Use of Telemedicine in Perinatal Care

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Disclosure Statement

Dr. Sanjay Mitra

Financial — No relevant financial relationship exists.
Nonfinancial — Central Advisor Council Member for WV Perinatal Partnership: Receives no compensation as member of this council.

Cathy Richards, RN, EMT-P, MCCN

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Nonfinancial — No relevant nonfinancial relationship exists.

Christy Dixon, RRT, RN

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Objectives

* Health Care disparity in Perinatal Care
* Perinatal Care Status & Outcome in the state of West Virginia
* Review of the Golden Hour
* Technology in transport to overcome some of the barriers
Almost 21,000 babies are born in the state of West Virginia every year.

40% of live births occur in three statewide level III/IV care perinatal center.

73 % of the birthing centers in the state have less than 750 deliveries /year.

Almost 8 to 10 % of newborn infants in the state are admitted to level III/IV care NICU.
Definition

* Health disparities are preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations.

* Populations can be defined by factors such as race or ethnicity, gender, education or income, disability, geographic location (e.g., rural or urban), or sexual orientation.
Factors causing Health disparity

- Poverty
- Environmental threats
- Inadequate access to health care
- Individual and behavioral factors
- Educational inequalities
Number of Births in Counties with No Maternity Services in 2009
<table>
<thead>
<tr>
<th>Hospital</th>
<th># Births</th>
<th>Hospital</th>
<th># Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appalachian Regional</td>
<td>57</td>
<td>Princeton Community Hospital</td>
<td>697</td>
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<tr>
<td>Berkeley Medical Center</td>
<td>1,101</td>
<td>Raleigh General Hospital</td>
<td>1,275</td>
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<tr>
<td>Bluefield Regional</td>
<td>622</td>
<td>Reynolds Memorial Hospital</td>
<td>96</td>
</tr>
<tr>
<td>Cabell Huntington</td>
<td>2,733</td>
<td>Ruby Memorial Hospital</td>
<td>1,571</td>
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<tr>
<td>Camden Clark</td>
<td>1,707</td>
<td>St. Mary’s Hospital</td>
<td>398</td>
</tr>
<tr>
<td>CAMC</td>
<td>2,669</td>
<td>St. Joe’s (Buckhannon) Hospital</td>
<td>295</td>
</tr>
<tr>
<td>Davis Memorial</td>
<td>331</td>
<td>Stonewall Jackson Hospital</td>
<td>314</td>
</tr>
<tr>
<td>Fairmont General</td>
<td>419</td>
<td>Summersville Regional Med. Ctr</td>
<td>316</td>
</tr>
<tr>
<td>Garrett County Memorial</td>
<td>280</td>
<td>Thomas Memorial Hospital</td>
<td>1,085</td>
</tr>
<tr>
<td>Grant Memorial</td>
<td>263</td>
<td>United Hospital Center</td>
<td>986</td>
</tr>
<tr>
<td>Greenbrier Valley Medical Ctr</td>
<td>571</td>
<td>Weirton Medical Center</td>
<td>571</td>
</tr>
<tr>
<td>Jefferson Memorial</td>
<td>257</td>
<td>Welch Emergency Hospital</td>
<td>70</td>
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<tr>
<td>Logan Regional</td>
<td>332</td>
<td>Wheeling Hospital</td>
<td>1,275</td>
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<tr>
<td>Monongalia General</td>
<td>1,088</td>
<td>Williamson Memorial Hospital</td>
<td>100</td>
</tr>
<tr>
<td>Ohio Valley Medical Center</td>
<td>303</td>
<td>Woman Care</td>
<td>7</td>
</tr>
<tr>
<td>Pleasant Valley</td>
<td>146</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Maternal Health Provider Shortage Areas
Locations of Open and Closed Birth Facilities

- Locations of Level I and II obstetric services
- Locations of Level III Perinatal Referral Centers

Birth Facilities That Have Closed Since 1976

1. Morgan City War Memorial
2. Hampshire Memorial
3. Potomac Valley Hospital
4. Tucker County Hospital
5. Broaddus Hospital
6. Grafton City Hospital
7. Sistersville General Hospital
8. Memorial General Hospital, Elkins
9. Webster County Hospital?
10. Richwood Community Hospital?
11. Pocahontas Memorial Hospital
12. New River Birth Center
13. Appalachian Regional Hospital
14. Calhoun General Hospital
15. Putnam General Hospital
16. WVSOM Birth Center
17. Rainelle Medical Center Birth Center
18. Dr. Vincent’s Birth Center
20. Women’s Health Center Birth Center
21. Boone Memorial Hospital
22. Hinton Hospital
23. Summers County Hospital
24. Stevens Clinic
25. Doctors’ Memorial
26. Wyoming General Hospital
27. Montgomery General
28. Oak Hill Hospital
29. Guthrie Hospital
30. Lincoln County Clinic
31. Holden Hospital
32. Man Appalachian Regional
33. Wetzel County Hospital (closed 2006)
34. Roane General Hospital (closed 2009)
35. Preston Memorial Hospital (Closed 2011)
36. St. Josephs, Hospital Wood County merged with Camden Clark Memorial Hospital
37. Reynolds Memorial Hospital (2012)
Counties with no birth facilities and no prenatal care in their borders

