Kentucky Perinatal Systems

Perinatal Regionalization Meeting
October 28, 2009
Infant mortality in Kentucky has been decreasing and is currently equal to the national average for states (ranked 26th).

Kentucky ranks in the bottom half of US states for nearly every other measurable indicator of perinatal health.

– The following slide is a summary for 12 indicators of perinatal health. (2005 data)
Origins of the KY Perinatal System

- Historically, KY had a Perinatal Advisory Committee for oversight of the initial regionalization efforts (1976–8)
  - KY Guidelines for Perinatal Care with 3 levels of care were developed and regularly updated;
  - University hospitals were designated as Level III centers and funded to care for uninsured neonates. Level II sites were selected for each Area Development District around the state
  - Sites were funded for start-up costs to buy equipment. Site visits done from State MCH office to assure compliance with guidelines.

- Transports were done by air national guard. University Level III centers developed neonatal transport services; Maternal transport services were recommended but never materialized.

- 1990’s in Ky saw improvements in
  - Teen pregnancy rates
  - Early and adequate prenatal care
  - Coverage for pregnant women and infants
  - Infant mortality much improved
Systems of Perinatal Care in KY

- When funding went away over time, the MCH program no longer did site visits, dropped the KY Guidelines for Perinatal Care and did not continue the Perinatal Advisory Committee.

- Language added into CON Application Standards:
  
  “An application for special care neonatal beds will be consistent with this plan if:
  
  The application documents consistency with the most recent published edition of the AAP and ACOG Guidelines for Perinatal Care.”

- No provision for accountability after the CON is awarded;
  - Levels of NICU’s not included in hospital licensure regulations;
  - JCAHO no longer addresses Special Care Units
History of (De-)Regionalization in Kentucky

**De-regionalization**

- More perinatal providers
  - Urban hospitals all developed NICU’s to compete for deliveries in their catchment area
  - Neonatologists hired in rural Level II’s
- Desire by patients to stay close to home
  - Depends on how the choice is presented to them
- Reimbursement vs. Expenditures
  - Neonatologists reimbursed more for babies <1500 gm
  - Babies < 1500gm occupy beds for longer, keeping ADC up and providing prolonged per diem for hospitals

Rural hospitals and less-equipped urban hospitals have been delivering care to smaller and sicker infants.
Regionalized Perinatal Care in KY

- State Health Plan revised yearly; in Jan 2006, made CON process less restrictive to improve access to neonatal care

- CON requirements for Level II NICU:
  - Level II NICU’s should preferably be 8 beds
  - Formula:
    \[
    \text{# births in ADD} \times \frac{4}{1000} = \text{cap for # Level II NICU beds in ADD}
    \]
  - Utilization of existing Level II beds in the ADD must exceed 70%
  - Applicant must document they would provide care consistent with most recent edition of “Guidelines for Perinatal Care” (AAP/ACOG)
  - Currently 217 Level II NICU beds licensed in KY (26 hospitals)
Regionalized Perinatal Care In KY

CON requirements for Level III NICU Beds:

– Formula:

\[
\text{# births in ADD} \times \frac{1}{1000} = \text{cap for # NICU Level III beds in ADD}
\]

– Utilization of existing Level III beds must exceed 75%

– Applicant must document they would provide care consistent with most recent edition of “Guidelines for Perinatal Care” (AAP/ACOG)

– Currently 117 Level III NICU beds licensed (5 hospitals)

*Very Low Birth weight is defined as any live birth weighing <1500 grams (3# 5 oz) at birth

**2007 & 2008 data is preliminary and numbers could change

^Note: Beginning in 2006, babies born only at a Level III hospital were included in the numerator


HK 2010 Goal: 90%
Definition for NPM #17

Numerator:
(before 2006) # of very low birth weight infants delivered at facilities for high risk deliveries and neonates

(after 2006) # infants with birth weight <1500 grams born at subspecialty facilities (Level III Facility)

[Does this mean Level III facility or a facility having a Level III NICU??]

Denominator: Total # of very low birth weight babies born in state to Kentucky residents
National Designations for Perinatal Levels of Care

“Distinction should be made between the perinatal care services level that characterizes an institution or hospital and the level of care provided within individual patient-care units of a hospital.” — GPC-6, p10
National Perinatal Levels of Care

“The former [level that characterizes an institution or hospital] applies to the total organization of perinatal health services and the responsibilities associated with participation in a coordinated regional system of care. The determination of the appropriate level of care to be provided by a given hospital should be guided by prevailing local health care regulations [e.g., CON], national professional organization guidelines, and identified regional perinatal health service needs.”

