

Key Findings: Evaluation of critical congenital heart defects screening using pulse oximetry in the neonatal intensive care unit

A July 2017 article in [Journal of Perinatology](#) evaluated the implementation of early screening for critical congenital heart defects (CCHD) using pulse oximetry in the neonatal intensive care unit (NICU). Screening using pulse oximetry has become a near universal tool to aid in early identification of CCHD. Many states require screening of all infants irrespective of clinical status or setting, posing unique considerations for implementation in the NICU. As literature on CCHD screening in the NICU is limited, the results of this NJ led evaluation represent a major contribution to the field. Twenty-one participating NICUs across five states performed screening at multiple time points using the NJ recommended or AAP endorsed algorithm and modified for those infants receiving oxygen at 24-48 hours. The objectives were to evaluate the feasibility and burden associated with 1) early timing options for screening and 2) exclusion of infants with a prenatal CHD diagnosis, echocardiography conducted before screening, or born at less than 28 weeks gestation from universal CCHD screening in the NICU.

Main findings from this study:

- Of 4120 infants with complete screens, 92% did not have prenatal diagnosis of a congenital heart defect or echocardiography conducted before the screening; 72% were not receiving oxygen at 24-48 hours and 56% were born \geq 2500 grams.
 - 68% had neither pre-identifying factor and were not on oxygen comprising a subgroup who may benefit from early screening.
- Overall fail rate was low (0.9%, n=37)
 - No infant with unsuspected CCHD was identified by screening.
 - One infant with a previously unsuspected CHD was identified by screening.
- Fail rates at 24-48 hours were significantly higher among infants:
 - On oxygen (2.1%) than on room air (0.7%).
 - Born <1000 grams and/or < 28 weeks not on oxygen (7.4% & 9.5%).
- False positive rates were low for infants not receiving oxygen at 24-48 hours (0.5%) and those screened after weaning (0.6%), yet higher among infants born <28 weeks (3.8%) screened at 24-48 hours.
- Unnecessary echocardiograms were minimal (0.2%).
- Low burden of implementation reported by nursing staff.

Key Takeaway: Given the majority of NICU infants were \geq 2500 grams, not on oxygen, and not pre-identified for CCHD, systematic screening at 24-48 hours may be of benefit for early detection of CCHD with minimal burden.

Reference: Van Naarden Braun K, Grazel R, Koppel R, Lakshminrusimha S, Lohr J, Kumar P, Govindaswami B, Giuliano M, Cohen M, Spillane N, Jegatheesan P, McClure D, Hassinger D, Fofah O, Chandra S, Allen D, Axelrod R, Blau J, Hudome S, Assing E, Freed Garg L. Evaluation of critical congenital heart defects screening using pulse oximetry in the neonatal intensive care unit. *J Perinatol*, advance online publication, 27 July 2017 (doi:10.1038/jp.2017.105).

<http://www.nature.com/jp/journal/vaop/ncurrent/full/jp2017105a.html?foxtrotcallback=true>