WV Birth Facilities
WV Tertiary Perinatal Facilities
Countries with no prenatal and no birth facilities
Prenatal Care Shortage Areas delivering at Stonewall Jackson Level I

Braxton

Gilmore
Prenatal Care Shortage Areas delivering at Grant Memorial Level I

Hardy

Pendleton

WV Locations Where Hardy Women Gave Birth 2004-2009

- Grant Memorial Hospital
- WVU Hospitals, Inc.
- City Hospital
- Monongalia General Hospital
- Davis Memorial Hospital
- Stonewall Jackson Memorial Hospital
- United Hospital Center
- Wheeling Hospital
- WV Non-Hospital
- Maryland:
- Howard County General Hospital, Inc
- Memorial Hospital of Cumberland, Inc


- Grant Memorial Hospital
- Davis Memorial Hospital
- WVU Hospitals, Inc.
- St. Joseph’s Hospital (Elkins)
- Stonewall Jackson Memorial Hospital
- City Hospital
- WV Non-Hospital
Prenatal Care Shortage Areas delivering at Camden Clark Level I

Richie

Wirt


Prenatal Care Shortage Areas delivering at Camden Clark Level I

Calhoun

Pleasants
Prenatal Care Shortage Areas delivering at UHC Level I

Taylor

Status on Prenatal Care and Outcomes
The State of Perinatal Health in West Virginia 2006-2013

Low Birth Weight (<2,500 GMS) Among WV Residents

* 2006 9.8%
* 2011 9.6%
* 2012 9.2%
* 2013 (preliminary) 9.4%

Data Source: WV Health Statistics Center, Vital Statistics System
Teen Pregnancy in West Virginia

What goes wrong when teens have babies:

• **Dropping Out.** One in three girls cites pregnancy as her reason for dropping out of high school.

• **Poverty.** The poverty rate for kids born to teenage mothers who have never married and did not graduate from high school is 78%, compared to 9% of children born to married women over 20 who are high school graduates.

• **Unhealthy Babies.** Children born to teen mothers are at higher risk of being born under weight and dying within their first year of life. They are less likely to get the emotional and intellectual stimulation they need for healthy child development.

1 in 22
WV TEENAGE GIRLS WILL HAVE A BABY

1 in 8
WV BABIES IS BORN TO A TEEN MOTHER

What we can do:

• Implement the state’s comprehensive sex education curriculum
• Give young people a credible vision of a positive future
• Help parents succeed as sex educators
• Help adults provide good information about how to reduce risk-taking behaviors
• Create community-wide action plans for teen pregnancy prevention

Teen pregnancy rates have been dropping in WV and the nation. But in 2006, WV’s rates began to worsen, and the disparity between WV and the nation became much greater. The bar graph to the left shows each county and its rate of teen births age 15-19, per 1,000. The map is color-coded with the bars.
### Very Low and Low Birth Weight By Age of Mother, WV Residents

<table>
<thead>
<tr>
<th>Age Of Mother</th>
<th>2006 % Very Low and Low BW</th>
<th>2012 % Very Low and Low BW</th>
<th>2013* % Very Low and Low BW</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-14</td>
<td>18.2%</td>
<td>12.5%</td>
<td>9.5%</td>
</tr>
<tr>
<td>15-17</td>
<td>12.5%</td>
<td>12.0%</td>
<td>10.1%</td>
</tr>
<tr>
<td>18-19</td>
<td>11.3%</td>
<td>10.5%</td>
<td>11.3%</td>
</tr>
<tr>
<td>20-24</td>
<td>10.7%</td>
<td>9.0%</td>
<td>9.1%</td>
</tr>
<tr>
<td>25-29</td>
<td>8.9%</td>
<td>8.2%</td>
<td>8.9%</td>
</tr>
<tr>
<td>30-34</td>
<td>9.1%</td>
<td>9.0%</td>
<td>9.0%</td>
</tr>
<tr>
<td>35+</td>
<td>8.6%</td>
<td>11.2%</td>
<td>11.0%</td>
</tr>
</tbody>
</table>

*Preliminary Data

Data Source: WV Health Statistics Center, Vital Statistics System
Percentage of Very Low Birth Weight Infants (450-1499 gm) by Place of Birth, 2000-2009

Data Source: WV Health Statistics Center, Vital Statistics System
### WV Birth Outcome Rankings, 2013

