Timing of Newborn Pulse Oximetry Screenings for Critical Congenital Heart Defect Rates Prior to Discharge

The state of Maryland has mandated newborn pulse oximetry screenings (POS) for critical congenital heart defects (CCHD) be done 24–48 hours after birth on all well babies.

- All RN educated and competent to complete POS
- Masimo Pulse oximetry used
- No consent needed
Critical Congenital Heart Defects

- Hypoplastic left heart syndrome
- Pulmonary atresia (with intact septum)
- Tetralogy of Fallot
- Total anomalous pulmonary venous return
- Transposition of the great arteries
- Tricuspid atresia
- Truncus arteriosus
Small rural hospital with long distant cardiologist consults
Level I nursery
Average stay is <48 hours (49.2 mean)
Newborns are not seen by healthcare provider until 2 days after discharge
Mothers flooded with information from hospital and written material is rarely read
So when to do the POS?
Would doing the POS prior to discharge detect not only the CCHD but other cardiac anomalies? Possibly ductal dependent anomalies that do not present until ductus arteriosus closes (about 72 hours)
Research Project

Literature search
Research Council accept idea
Create and educate team
Develop protocol
Develop tools and consents
IRB approval
Educate staff
Collect data
Analysis of data
Share data and findings
1002 asymptomatic newborns 35 weeks gestation or greater discharged from the newborn nursery were screened by Registered Nurses (RN) at two time points: 24–25 hours of age and at discharge but less than 48 hours of age.

Both pre and post-ductal pulse oximetry readings were done using the same probe and monitor.

Consent was obtained for all newborns participating.
RESULTS

- There were no differences in POS CCHD detection rates for newborns at 24–25 hours of age and at discharge between 28–48 hours of age.
- There were no failed POS.
- Due to RN detected murmurs nine echocardiograms were done.
- Of the 1002 newborns screened, five (0.5%) had a cardiac anomaly.
- One was a CCHD; a tetralogy of Fallot.
# DATA

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Gender # (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>463 (46.2)</td>
</tr>
<tr>
<td>Female</td>
<td>539 (53.8)</td>
</tr>
<tr>
<td>Race /Ethnicity # (%)</td>
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<tr>
<td>Caucasian</td>
<td>615 (61.4)</td>
</tr>
<tr>
<td>African American</td>
<td>237 (23.7)</td>
</tr>
<tr>
<td>Asian</td>
<td>12 (1.2)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>131 (13.1)</td>
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<tr>
<td>Native American</td>
<td>2 (0.2)</td>
</tr>
<tr>
<td>Native American</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5 (0.5)</td>
</tr>
<tr>
<td>Gestational Age</td>
<td>39.2 (1.3)</td>
</tr>
<tr>
<td>Average LOS</td>
<td>49.4 (13.7)</td>
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</tbody>
</table>
# DATA

<table>
<thead>
<tr>
<th>Point of Screening Outcomes</th>
<th>Screen 1</th>
<th>Screen 2</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Mean Hours of Age s.d.</td>
<td>24.2 (1.6)</td>
<td>42.2 (6.1)</td>
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<tr>
<td>Mean R Hand s.d.</td>
<td>98.7 (1.2)</td>
<td>98.7 (1.2)</td>
<td>98.7 (0.9)</td>
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<tr>
<td>Mean R Foot s.d.</td>
<td>99.0 (1.6)</td>
<td>98.9 (1.2)</td>
<td>98.8 (2.2)</td>
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</tbody>
</table>
Conclusions

- The study findings stress the importance of RNs vigilance in newborn assessment skills, screening for CCHDs and CHDs and patient education of signs and symptoms of CHD to report.
How it affected our practice

- Increased awareness of this was only a screening
- Timing of POS did not make a difference!
- Educate staff on importance of discharge teaching of signs and symptoms to report
- Personal and professional goal to improve assessment skills
- Offer neonatal cardiac assessment skills education