Interdisciplinary Mobile Simulation within the UVM Health Network

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DISCLOSURES
Rural Health Disparities

- Lower life expectancies (3-5 years)
- Higher mortality: age-adjusted death rate 20% higher
- 92% higher likelihood of severe maternal morbidity
- 6-20% higher rate of infant mortality
- Healthcare workforce shortages:
  - < 8% of physicians practice in rural areas
  - 6.1 v 13.7 OB-GYN/100,000 population
**Figure 1. Age-adjusted death rates, by urban-rural classification: United States, 1999–2019**

- **Rural**: Significant decreasing trend from 1999 through 2010; stable trend from 2010 through 2019 ($p < 0.05$).
- **Urban**: Significant decreasing trend from 1999 through 2010, with different rates of change over time ($p < 0.05$).

**NOTES:** Urbanicity of county of residence is based on the 2013 NCHS Urban-Rural Classification Scheme for Counties; see Data source and methods. Access data table for Figure 1 at: [https://www.cdc.gov/nchs/data/databriefs/db417-tables.pdf#1](https://www.cdc.gov/nchs/data/databriefs/db417-tables.pdf#1).

**SOURCE:** National Center for Health Statistics, National Vital Statistics System, Mortality.
Rural Education Barriers

• Need for increased continuing education
• Lack of funding
• Lack of staffing
• Lack of local educational opportunities
• Lack of institutional support
Simulation Education

- Participant Knowledge
- Procedural skills
- Teamwork and communication
- Adverse events
- Patient outcomes
Early resuscitation saves lives

- Decreased ICU, inpatient LOS
- Decreased health care dollars
• EM Attendings
• EM RNs
• EM Residents
• LCOM Medical Students
• EMS
• CC-Pulm
• OB-GYN
• Respiratory Therapy
Purpose

- Curriculum of In-Situ High Acuity Low Occurrence (HALO) Events
- Enhance teamwork and communication
- Identify barriers to care
- Improve patient care delivery
• Develop interprofessional ED-based HALO scenarios
• Pilot in-situ simulation at Elizabethtown Community Hospitals
• Demonstrate the effectiveness of sim interventions
• Evaluate and optimize educational curriculum
• …
Design and implementation

Needs Assessment

Educational Objectives

Procedural Sim

Case-based Sim
Participant assessment

- Pre- and post- simulation assessment
- Standardized debriefing
- Standardized patient Methodology
- Procedural competency assessment
Curriculum Evaluation

• Qualitative and Quantitative assessment
• Incentivize learners
• Modify curriculum based on learner feedback
• Funding:
  • LCOM Frymoyer Scholars Program
  • UVMHN Safety Value grant

• Hardware
• Salary Support
• Transportation costs
Design and implementation

- Needs Assessment
- Educational Objectives
  - Procedural Sim
  - Case-based Sim
Please rank your confidence with the following procedures (within the scope of your professional responsibilities) on a scale of 1-5.

1 is not very confident, and 5 is very confident—can perform with ease.
<table>
<thead>
<tr>
<th>Procedure</th>
<th>Average RN Competency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cricothyrotomy</td>
<td>1.8</td>
</tr>
<tr>
<td>Neonatal resuscitation</td>
<td>1.9</td>
</tr>
<tr>
<td>Obstetric complications</td>
<td>2.1</td>
</tr>
<tr>
<td>Precipitous delivery</td>
<td>2.1</td>
</tr>
<tr>
<td>Ventilator management and trouble-shooting</td>
<td>2.6</td>
</tr>
<tr>
<td>Chest tube troubleshooting</td>
<td>2.8</td>
</tr>
<tr>
<td>Chest tube placement</td>
<td>2.8</td>
</tr>
<tr>
<td>Central line</td>
<td>3.1</td>
</tr>
<tr>
<td>Pleur-evac set up</td>
<td>3.2</td>
</tr>
<tr>
<td>Procedural sedation</td>
<td>4.1</td>
</tr>
</tbody>
</table>

n = 19
The bar chart shows the average physician competency for various medical procedures. The procedures listed, along with their average competencies, are:

- Neonatal resuscitation: 2.9
- Obstetric complications: 2.9
- Precipitous delivery: 3.1
- Ventilator management and trouble-shooting: 3.3
- Cricothyrotomy: 3.7
- Pleur-evac set up: 3.8
- Chest tube troubleshooting: 3.9
- Chest tube placement: 4.5
- Procedural sedation: 4.6
- Central line: 4.8

The sample size for this assessment is n = 19.
Design and implementation

Needs Assessment

Educational Objectives

Procedural Sim

Case-based Sim
• 2 pediatric intubation attempts

• 1.5 successful pediatric intubations
25% pre-intervention

62.5% post-intervention
• In situ mobile SIM starting in June

• Improved delivery of care to our most ill and vulnerable patients

• Network-wide standardized evidence-based approach to interprofessional education

• Proof of feasibility and efficacy -> ongoing sustainability

• Establish UVMHN as an innovative model for rural health education and equity