<table>
<thead>
<tr>
<th>Birth Outcome</th>
<th>WV</th>
<th>U.S.</th>
<th>WV Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cesarean Delivery</td>
<td>35.9%</td>
<td>32.8%</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Preterm Births</td>
<td>12.4%</td>
<td>11.5%</td>
<td>13&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Low Birth Weight</td>
<td>9.2%</td>
<td>8.0%</td>
<td>7&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Very Low Birth Weight</td>
<td>1.5%</td>
<td>1.4%</td>
<td>18&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Teen Birth Rate</td>
<td>44.1 per 1,000</td>
<td>29.4 per 1,000</td>
<td>6&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*Data Source: National Center for Health Statistics*
Infant Mortality Rates

Mortality Rates by Cause, * 2008-2010
Connect To Care
West Virginia Perinatal Telehealth Project

Primary Care Systems, Clay

CAMC Women’s and Children’s Hospital

Roane County Family Health Care

Cabell Huntington Hospital

Valley Health Care, Wayne
Valley Health Care, Fort Primary Care Center, Inc

FamilyCare, Madison

Williamson Memorial Hospital

Community Health Foundation Of Man, Inc

WVU Children’s Hospital

Grant Memorial Hospital, Petersburg

Davis Memorial Hospital, Elkins

Valley Health Systems, Mill Creek

St. Joseph’s Hospital, Buckhannon
Stonewall Jackson Memorial Hospital, Weston

Summersville Regional Medical Center, Summersville

Greenbrier Valley Medical Center, Ronceverte

WV Tertiary Perinatal Referral Centers

Telemedicine sites

WV Obstetric Hospitals Telemedicine sites

Prenatal Clinics Telemedicine sites

Prepared by Ann Dacey
(All locations are approximate)
The Golden Hour

The standardized, evidence-based process of care for the VLBW infant in the first hour of life to prevent complications that may have lifelong effects on the infant.

**Immediate**
- Hypothermia
- Intraventricular Hemorrhage

**Sequelae**
- Chronic Lung Disease
- Retinopathy of Prematurity
- Death
- Neurodevelopmental Impairment
Critically sick neonate needs immediate ICU care for better outcomes.

Birthing centers (Level I/II) need immediate assistance and transfer.

Level III/IV perinatal care centers send team to assist and transfer to the center equipped with desired level of care.

Delay can occur due to poor weather conditions and travel time.
WV Pediatric Telemedicine Services

West Virginia Pediatric Telemedicine Locations

- Perinatal Provider Site Locations
- Outpatient Clinic Locations
- Perinatal Site Locations
- NICU Rounding Locations
WVUMedicine Children’s Transport Team & Telemedicine

- WVUMedicine Children’s Transport Program integrated telemedicine into transport request.

- Assists birthing centers in the stabilization of critically care sick infant while transport is en route.

- Provides family centered care.
Case Study 1

- 31 weeks gestational age
- Significant respiratory distress syndrome, who required immediate ventilator assistance and transfer to NICU.
- Hazardous road conditions due to snowstorm.
- Telemedicine equipment assisted NICU team to assess infant’s color, perfusion, vital signs, chest radiographs and compliance loops on the ventilator.
- Assisted stabilization at referring center.
- Infant was transferred once weather condition improved.
- Outcome: The infant required ventilator support for two days only and hospital LOS was less than two months in our NICU.
Advantages of Telemedicine

- Telemedicine proved to be an effective tool to improve communication, patient care and ultimately improve outcomes of patients with utmost safety of patient and transport crew.
- Ability for tertiary care and community hospitals to utilize telemedicine in the neonatal and pediatric transport requests
Barriers

* Cost
* Infrequency of use
* Proficiency/Education
* Portability
To improve outcomes for mothers and babies through educational programs and quality improvement activities for regional perinatal care providers.

Collaboration with the Division of Neonatology, Maternal-Fetal Medicine and MDTV to offer education to providers in level I and II perinatal centers.
There is limited data about use of simulation during the golden hour to improve outcomes

Helping Babies Breathe Study
Benefits of Simulation

* Promotes Teamwork
  * Teams utilize the same equipment and supplies

* Develops Communication Skills

* Improves Confidence

* Improves Performance

* Improves Outcomes

* Safety
This is Baby Hal

- Loaned to us by WV Perinatal Partnership
- Purchased a monitor
- WVU Steps helped our team with the software application
- Perinatal outreach simulation to improving outcomes
Perinatal education team utilizes simulation based case scenarios on optimization of the care during golden hour. Perinatal education team has recently integrated distant learning via use of simulation and telemedicine.
Special Thanks

* WV Perinatal Partnership
* WVU Steps
* Staff at Grant Memorial Hospital
* MDTV
  * Cindy Barnes, MDTV Program Manager
  * Donovan Monday, MDTV/ITCSS
Unity is strength... when there is teamwork and collaboration, wonderful things can be achieved.

Mattie Stepanek
Perinatal Outreach Team