Integrating Simulation into Nursing Curriculum

Helen K. Burns PhD, RN, FAAN
Associate Dean for Clinical Education
University of Pittsburgh School of Nursing

December 4, 2008
First: What do you **mean** ‘Simulation’?
Definitions

“Simulator”
- Refers to a *device* that presents a simulated patient (or part of a patient) and interacts appropriately with the actions taken by the simulation participant.

“Simulation”
- Refers to applications of simulators for education or training i.e., teaching knowledge and skills.

Cooper & Taueti. (2004)
Advantages for Nursing Simulation

- The clinical setting can be realistically simulated. Hands-on experience with rare events/high risk patient situations.
- Guaranteed exposure (practice of cognitive & psychomotor skills) to clinical experiences which are difficult to obtain. Safe for patient and provider.
- Consistent and comparable experiences can occur for all students.
- Active learning can occur – developing and establishing benchmarks for performance, which can be measured in the simulated environment and potentially transferred to patient care.
- Errors can be corrected and discussed immediately.
- Opportunity for self-reflection and assessment (debriefing) absent in the clinical setting because of practicality.
In addition....

- Communication
- Teamwork
- Delegation....can be simulated

- Simulation appeals to technology savvy students.
- Students immersed in technology from an early age (digital natives) – learn very differently.
Yet.....barriers

Infusing simulation into nursing curriculum can be a daunting task

- Faculty buy-in and adoption of simulation:
  - time to learn to use technology
  - lack of time to create
  - lack of faculty compensation for learning
Factors contributing to slow adoption:

- Technology fatigue (new technology appears almost monthly in both clinical and education settings).
- Fear of technology (among faculty is well documented across academic settings).
- Expanse of purchasing and maintaining simulators.
However......

The best outcomes with simulation occur when it is integrated across a curriculum.

Goal: How to embed simulation into, rather than on top of, already crowded curriculum agendas.

Gaba, 2004
Jeffries, 2005
And......

• Each nursing faculty group needs a champion.
• Although simulated models are present in many nursing programs, failure to maximize the use of this equipment wastes available resources and a valuable opportunity for innovative teaching.
• Projects must start small – avoid skipping essential phases.
Curricular Integration

- Curriculum Mapping
  - Cross referenced with recognized standards, attributes, criteria.
  - Embed simulation throughout a curriculum where appropriate, instead of viewing simulation exercises as independent pieces.
  - Each successive simulation experience builds on preceding ones.

O’Donnell & Goode, 2008
## Outcome Matrix

<table>
<thead>
<tr>
<th>Provost (Key Attributes)</th>
<th>BSN Essentials (Core Competencies)</th>
<th>NCLEX (Test Plan)</th>
<th>Institute of Medicine [IOM] (Core Competencies)</th>
<th>Quality and Safety Education for Nurses [QSEN] (Competencies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Skills (written/oral)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Critical thinking, Evidence-Based Practice &amp; Nursing Process</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Quantitative Skill, Assessment &amp; Quality Improvement</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Technical Skills</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Health Promotion, Risk Reduction &amp; Disease Prevention</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Illness and Disease Management &amp; Patient Centered Care</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Information and Patient/Health Care Technologies</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Ethics</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Diversity</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Health Care</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Systems, Policy &amp; Regulatory Environments</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Caring-Collaboration &amp; Interdisciplinary Teams</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Teaching-Learning</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Professionalism &amp; Professional Values</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Curricular Development

• **Vertical**
  - **Novice** (assess, identify & report to instructor; intervene with direct assistance and supervision)
  - **Clinically Experienced** (complete these tasks more rapidly and independently; coordination of other team members)
  - **Expert** (Autonomously manage the situation and interact with other team members)

• **Horizontal**
  - **Interprofessional** and multi-disciplinary approach
  - Emphasis communication, cooperation, and teamwork

O’Donnell & Goode, 2008
Theoretical Frameworks

✓ Diffusion of Innovations Theory (Rogers, 2003)
  • Knowledge
  • Persuasion
  • Decision
  • Implementation
  • Confirmation

✓ Benner’s Model of Novice to Expert (1984)

✓ Kolb’s Theory of Experiential Learning (1984)
Driving the Process for Instruction

