

# eSimulation can Replace Lecture

Summary of Research Study 2009

Improving Learning of Airway Management with Case-based Computer Microsimulations

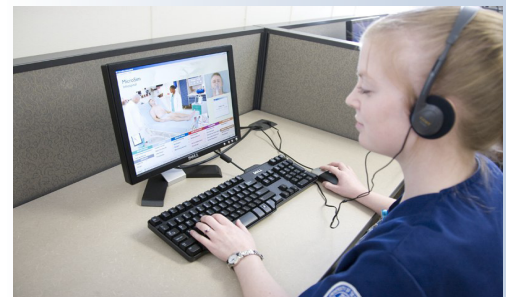
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## Introduction

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### Study Addressing Neomillennial Learning Styles in Nursing Education

The traditional classroom lecture is being challenged by larger class sizes and rising student/faculty ratios and by students looking for alternative learning modes. Fluent in multiple media, the neomillennial student seeks more personalized learning experiences, values direct participation and guidance, and prefers active learning based on real situations with opportunities for reflection. As computer based self-directed learning systems with patient scenarios designed to train medical knowledge, problem solving and decision-making skills fit right into the neomillennial mind set, there was an interest in exploring whether this learning tool was at least as effective and efficient as traditional classroom lecture.



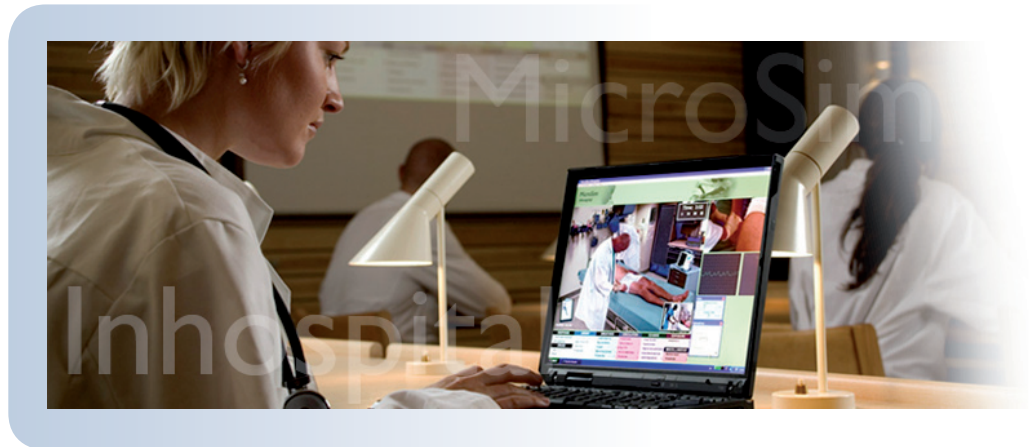
## Purpose of Study

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The purpose of this study was to evaluate the usefulness of eSimulation in learning the principles and concepts of airway management by comparing learning outcomes achieved with eSimulation to those achieved with traditional lecture.

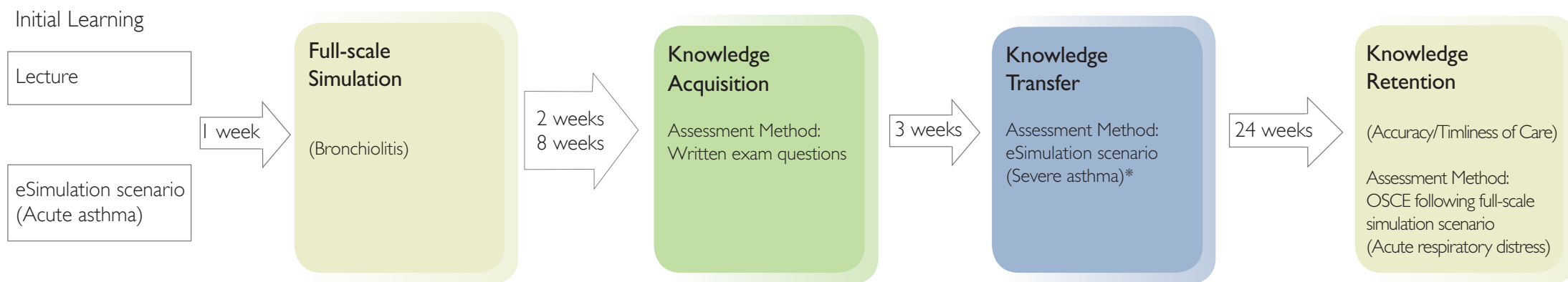
### 2 primary questions were asked

- 1 Are there differences in knowledge acquisition, knowledge transfer, knowledge retention and timeliness/accuracy of care decisions associated with instructional approach (Lecture vs eSimulation)?
- 2 Are there differences in learner receptivity associated with instructional approach (Lecture vs eSimulation)?



