

Presentation for the Simulation Faculty Learning Community  
U. Florida at Gainesville  
July 14, 2008  
Bruce Nappi



CSESaR

Center for Simulation Education and Safety Research



# Presentation Topics

- Overview of the facilities
- Types of simulation available and typical equipment
- Advantages and disadvantages
- Outreach to the medical device and pharmaceutical community
- School of the Medical Arts Project



# Facilities



14,000 square foot former Operating Room Suite with 12 rooms

7000 square foot former hospital  
Emergency Department with 14 rooms

**2700 sq ft of classroom**

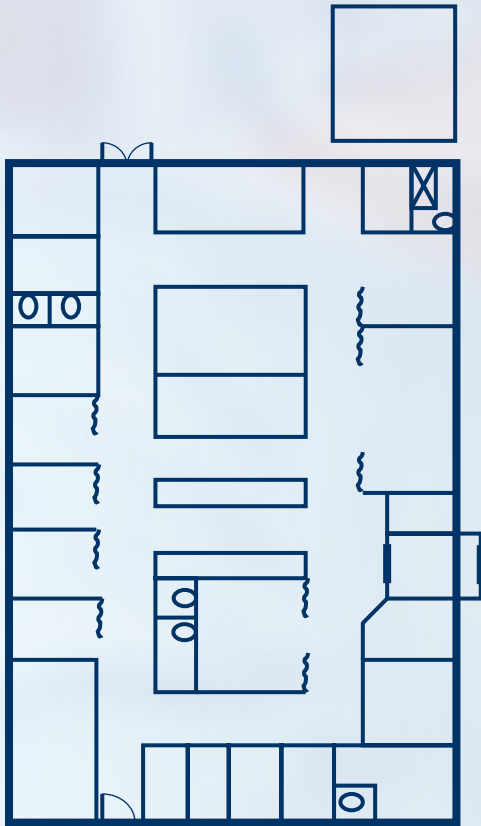
This view shows the building before a new CT / MRI building was built on the parking lot area.



At 23,700 sq. ft. , **CSESAR** is still the largest non-military medical simulation training facility in the U.S. (2008)

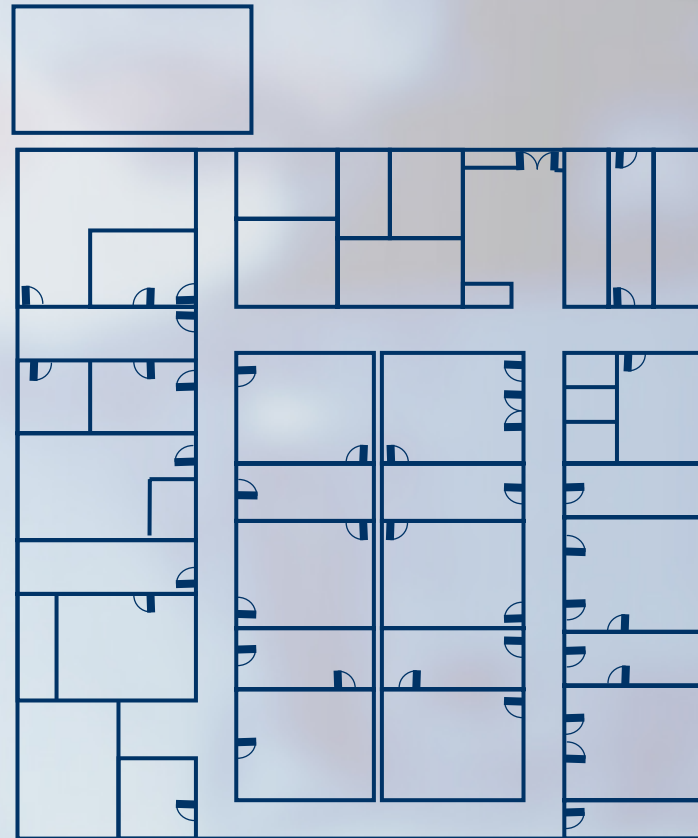


# Facilities – Floor space



**First Floor**

70' X 100' = 7000 Sq. ft.