✓ Determine the content.
✓ Determine the learning objectives.
✓ Replicate reality as closely as possible.
✓ Use video equipment to record the activities.
✓ Conduct a debriefing conference session.
<table>
<thead>
<tr>
<th>Level (AY 08/09)</th>
<th># Students</th>
<th>*Modules/student</th>
<th>*Hours/Student</th>
<th>Cumulative Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>150</td>
<td>2</td>
<td>3</td>
<td>450</td>
</tr>
<tr>
<td>Sophomore</td>
<td>152</td>
<td>1</td>
<td>4</td>
<td>608</td>
</tr>
<tr>
<td>Junior</td>
<td>114</td>
<td>3</td>
<td>24</td>
<td>2736</td>
</tr>
<tr>
<td>Senior</td>
<td>101</td>
<td>1</td>
<td>32</td>
<td>3232</td>
</tr>
<tr>
<td>Senior elective</td>
<td>20</td>
<td>2</td>
<td>16</td>
<td>320</td>
</tr>
<tr>
<td>Accelerated 2nd degree</td>
<td>20</td>
<td>2</td>
<td>40</td>
<td>800</td>
</tr>
<tr>
<td>Fast-Track-Back</td>
<td>12</td>
<td>2</td>
<td>8</td>
<td>96</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>110</td>
<td>10</td>
<td>56</td>
<td>6160</td>
</tr>
<tr>
<td>NP Programs</td>
<td>60</td>
<td>2</td>
<td>16</td>
<td>960</td>
</tr>
<tr>
<td>Independent Study (all levels)</td>
<td>10</td>
<td>4</td>
<td>32</td>
<td>320</td>
</tr>
</tbody>
</table>

* Mean values

Total: 689 * 63 = 15682
Dimensions of simulation applications (Gaba, 2004)

- Simulation is a technique – not a technology – to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive manner.

- Simulation has a multitude of applications that can be categorized by 11 dimensions.
Dimension 1: The purpose and aims of the simulation activity

- Education
  - Emphasizes conceptual knowledge
  - Basic skills
  - Introduction to the actual work
- Training
- Performance assessment and competency
- Clinical rehearsals - adjuncts to clinical practice
Dimension 2: The unit of participation in the simulation

- Applications targeted at individuals – useful for teaching knowledge and skills.
- Team training:
  - “single discipline teams” (multiple individuals from a single discipline)
  - “multidisciplinary teams” (multiple disciplines together)
Dimension 3: The experience level of simulation participants

“Cradle to Grave” concept fosters long-term synergism

- [Early Learners – School children; Lay Public—facilitate bioscience education, career interest]
- College; University
- Initial Professional Education
- Residency or on-the-job training
- Continuing Education and Training
Dimension 4: The health care domain in which the simulation is applied

*Apply across nearly all health care domains*

- Imaging – radiology, pathology
- Primary care; psychiatry
- In-hospital ward based – medicine, pediatrics
- Procedural – surgery, OB/GYN
- Dynamic high hazard – OR, ICU, ED
Dimension 5: The health care disciplines of personnel participating in the simulation

Applicable to all health care disciplines

- Aides, clerks
- Allied health; technicians
- Nurses (including advanced practice)
- Physicians
- Managers; executives; trustees
Dimension 6: The type of knowledge, skill, attitudes, or behavior addressed in simulation

Support lifelong learning

- Conceptual understanding - “knows”
- Technical skills - “knows how,” “shows how,” “does”
- Decision making skills – meta-cognition, static and dynamic
- Attitudes and behaviors – teamwork, professionalism
Dimension 7: The age of the patient being simulated

Use across the lifespan

- Neonate
- Infant
- Children; teen
- Adults
- Elderly
Dimension 8: The technology applicable or required for simulations

- Verbal role playing
- Standardized patients (actor)
- Part-task trainer – physical, virtual reality
- Computer patient – “virtual world”
- Electronic patient – full virtual reality
Dimension 9: The site of simulation participation

- Home or office using multimedia screens
- School or library using multimedia screen
- Dedicated laboratory using part task trainers, virtual reality
- Replica clinical environment
- Actual work unit “insitu” simulation - mobile
Dimension 10: The extent of direct participation in simulation

- Remote viewing only (no interaction)
- Remote viewing with verbal interaction
- Remote viewing with hands-on interaction
- Direct on-site hands-on participation
- Immersive participation
Dimension 11: The feedback method accompanying simulation

- None
- Automatic critique by instructor (real time/delayed)
- Instructor critique
- Real time critique (pause/restart)
- Detailed post-simulation debriefing with audio-video recordings
“take-home points”

• [Nursing] educators must respond to the ethical messages, policy directives, and practical challenges raised by the emerging patient safety movement.

• New curricula are needed to train providers more safely, integrate a culture of safety, and better assess actual applied knowledge and skills.

• Simulation technology and pedagogy have advanced dramatically in recent years, and have the potential to improve [nurses] health professionals’ competency and safe practice.
Simulation Education in Nursing

- Ethically appealing
- Building blocks of evaluation data are accumulating
- Educational content can be designed for specific learning needs
- Does not replace clinical hands-on
Reference


SEGUE: Simulation Efforts in Graduate and Undergraduate Education

- Emphasizes development of an integrated and interdisciplinary HFHS curriculum.
- ~ 1000 students at the University of Pittsburgh School of Nursing
- All levels: Bachelor to Doctorate
- Model curricular integration for the US