## Method

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\* Both groups had prior experience with eSimulation.

## Sample Sizes

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### 1 Lecture versus eSimulation

#### Knowledge Acquisition

Scores available from 76 students:  
38 students in Lecture Group  
38 in eSimulation Group

#### Knowledge Transfer

Scores available from 76 students:  
38 students in Lecture Group  
38 in eSimulation Group

#### Knowledge Retention

Scores available from 40 students:  
22 students in Lecture Group  
18 in eSimulation Group

### 2 Receptivity to learning with eSimulation

#### Survey

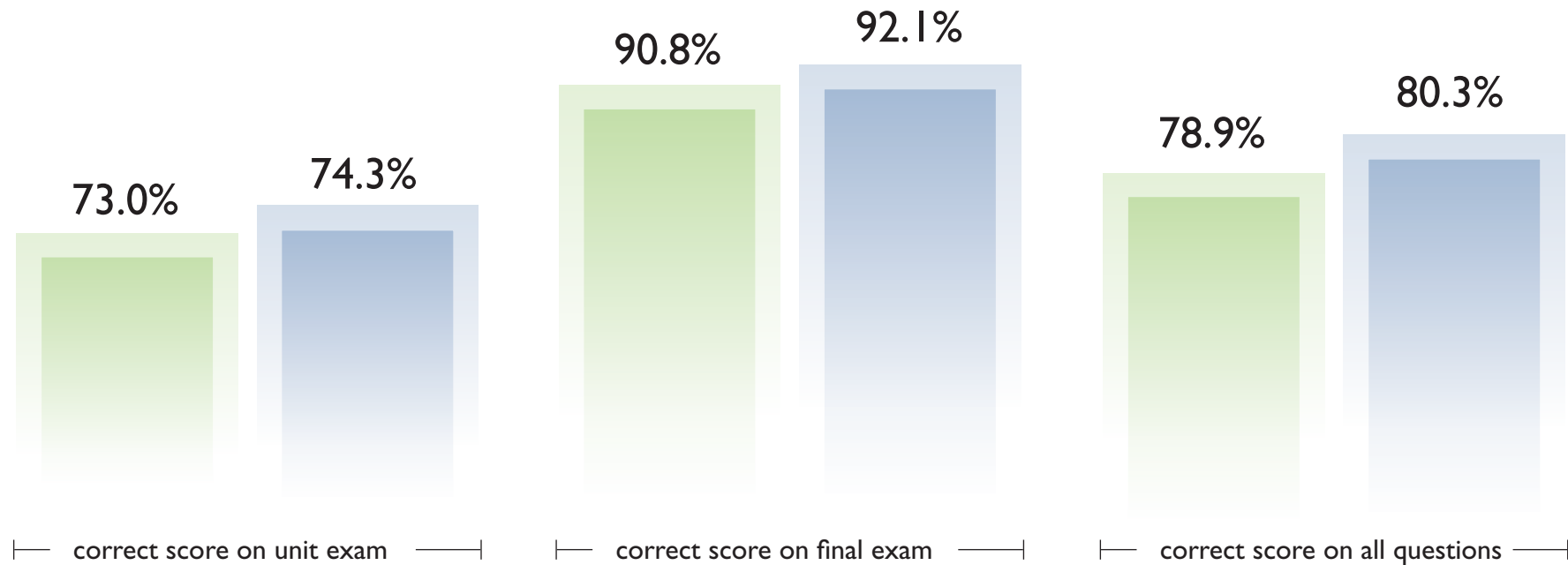
Scores available from 49 students:  
26 students in Lecture Group  
23 in eSimulation Group

## Results

### Knowledge Acquisition

Written Exam Scores showing eSimulation was equally effective as was lecture.<sup>1</sup>