**Second Floor**

115' X 123' = 14,145 Sq Ft





# Facilities – Emergency Room





# Facilities – Operating Room

Noelle birthing simulator  
draped for GYN  
procedures using hybrid  
materials





# Types of Simulation

- Robots ( manikins )
- Task trainers
- Standardized patients
- VR
- Hybrids



# Robots



SimMan



SimBaby





# Robots



SimMan with trauma components



Replaceable physiology



# Robots



Ultrasound Trainer





# Task Trainers





# Task Trainers





# Standardized Patients





# Virtual Reality





# Virtual Reality

## Emergency Response



## Medical Procedures Training



Screen shots from [www.forterrainc.com](http://www.forterrainc.com)





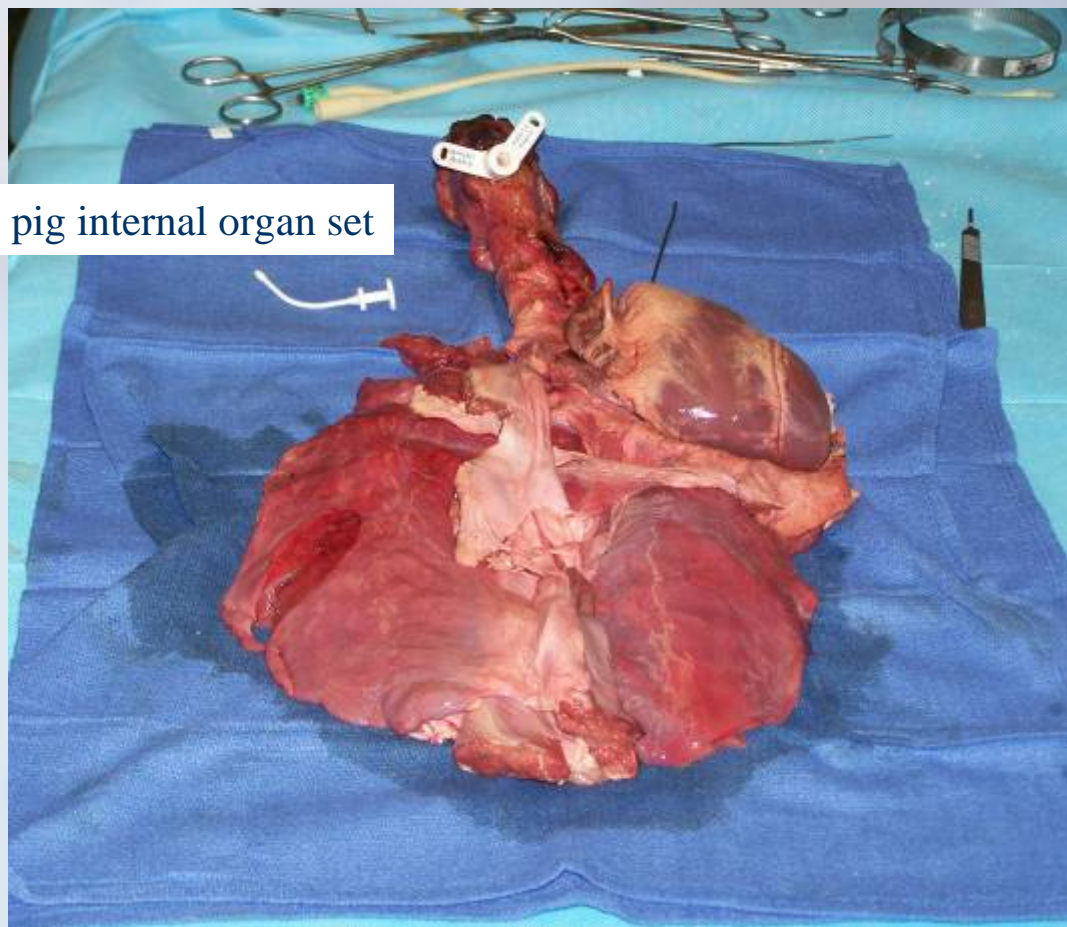
# Hybrid Simulation

We use “Hybrid” to mean a combination of simulation types. Shown here is food-grade animal tissue that will be put into a robot.



