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Pulse Oximetry Testing for Screening for Congenital Heart Defects in Newborns: A Literature Review of the Effectiveness and Accuracy

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Cedarville University School of Nursing
Pulse Oximetry Testing for Screening for Congenital Heart Defects in Newborns: A Literature Review of the Effectiveness and Accuracy
Amanda Custer and Bethany Teixeira

**PATIENT CARE ISSUE**

**Background & Significance**
• Pulse oximetry detects the level of oxygen in the blood
• A deficiency of oxygen can indicate the presence of CHD
• Congenital Heart Defects (CHD) are the number one birth defect in newborns
• CHD contributes to 3% of infant mortality and 46% of deaths from congenital malformations in the first year of life (Turska-Kmiec et al., 2012)

**EVIDENCE-BASED PRACTICE QUESTION**

**Question:** Is pulse oximetry a practical and reliable method to screen for CHD and increase early detection of complex congenital heart defects in newborns?

**P-Asymptomatic newborns**
I- Using a pulse oximetry test to screen for Congenital Heart Defects
C- Pulse oximetry vs. not using pulse oximetry to screen and detect for CHD
O- Using a pulse oximetry is a simple, non-invasive, and cost-effective test that increases the early detection of critical congenital heart defects and thus should be implemented according to specific guidelines.

**REGISTERED NURSE INTERVIEW**

• Interviewed an RN from Miami Valley Hospital’s women’s center on policy
• August 1, 2012 they implemented pulse ox screening for CHD at 24 hrs. old
• Tested on the right hand and either foot for 2 min each
• Test will be negative for CHD if O2 is above 95%
• If below 95%, test again every hr for three hrs
• Physician will be called if still below 95%

**METHODS**

• Articles in past five years (2007-2012) *One exception*
• Articles examining asymptomatic newborns

**Database Search**

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**RESULTS**

• Pulse oximetry testing has a sensitivity of 76.5%
• Specificity for pulse oximetry testing was 99.9%
• Test is moderately accurate for CHD detection
• Test is high for a negative screen for CHD

(Thangaratinam et al., 2012)

**SYNTHESIS OF EVIDENCE**

• Studies used both the hand and foot for screening
• All included a positive test cut off O2 range of 94%-96% with the majority of 95%
• Screening was performed after birth either at 24 hrs., 6-12 hrs., 2-24 hrs., or at discharge
• Type 2 errors were noted and decreased when screened after 24 hrs. after birth
• Retest was performed if under the oxygen saturation cut off
• Physician consult and echocardiogram was ordered if still below cut off

(Thangaratinam et al., 2012; Riede et al., 2008; Griebsch et al., 2007)

**EVIDENCE-BASED PRACTICE RECOMMENDATIONS**

- Performed after the infant is 24 hours old
- Applied to both the hand and the foot
- Applied until threshold is reached
- Below 95%
- Retest
- Below 95%
- Evaluation by a physician and echocardiogram

(Turska-Kmiec et al., 2012)

**REFERENCES**