■ Lecture Group  
■ eSimulation Group

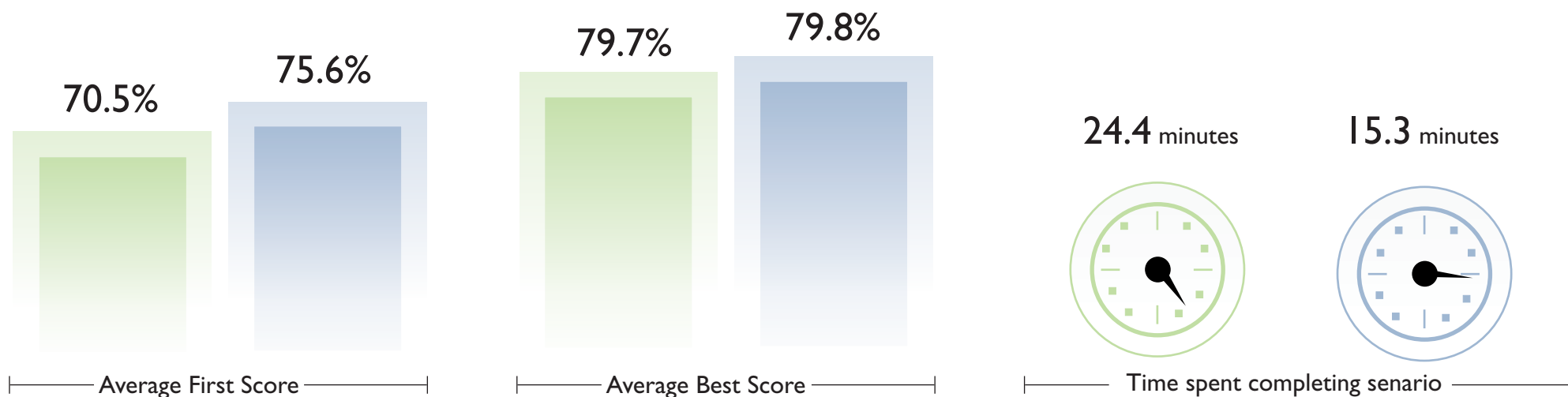


## Results

### Knowledge Transfer

First attempt scores on the 2nd Computer Based Scenario showing the eSimulation group had better scores on the eSimulation scenarios on Severe Asthma than did Lecture group. Lecture group achieved best scores equivalent to the eSimulation group on the same scenario but required longer engagement with the eSimulation scenario.<sup>1</sup>

■ Lecture Group  
■ eSimulation Group

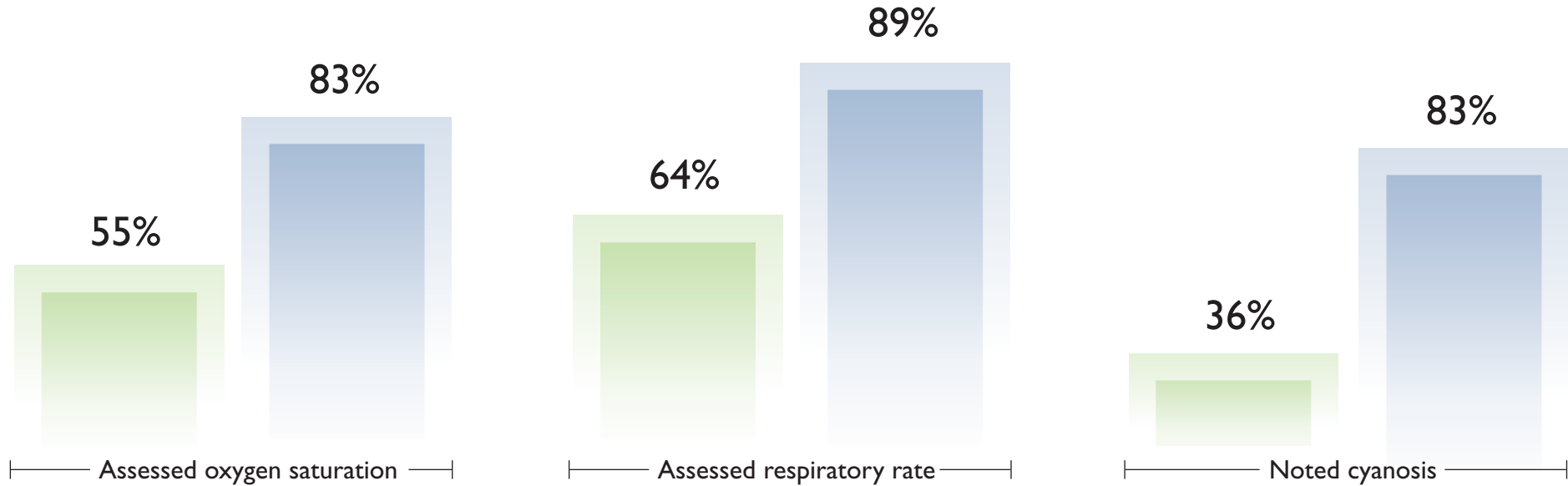


## Results

### Knowledge Retention

Performance on the OSCE entailing assessment and care of an infant (SimBaby) in respiratory distress showing the eSimulation group had significantly better retention on 3 key assessment actions.<sup>2</sup>