. . Or plastic attached to a standardized patient.

Full pig internal organ set







# Hybrid Simulation

Full pig internal organ set



Laparoscopic



Open surgery





# Advantages

- Improve professional competency
- Broaden experience
- Improve patient safety
- Reduce training costs



# Advantages



- **Improve professional competency**
- Broaden experience
- Improve patient safety
- Reduce training costs



# How Does Simulation Improve Competency?

- Experience and repetition develop skills and improve coordination  
“see one, do one” could become “see many, practice many, do one”

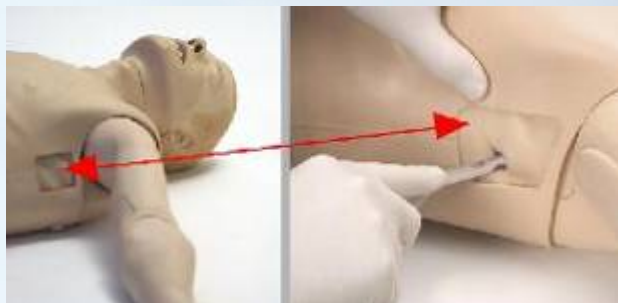






# How Does Simulation Improve Competency?

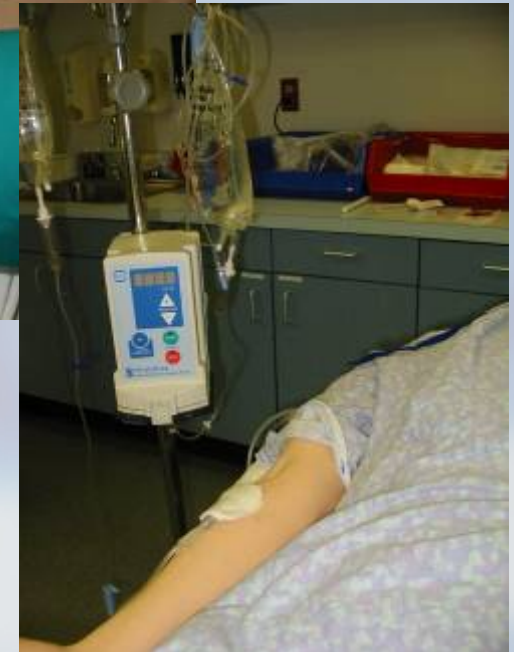
- Experience and repetition develop skills and improve coordination  
“see one, do one” could become “see many, practice many, do one”





# How Does Simulation Improve Competency?

- Students can experiment with and feel the limits of procedures without fear of harming patients





# How Does Simulation Improve Competency?

- Complex procedures can be learned in a gradual stepwise process  
( and without all the pressure )

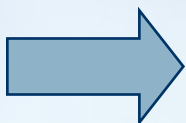






# Advantages

- Improve professional competency
- Broaden experience
- Improve patient safety
- Reduce training costs







# How Does Simulation Broaden Experience?

- Students can directly experience a very large range of illness and injury including rare pathologies.

# How Does Simulation Broaden Experience?

- Students can directly experience a very large range of illness and injury including rare pathologies.





# How Does Simulation Broaden Experience?

- Students can directly experience a very large range of illness and injury including rare pathologies.
- Experiences can be presented in a wide variety of environments: organized, chaotic, benign, hostile, U.S. , foreign, land based, sea based, on earth, in space.





# How Does Simulation Broaden Experience?

- Experiences can be presented in a wide variety of environments: organized, chaotic, benign, hostile, U.S. , foreign, land based, sea based, on earth, in space.







