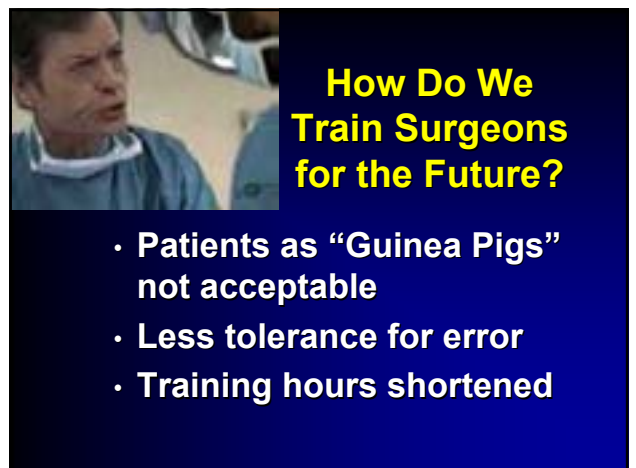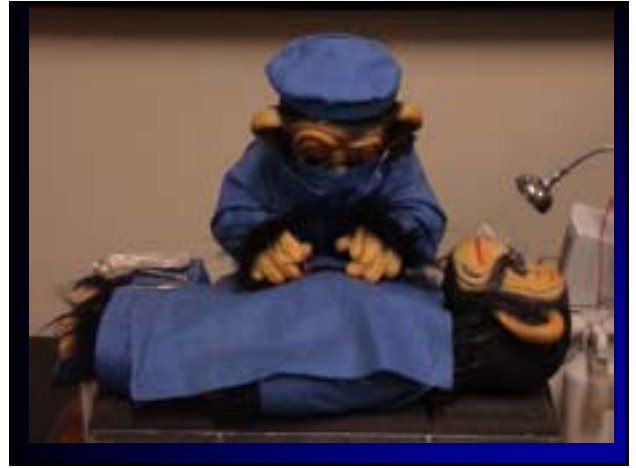## How do we Minimize Error?

Traditional Surgical Education

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

KILL AS FEW PATIENTS AS POSSIBLE

"In order to make a good surgeon you need to fill a lot of cemeteries"

anonymous

You too can be a Surgeon…..

….or at least look like one!

Medical Simulation: The State-of-the-Art and Beyond (MMVR 2004)

How Do We Train Surgeons for the Future?

· Patients as "Guinea Pigs" not acceptable
· Less tolerance for error
· Training hours shortened

Divine Intervention?

Hologram
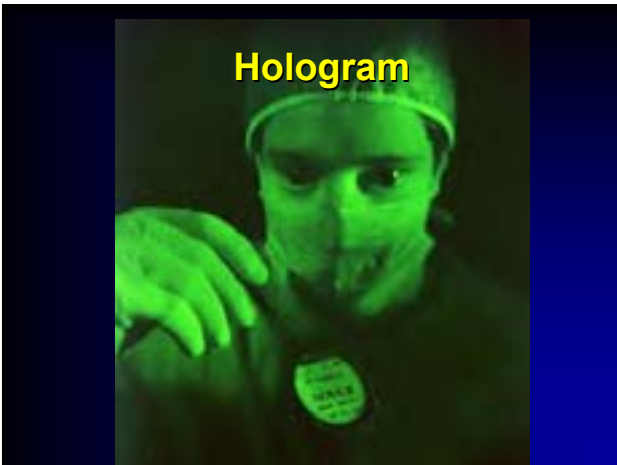
Simulators in Medical Education

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

"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

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 rewound or restarted

Chinese Proverb

"I hear and I forget,
I see and I remember,
I do and I understand."

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

BOEING

Train to proficiency?

dribbleglass.com

Giving someone the
finger doesn't have to
be a bad thing.
American School of Proctology

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**

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**

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**
- **ACCEPTABILTY- teaching physicians and specialty organizations**

Can You Simulate This?

Or This?

Medical Simulation
Where We Are Today

Where We Want To Be
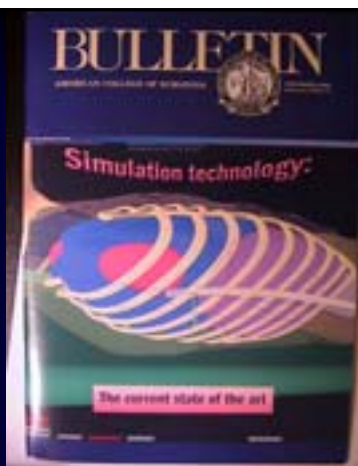
ACS Proposed uses
of Simulation

· **Screening for aptitude**
· **Provide initial training**
· **Promote ongoing education**
· **Enable periodic assessment**
· **Maintain proficiency through rehersal pt specific procedures**

Surgical Certification

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

Where do we go from here?

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

VALIDATION
VALIDATION
VALIDATION

The Way Forward

- Collaboration & Integration
- Validation and Verification
- Innovation
  - Increased Realism
- "Bleeding Edge"
- Create a National Agenda ($$$)
- Involve End Users Early
- Incorporate into curriculum

Thank You!