Perinatal Regionalization: What Can States Do?

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U.S. Trends in Neonatal Mortality: Advances in Intensive Care

*NMR=neonatal mortality rate: # deaths to infants <28 days/1,000 live births
Does Perinatal Regionalization Still Influence Outcomes?

VLBW Mortality is Lower for Infants Born in a Level 3 Center

- Shown in multiple studies since 2004 including
  - US
    - California, New York, Missouri, South Carolina, Missouri
  - Sweden – national registry
  - Finland – national registry
  - France - EPIPAGE
VLBW Morbidity is **Higher** for Infants Born in a non-Level 3 Center

848 infants 500-1499 g in Cincinnati region

<table>
<thead>
<tr>
<th></th>
<th>Risk adjusted</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death/major morbidity</td>
<td></td>
<td>2.64</td>
<td>1.70-4.17</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td>1.87</td>
<td>1.02-3.45</td>
</tr>
<tr>
<td>BPD or death</td>
<td></td>
<td>2.55</td>
<td>1.58-4.13</td>
</tr>
<tr>
<td>ICH or death</td>
<td></td>
<td>2.96</td>
<td>1.80-4.90</td>
</tr>
<tr>
<td>ROP or death</td>
<td></td>
<td>2.63</td>
<td>1.47-4.74</td>
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</tbody>
</table>

1995-97 births

Warner et al Pediatrics 2004; 113:35-41

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VLBW Mortality is **Higher** at Lower Level 3 Volumes


<table>
<thead>
<tr>
<th>Level and Volume</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 3B or 3C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 25</td>
<td>1.51</td>
<td>1.17-1.95</td>
</tr>
<tr>
<td>26-50</td>
<td>1.30</td>
<td>1.12-1.50</td>
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<tr>
<td>Level 3B, 3C, or 3D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51-100</td>
<td>1.19</td>
<td>1.04-1.37</td>
</tr>
<tr>
<td>&gt;100</td>
<td>1.00</td>
<td>Ref</td>
</tr>
</tbody>
</table>

*Phibbs NEJM 2007:356:2165

3B – vent; 3C + surgery; 3D + cardiac surgery and ECMO

* Risk of death greater with delivery at hospitals with lower volume (or level) NICUs compared to those treating at least 100 VLBWs/yr
VLBW Mortality is **Higher** in Small NICUs

**Lower Saxony, Germany**

- Small delivery, small NICU: 1.94 (1.2-3.1)
- Large delivery, small NICU: 1.75 (1.1-2.8)
- Small delivery, large NICU: 1.16 (0.8-1.6)

- Small delivery service = < 1,000 births per year
- Small NICU = < 36 VLBW admissions per year
- Reference = large delivery, large NICU

Bartels DB Pediatrics 2006; 117:2206-14

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**VLBW Disparities in Level of Care**

- Vital statistics records of VLBW infants in New York City, 1996-2001
- Risk adjusted neonatal mortality rates in 45 hospitals ranged from 9.6 to 27.2 per 1000 births
- Mortality lower in high-volume hospitals (>200 VLBW births/yr)
- Black VLBW infants more likely than white to be born in high mortality hospitals (21 vs. 11%) – explained about 1/3 of disparity

HRSA/MCHB
National Performance Measure #17

- Percent of VLBW (<1500 gram) infants delivered at facilities for high risk deliveries and neonates

  Measurement:
  \[
  \text{# of <1,500 gram infants born at Level III facilities} \times 100 \\
  \text{Total # of <1,500 gram infants}
  \]

- Healthy People 2010 Objective 16-8
  - Goal 90%

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HRSA/MCHB Performance Measure #17: Percent of VLBW Infants Delivered at Facilities for High Risk Deliveries and Neonates by State*

*2007 Prelim Data
AAP Committee on Fetus and Newborn Policy Statement: Levels of Newborn Care

- Objective: To develop nationally applicable uniform definitions of levels of neonatal care based on the capability of facilities to provide increasing complexity of quality care

*Pediatrics* 2004; 114:1341-1347

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**Why Haven’t States Fully Adopted the 2004 AAP Guidelines?**

- **Level of Enforcement of Policy**
  - High intensity enforcement
  - Low intensity enforcement

- **Recommendation Strength (Quality of evidence)**

* AAP Annual Leadership Conference, 2008
Meeting Goal

To examine the issues of access to appropriate facilities for high-risk deliveries and neonates, specifically very low birth weight infants

Agenda

- Interstate Variations in Levels of Care
  - Lillian Blackmon, MD, University of Maryland School of Medicine (retired)

- Summary of State Performance Measure #17
  - Victoria Freeman, UNC Sheps Center

- Overview of Birth Outcomes in New York State
  - Jeff Koshel, Health Consultant
Agenda (cont.)

- State Presentations on Issues and Implications
  - AK, CA, CO, FL, KY, NY, TN

- Working Lunch/ Facilitated Discussion

- Wrap-up/Next Steps