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

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

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

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Facilities – Floor space

First Floor
70’ X 100’ = 7000 Sq. ft.

Second Floor
115’ X 123’ = 14,145 Sq Ft

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Noelle birthing simulator draped for GYN procedures using hybrid materials
Types of Simulation

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

SimMan

SimBaby

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Robots

SimMan with trauma components

Replaceable physiology

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Robots

Ultrasound Trainer

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Task Trainers
Task Trainers

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Standardized Patients

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Virtual Reality

Emergency Response

Screen shots from www.forterrainc.com

Medical Procedures Training

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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.
Hybrid Simulation

Full pig internal organ set

Laparoscopic

Open surgery

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Advantages

- Improve professional competency
- Broaden experience
- Improve patient safety
- Reduce training costs
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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”
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“see one, do one” could become “see many, practice many, do one”

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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

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How Does Simulation Broaden Experience?

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- 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.
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Advantages

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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

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- 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

<table>
<thead>
<tr>
<th>Advantage / Disadvantage</th>
<th>Low</th>
<th>High</th>
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<tbody>
<tr>
<td><strong>Realism</strong></td>
<td>T VR R</td>
<td>H SP P</td>
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<tr>
<td><strong>Flexibility</strong></td>
<td>P R T H SP VR</td>
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<td><strong>Cost</strong></td>
<td>TVR SP H R P VR</td>
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<tr>
<td><strong>Availability</strong></td>
<td>P SP R H T VR</td>
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<td><strong>Safety</strong></td>
<td>P SP H R T VR</td>
<td></td>
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<tr>
<td><strong>Novice Learning</strong></td>
<td>P SP H R T VR</td>
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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

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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 designed 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:

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