Innovative Critical Care Practice Model

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Objectives

• Recognize health-system impact of critical care practice (Pharmacists)

• Describe the critical care practice model transition (Pharmacists)

• Review global care needs for critical care patients (Pharmacy Technicians)
The presenter has no disclosures to report.
Health System Drivers

• Preventive medicine, ambulatory services
• Performance based incentives
• Resource sustainability, reduction
• Financial stewardship

• *Where is your inpatient population?*
Trends in US Hospitals

• Between 2009-2014
  — 109 fewer hospitals (5,795 to 5,686)
  — 29,764 bed number decrease

• Between 2006-2010
  — ICU beds increased 15% (67,579 to 77,809)

• Between 1980-2006
  — No change in number ICU pharmacists
# Education and Training Trends

<table>
<thead>
<tr>
<th>Post Graduation Plans</th>
<th>2010</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students pursuing hospital employment</td>
<td>22.1% (n=2067)</td>
<td>24.5% (n=3510)</td>
</tr>
<tr>
<td>Student pursuing residency</td>
<td>27% (n=1708)</td>
<td>26% (n=2729)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PGY2 Critical Care</th>
<th>2011</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programs</td>
<td>79</td>
<td>116</td>
</tr>
<tr>
<td>Positions</td>
<td>103</td>
<td>156</td>
</tr>
</tbody>
</table>

AACP 2010 and 2015 National Summary Report [www.aacp.org](http://www.aacp.org)

Critical Care Pharmacists Outcomes

• Infectious Diseases
  – Nosocomial pneumonia
    – Pharmacist-managed aminoglycoside PK dosing effective (multiple doses daily)
  – Medicare patients with HAI, CAI, and sepsis
    – Decreased LOS, mortality, AND total Medicare billing

• Thromboembolic Events
  – Medicare patients
    – Decreased mortality, LOS, Medicare charges, drug charges

Critical Care Pharmacists Outcomes
Mechanical Ventilation

• Sedation protocol adherence
  — Reduced mechanical ventilation days, ICU LOS, total LOS

• Tele-ICU pharmacists
  — Increased daily sedative interruptions

Critical Care Pharmacists Outcomes

• Participation on rounds, chart review
  — 66% reduction in prescribing errors
  — Up to $280,000 cost avoidance related to ADEs

• Pharmacist-initiated consultations
  — 15-bed med/surg ICU
  — $86,000 annualized cost savings*

*USD adjusted for inflation

Are our Critical Care services aligned…

with our patients?
with our physician and nurse colleagues?
with our department goals?
with our organization mission?
Cleveland Clinic Non-Cardiac ICU

Current Model

- Patient centered, Clinical Specialists & Generalists: clinical & distributive roles
- Clinical Specialists
  - M-F AM, ~ weekend centralized coverage
- Day
  - Rounding
  - Decentralized and centralized order verification (OV)
  - Indirect patient care
  - Academic
- Evening
  - Centralized (OV)
  - Varying Critical Care experience and training

![Chart showing Pharmacist to Bed Ratio](image)

- SICU: 1:20
- NICU: 1:16
- MICU: 1:15
- ICU: 1:129

...plus 70 beds
Neurology Neuro Stepdown
## 2015 ICU Data

<table>
<thead>
<tr>
<th></th>
<th>MICU</th>
<th>NeuroICU</th>
<th>SICU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ICU Readmission Rate (&lt;48h)</strong></td>
<td>1.4%</td>
<td>1.2%</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>ICU LOS</strong></td>
<td>6.3</td>
<td>5.6</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Total LOS</strong></td>
<td>14.5</td>
<td>13.2</td>
<td>16.3</td>
</tr>
<tr>
<td><strong>ICU Direct Cost/Day</strong></td>
<td>$2,778</td>
<td>$4,026</td>
<td>$5,242</td>
</tr>
<tr>
<td><strong>Total Direct Cost/Day</strong></td>
<td>$2,230</td>
<td>$2,904</td>
<td>$3,040</td>
</tr>
<tr>
<td><strong>Occupancy</strong></td>
<td>97%</td>
<td>91%</td>
<td>88%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shift</th>
<th>Annual Admissions (daily average)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MICU</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt;</td>
<td>997 (2.7)</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt;</td>
<td>1817 (5)</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>1170 (3.2)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3984 (10.9)</td>
</tr>
</tbody>
</table>
2015 Non-Cardiac ICU Medication Orders
# Drug Cost Through December 2015

<table>
<thead>
<tr>
<th>Top Drug Cost (except when noted)</th>
<th>2014 YTD Total Cost (% of Total)</th>
<th>2015 YTD Total Cost (% of Total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICU</td>
<td>$2,997,895 (15)</td>
<td>$3,695,031 (16)</td>
</tr>
<tr>
<td>NICU</td>
<td>$1,139,080 (6)</td>
<td>$1,449,064 (6)</td>
</tr>
<tr>
<td>SICU</td>
<td>$2,660,990 (14)</td>
<td>$2,647,270 (12)</td>
</tr>
<tr>
<td>TOTAL ICU Drug Cost</td>
<td>$19,510,635</td>
<td>$22,592,935</td>
</tr>
</tbody>
</table>
## SCCM White Paper
### Critical Care Pharmacy Services

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Optimal** | • Fundamental + Desirable +  
               • Integrated, specialized, dedicated model  
               • Highest level of teaching, research, practice |
| **Desirable** | • Fundamental +  
              • Specialized, Specific pharmacotherapy services |
| **Fundamental** | • Vital to safe provision of care |
Cleveland Clinic Non-Cardiac ICU

New Model

- Patient centered, Clinical Specialists & Generalists: clinical & distributive roles
- Clinical Specialists
  - Bedside AM 7 days/week
- Day, Evening, Weekend
  - Rounding
  - Decentralized and centralized order verification (OV)
  - Indirect patient care
  - Academic
  - Advance Critical Care training and experience

Pharmacist to Bed Ratio (Day, Monday-Friday)

- SICU: 1:20
- NICU: 1:16
- MICU: 1:15

Pharmacist to Bed Ratio (Evening/Weekend)

- NICU / SICU: 1:54
- MICU: 1:75
## Practice Expansion
### FTE Reallocation

<table>
<thead>
<tr>
<th>Department</th>
<th>Current FTE</th>
<th>Future FTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICU</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>NICU</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>NICU/SICU</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SICU</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>MICU PM</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>NICU/SICU PM</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>Float</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Offline</td>
<td>0</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9</strong></td>
<td><strong>14.1</strong></td>
</tr>
</tbody>
</table>

5 New FTEs??!!
- Internal Medicine
- Offline time
- ICU Satellite
Assessments

• Clinical interventions
• Reported medication events
• Disease state specific outcomes
• Cost evaluation
• Critical Care pharmacist activities → Fundamental, Desirable, Optimal
• Physician, Nurse, Pharmacist satisfaction
• Share the patient story
Opportunities

• One Cleveland Clinic
  — ICU standards for Model of Care

• Enterprise Critical Care Pharmacy Collaborative
Lessons Learned

• “Why?”
• Get comfortable
• Feedback is crucial, understand what it means
• Identify early champions
• Post-implementation assessment
Theodore Roosevelt

Excerpt from “Citizenship in a Republic” delivered at the Sorbonne in Paris, France on April 23, 1910
Innovative Critical Care Practice Model

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Every life deserves world class care.