GPC-6, p10
“The latter [level of care provided within individual patient care units] is based on the individual needs of the perinatal patient, postpartum woman, and neonate. In the case of neonatal services, level of care should be assigned according to the classification system developed by the AAP and published in 2004.
2007 Perinatal Task Force:

(1) Design a **voluntary reporting system** for Level II and Level III nurseries, including the **identification of quality indicators and data to be collected**

(2) Analyze **best practices** from other states

(3) Identify strategies to **ensure compliance with national practice guidelines for perinatal care** in regard to appropriate facilities, equipment, 4) Make **recommendations** to the Department for Public Health regarding **the improvement of quality perinatal care** in Kentucky, and

(4) Make **recommendations** to the Department for Public Health regarding **the improvement of quality perinatal care** in Kentucky, and

(5) Analyze the policies of Level II Nurseries related to **transport to an appropriate tertiary care perinatal program**.
2007 Perinatal Task Force:

- University Perinatal Programs
- Kentucky Medical Assoc
- Kentucky Perinatal Assoc
- AWHONN
- KY Board of Nursing
- KY Hospital Association
- Ky Dept for Public Health
- Representation from rural and urban Level II’s
- Representation from non-university Level III’s
- Representative from Legislature
- Office of Health Policy (CON)
- Student from College of Public Health
Evidence Based Practices for Quality Neonatal Care

- Leapfrog EBHR Safety Standards for NICU (1992)
  - VLBW Infants (<1500gm, <32 weeks) are more likely to survive at hospitals with large NICU’s, defined as ADC >=15

- Phibbs et al, NEJM May 24, 2007
  - For VLBW infants (10yrs data) Mortality decreased as patient volume increased within each level of care, and with higher levels of care within each volume group. Mortality was lowest when VLBW deliveries occurred in Level III facilities with NICU’s that treat more than 100 VLBW annually.
  - Associations between mortality and NICU level and volume were greatest for the smallest infants, <1000g.
  - Model estimated that 21% of VLBW deaths were potentially preventable if those infants had been cared for in a high level, high volume NICU.
“Careful documentation of birth-weight specific mortality rates by hospital of birth has shown that the survival of premature, very low birth weight infants is highest when births occur in hospitals with larger neonatal intensive care units. This finding has been reported in the United States and other countries. Given the weight of the evidence, it must be emphasized that inpatient perinatal health care services should be organized within individual regions or service areas in such a manner that there is a concentration of care for the highest risk pregnant women and their fetuses and neonates in the highest level perinatal centers.”

P10

multiple reference articles listed, p 17-18
# National Perinatal Levels of Care

Levels of Perinatal Care by Hospital/Facility

<table>
<thead>
<tr>
<th>Level</th>
<th>Care Type</th>
</tr>
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<tbody>
<tr>
<td>Level I</td>
<td>Basic Care</td>
</tr>
<tr>
<td>Level II</td>
<td>Specialty Care</td>
</tr>
<tr>
<td>Level III</td>
<td>Sub-specialty Care</td>
</tr>
<tr>
<td>Regional Center</td>
<td>Level III + regional responsibilities</td>
</tr>
</tbody>
</table>

Detailed in GPC-6, Table 1-3
National Perinatal Levels of Care Model for KY Guidelines

Levels of Care by Neonatal Care Unit:

- Level I – Basic Care
- Level II – Specialty care
  - Level II A
  - Level II B
- Level III – Subspecialty Care
  - Level III A
  - Level III B
  - Level III C

p 13-14
National Guidelines for Perinatal Levels of Care

- **ALL LEVELS:**
  - Identify high risk perinatal patients and determine which should be transferred.
  - Capability for emergency C-section within 30 minutes.
  - Resuscitation and stabilization of neonates.
  - Consultation and transfer arrangements.
  - Data collection and storage.
  - Quality Improvement programs, including efforts to maximize patient safety.
  - Adequate support services.
National Guidelines for Perinatal Levels of Care

LEVEL I – BASIC CARE

Providers: OB, CNM, Ped, FP

“Level I Units provide a basic level of newborn care to infants at low risk. They can stabilize and care for late preterm infants (35-37 weeks) who remain physiologically stable; Stabilize infants who are less than 35 weeks gestation or who are ill until they can be transferred.” P. 10,22
**LEVEL II – SPECIALTY CARE**

- Board Certified Obstetricians, Pediatricians, sometimes Neonatologists
- “A level II nursery provides care for infants born at more than 32 weeks gestation and weighing more than 1500g who have physiologic immaturity, who are moderately ill with problems that are expected to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis, or who are convalescing.” P10, 22, Table 1-3

<table>
<thead>
<tr>
<th><strong>Level II A</strong></th>
<th><strong>Level II B</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not have the capability to provide assisted ventilation except on a limited basis until the infant can be transferred</td>
<td>Additional capacity to provide mechanical ventilation for brief duration (up to 24 hrs) or CPAP P13,20</td>
</tr>
</tbody>
</table>
Level II-B v.s. Level III-A

