Updates to CCHD Screening
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Background Knowledge
• Physical examination alone misses cases of congenital heart disease (CHD)
• Pulse oximetry screening may help detect critical congenital heart disease (CCHD) and ductal dependent lesions
• Current screening guidelines endorsed by AAP

Primary Target Lesions
• Hypoplastic left heart
• Pulmonary atresia
• Tetralogy of Fallot
• Total anomalous pulmonary venous return
• Transposition of the great arteries
• Tricuspid atresia
• Truncus arteriosus
Secondary Targets

- False-positive tests
  - In most studies, has been defined as a positive test which does not lead to diagnosis of one of the 7 target lesions
  - Discrepancy in sensitivity of test depending on what is included in definition
  - May lead to evaluation and diagnosis of other cardiac lesions, lung issues, sepsis, or other disease

Current Recommended Screening

A Modified Algorithm for Critical Congenital Heart Disease Screening Using Pulse Oximetry

- Purpose of study to:
  - "determine the impact of CHD screening" if algorithm modified to have one repeat screen rather than two
  - Evaluate CHD screening as part of quality improvement initiative
  - Retrospective review with simulation study from one tertiary care birth hospital
A Modified Algorithm for Critical Congenital Heart Disease Screening Using Pulse Oximetry

**Original Algorithm**

![Original Algorithm diagram]

**Modified Algorithm**

![Modified Algorithm diagram]

<table>
<thead>
<tr>
<th>CCHD</th>
<th>No CCHD</th>
</tr>
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<tbody>
<tr>
<td>Failed original screen</td>
<td>1</td>
</tr>
<tr>
<td>Passed original screen</td>
<td>6</td>
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Sensitivity 14.3%, Specificity 99.96%, 10 of the false positives had significant non-CCHD disease.

Increased false-positive rate, none had significant diagnosis at time of discharge (2 had echocardiograms).

• Incorrectly screened or interpreted (0.41%)
• Modified algorithm may reduce interpretation errors
• Either algorithm detected only one baby with CCHD
  • May be related to high rate (80%) of prenatally diagnosed disease at this tertiary center
• Further research: Increase sensitivity of screening
Updated Strategies for Pulse Oximetry Screening for Critical Congenital Heart Disease

- Workgroup of stakeholders identified improvements to screening and recommended changes to the algorithm
- 5 modifications considered:
  - Foot (post-ductal) screening only
  - Lower limit of saturation 95% for both measurements
  - Eliminate second retest
  - Change the difference between pre- and post-ductal measurements to 2%
  - Screening before 24 hours of life

Recommendations
- Eliminate the second retest
- Simplify algorithm
- Saturation of both pre- and post-ductal must be 95% or greater
- Both changes may increase number of positive tests
  - “True” or “false” positives

Key Takeaways
- CCHD screening detects disease other than the 7 target lesions
- There may be changes coming for the AAP endorsed guidelines
- It is important to know what is required by law in your state
References