# Advantages

- Improve professional competency
- Broaden experience
- ➔ ■ Improve patient safety
- Reduce training costs



# How Does Simulation Improve Patient Safety?

- Training errors do not harm patients.
- Improved skills and competency reduce practice errors.
- Broader experience reduces errors where a practitioner must give treatment without prior experience.



# How Does Simulation Improve Patient Safety?

- Improved **teamwork** skills and competency reduce practice errors.





# Advantages

- Improve professional competency
- Broaden experience
- Improve patient safety
- ➔ ■ Reduce training costs





# How Does Simulation Cut Training Costs?

- The occurrence of simulated illnesses or injuries can be **scheduled**.  
Training schedules can be much more efficient.



# How Does Simulation Cut Training Costs?

- The occurrence of simulated illnesses or injuries can be scheduled. Training schedules can be much more efficient.
- Students can **practice** many procedures without direct faculty supervision, **effectively** allowing an increased student to faculty ratio.



# How Does Simulation Cut Training Costs?

- The occurrence of simulated illnesses or injuries can be scheduled. Training schedules can be much more efficient.
- Students can **practice** many procedures without direct faculty supervision, **effectively** allowing an increased student to faculty ratio.
- **Faculty can “self-study” new procedures, effectively reducing faculty training costs.**





# How Does Simulation Cut Training Costs?

- The occurrence of simulated illnesses or injuries can be scheduled. Training schedules can be much more efficient.
- Students can **practice** many procedures without direct faculty supervision, **effectively** allowing an increased student to faculty ratio.
- Faculty can “self-study” new procedures, effectively reducing faculty training costs.
- **Simulation materials are less costly than either animal or cadaver tissue.**



# How Does Simulation Cut Training Costs?

- The occurrence of simulated illnesses or injuries can be scheduled. Training schedules can be much more efficient.
- Students can **practice** many procedures without direct faculty supervision, **effectively** allowing an increased student to faculty ratio.
- Faculty can “self-study” new procedures, effectively reducing faculty training costs.
- Simulation materials are less costly than either animal or cadaver tissue, standardized patients.
- **Improved patient safety produces lower malpractice costs.**



# Advantage / Disadvantage Summary

Realism	Low	<u>T VR R</u>	<u>H SP</u>	<u>P</u>	High	
Flexibility	Low	<u>P R T H SP</u>		<u>VR</u>	High	
Cost	Low	<u>T VR SP</u>	<u>H</u>	<u>R P</u>	High	
Availability	Low	<u>P</u>	<u>SP</u>	<u>R H T</u>	<u>VR</u>	High
Safety	Low	<u>P</u>	<u>SP</u>	<u>H R T</u>	<u>VR</u>	High
Novice Learning	Low	<u>P</u>	<u>SP</u>	<u>H R T VR</u>	High	

R = robots

T = task trainers

SP = standardized patients

VR = virtual reality

H = hybrids

P = human patients





# Outreach to the Medical Device Community

- Good medicine is a combination of good skills and good equipment
- The medical device community has educational programs that are state-of-the-art
- Medical schools, working with industry broadly, have more flexibility than hospitals under ethics rules



# Industry Outreach – Laparoscopy



Laparoscopic towers plus trocars and lap tools provided by Ethicon and Storz



# School of the Medical Arts

- One of the first new grade 6-12 medical magnet high schools funded by DoE
- Curriculum needs to be developed with the perspective that students will not use it in practice for 8-15 years
- The curriculum needs to be designed around state-of-the-art training tools and methods
- The curriculum needs to be design for today's learning skills. Hands-on simulation will play a key role
- The curriculum needs to be coordinated with pre-med and medical school programs
- The program anticipates broad national and international support across all medical specialties
- The strongest early support has come from the military



For information concerning CSESaR programs, please contact:

*Bruce Nappi* MSc

Administrative Director

CSESaR

Center for Simulation Education and Safety Research

University of Florida College of Medicine

Jacksonville, FL 32209

(904) 244-1120

[bruce.nappi@jax.ufl.edu](mailto:bruce.nappi@jax.ufl.edu)

<http://www.hscj.ufl.edu/csesar/>