- **Level II-B**
  
  **GPC-6 (AAP 2004)**
  
  >32 weeks, >1500 gm, CPAP
  
  Conventional vent <24 hrs

  **Issues:**
  II-B's with neonatologist do conventional vent >24 hrs but still short term; most do not need subspecialists
  
  If can only do vent <24 hrs, unit will not be staffed by a neonatologist; most likely will be physician extenders with remote access to a physician/neo
  
  Even doing CPAP, any vent should require neonatologist
  
  Unlikely these units would participate in data collection (VON)
  
  Could a pediatrician run a II-B

- **Level III-A**
  
  **GPC-6 (AAP 2004)**
  
  >28 weeks, >1000gm, but only conventional vent

  **Issues:**
  
  Having a Neonatologist does not make you a Level III
  
  Few Level III's have all the "other stuff"
  
  "Other stuff" not clearly defined
  
  May not need subspecialties for limited ventilation & >1000 gm
  
  Do you need a perinatologist? On site?
  
  No clear distinction of staffing, services in A v.s. III-B and III-C – just buy equipment and they could do anything
  
  May or may not participate in data collection (VON)
LEVEL III – SUB-SPECIALTY CARE

- Full time MFM Specialists; Neonatologists; Pediatric Subspecialties
- In-house OB and anesthesia
- Neonatal Follow-Up Program “is an essential component” of subspecialty services
- Outreach education
- Advanced Quality Improvement and data analysis

<table>
<thead>
<tr>
<th>Level III A</th>
<th>Level III B</th>
<th>Level III C</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Provides comprehensive care for infants born at more than 28 weeks gestation and weighing more than 1000gm; - Conventional mechanical ventilation only</td>
<td>- additionally cares for infants &lt;28 week and &lt;1000 gm; - advanced respiratory support such as HFV;</td>
<td>- all Level III B, and can also provide ECMO and open heart surgery</td>
</tr>
</tbody>
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P 13-14, 24-25
Proposed 2008 Kentucky Guidelines for Perinatal Care

5 Levels of Care

- Level I: Basic neonatal care, >35 weeks
- Level IIA: Mildly ill neonates, >34 weeks, >1800 grams
- Level IIB: Moderately ill neonates, >28 weeks, >1250 gms, CPAP, mechanical ventilation (<7 days), conventional only; requires neonatologist
- Level III: Complex diseases, any gestational age or birth weight, protracted mechanical ventilation, advanced ventilation techniques; ECMO, ped surgery in some centers; requires neonatologist, perinatologist, ped subspecialties
- RPC: Level III clinical care, educational outreach, referral and consultation, specialized transport, developmental follow-up, interventional services
KY VLBW Mortality Level of Care

Linked Death-Birth files 2000-2005
(Exclusions: Infants Transferred In or Out)

KY IM by Level, Inborn

- Inborns < 1500 gm
- Inborns < 1250 gm
- Inborns < 1000 gm
- Inborns < 750 gm

* Data is raw data, not risk adjusted; differences are statistically significant. However, Number of cases is low, especially for Level I centers, and should be considered statistically unstable.
Infant Mortality by Level of Care and Experience in Kentucky

[Inborns only, non-transfer, unadjusted]
## Kentucky and Tennessee

<table>
<thead>
<tr>
<th></th>
<th>Kentucky</th>
<th>Tennessee</th>
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</thead>
<tbody>
<tr>
<td>Infant Mortality</td>
<td>6.8</td>
<td>8.7</td>
</tr>
<tr>
<td>Neonatal Mortality (&lt;28 days)</td>
<td>4.1</td>
<td>5.6</td>
</tr>
<tr>
<td>VLBW % births</td>
<td>1.6%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Black/White IM ratio</td>
<td>2.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Perinatal Mortality</td>
<td>8.2</td>
<td>10.3</td>
</tr>
</tbody>
</table>
KY Guidelines Not Adopted

- “That’s not my hospital’s data”
- Families want to stay close to home (it was the family’s decision)
- It’s the doctor’s call whether or not to transfer
- We don’t want more regulation
- National guidelines say we can “adapt” to local circumstances
- National guidelines change, so what I was doing before was OK, and now I am doing the same thing but it is not OK
NPM #17 – What are we Doing?

- Seeds of a Perinatal Quality Collaborative
  - Committee of Kentucky Perinatal Association
- VON- KY state group report for comparison of participating hospital to like KY hospitals
- Re-aligned university contracts to reflect GPC-6 perinatal center classification
- Possible new regulations
- FIMR – two pilot sites
- PRAMS
NPM # 17: What would be helpful?

- Uniform definition for this indicator
- Guidance on how to use this indicator with other measures to monitor “regionalization”
- More concrete national standards, especially description of differences in Levels and sub-levels, particularly which are essential for Level III A,B,C
- More specific definition of “24/7 coverage by neonatologist” (e.g. on site, in-house, nearby, via telemedicine???)