■ Lecture Group  
■ eSimulation Group



## Results

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### Receptivity to Learning

- All students were receptive to eSimulation.<sup>1</sup>
- Lecture group reported higher agreement that eSimulation strengthened understanding.<sup>1</sup>
- Both groups agreed eSimulation challenged their ability to think.<sup>1</sup>

## Conclusions

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- Students learning concepts and principles of airway management via eSimulation outperformed those who learned via lecture.<sup>3</sup>
- The results suggest that systematic implementation of eSimulation for other care concepts should be evaluated as eSimulation may help graduates improve their readiness for practice.<sup>3</sup>

## Vocabulary

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- Knowledge Acquisition: gaining knowledge
- Knowledge Transfer: applying gained knowledge to new situations
- Knowledge Retention: preservation of the after effects of experience and learning that makes recall or recognition possible. ([www.merriam-webster.com](http://www.merriam-webster.com))
- Decision Making Skills: accuracy and timeliness of care decisions (Cason, 2009)
- Learner Receptivity: Learner's ability or inclination to receive ([www.merriam-webster.com](http://www.merriam-webster.com))
- Cyanosis: bluish or purplish discoloration of skin due to deficient oxygenation of blood. ([www.merriam-webster.com](http://www.merriam-webster.com))
- OSCE: Objective Structured Clinical Examination (<http://www.wikipedia.org/>)

## References

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- 1. Improving learning of airway management with case-based computer microsimulations** (*Clinical Simulation in Nursing, 2010*).  
Carolyn L. Cason, RN, PhD, Mary A. Cazzell, RN, BSN, Kristine A Nelson, RN, MN, Victoria Hartman, RN, NSN, CPNP, Jennifer Roye, RN, MSN, CPCP, Mary E. Mancini, RN, PhD, FAAN
- 2. Learning the principles and concepts of airway management: The efficacy of replacing lecture with eSimulation™** (*Final report, November 2008*).  
Project Team: Carolyn L. Cason, RN, PhD, Professor and Associate Dean for Research, Principal Investigator; Kristine A. Nelson, RN, MN, Lead Teacher Undergraduate Pediatric Nursing Course, Project Coordinator; Victoria L. Hartman, RN, MSN, CPCP, Faculty, Undergraduate Pediatric Nursing Course, Co-Investigator; Jennifer Roye, RN, MSN, CPNP, Faculty, Undergraduate Pediatric Nursing Course, Co-Investigator; Mary E. Mancini, RN, PhD, FAAN, Professor and Associate Dean Undergraduate Program, Co-Investigator; and Mary Cazzell, RN, BSN, Graduate Research Assistant. University of Texas at Arlington, Arlington, TX, United States.
- 3. Using eSimulation to enhance student nurses' clinical skills** [Abstract] (*Society for Simulation in Healthcare, 2010*).  
Carolyn L. Cason, RN, PhD, Mary A. Cazzell, RN, BSN, Kristine A Nelson, RN, MN, Victoria Hartman, RN, NSN, CPNP, Jennifer Roye, RN, MSN, CPCP, Mary E. Mancini, RN, PhD, FAAN
- 4. Improving learning and performance with case-based computer simulations: eSimulation™** [Poster] (*International Nursing Simulation/Learning Resource Centers Conference, 2009*).  
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Carolyn Cason is Professor and Associate Dean for Research, School of Nursing, The University of Texas at Arlington. She teaches in the PhD in Nursing program and serves as Administrator of the Smart Hospital™, a Laerdal Center of Educational Excellence, a Hill-Rom, Inc National Demonstration Showcase, and the CareFusion Nursing Discovery Center.

Recommended links:

[The University of Texas at Arlington, School of Nursing's Smart Hospital](#)



## Product Information

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### eSimulation

#### Self-directed learning system

For this study the eSimulation application used was MicroSim InHospital by Laerdal Medical. eSimulation Inhospital is designed for use by all healthcare students and professionals, especially for physicians, nurses, physician assistants, and medical residents.

#### eSimulation Inhospital Modules:

- Airway & Breathing
- Chest Pain
- Cardiac Arrest 1
- Cardiac Arrest 2
- Cardiac Arrhythmia 1 (Tachydia)
- Cardiac Arrhythmia 2 (Bradycardia)
- Metabolic & Environmental Emergencies
- Poisoning & Overdose

\*Each module has 5 patient cases.

