

Echocardiography in the normal newborn nursery

Purpose: We evaluated the utility of echocardiograms in the normal newborn nursery (NNN) in the era of improving prenatal diagnosis and pulse oximetry screening for critical congenital heart disease.

Methods: We reviewed the charts of all newborns that had echocardiograms in the Meriter Hospital NNN from January 2008 through December 2015. Pulse oximetry screening for critical congenital heart disease was performed throughout the study. Only the first echocardiogram done on each patient was included and infants transferred to the neonatal intensive care unit prior to echocardiography were excluded. Charts were reviewed to categorize the indication for echocardiography, impact on patient care, and echocardiographic findings. In addition, nursery physicians were surveyed to determine their specialty, management of murmurs in the NNN, and whether their evaluation of murmurs has changed since completing residency.

Results: 26,565/30,430 infants born at Meriter during the study period received their care in the NNN, of which 501 (1.89%) had echocardiograms. Over the study period, the percent of infants with echocardiography increased from 1.02% in 2008 to 2.59% in 2015 ($p < 0.0001$). The most common indication for echocardiography was a murmur (71%), followed by abnormal findings on fetal ultrasound (9%). Four babies had echocardiography due to failed pulse oximetry in the NNN, three had normal echocardiograms and one had persistent fetal circulation. 51% of studies were normal, 41% showed incidental findings (the most common being small muscular VSDs) 5.6% had findings that necessitated outpatient cardiology follow-up, and 2% resulted in some change in care before hospital discharge. Of the 10 infants with a change in neonatal management, 7 needed only increased monitoring or supplemental oxygen and 3 required neonatal surgical intervention. One had prenatally suspected coarctation confirmed by echocardiography after birth and two had a postnatal diagnosis of aortic stenosis with loud (3/6 or 4/6) murmurs. Another 14 newborns were diagnosed with conditions that would likely require surgical correction in infancy, but were discharged home from the NNN (VSD-6, AV Canal 4, VSD/PS, Coarctation, Aortic Stenosis, Tetralogy of Fallot).

17/501 of babies with echocardiography in the NNN had structural heart disease which would likely require surgical intervention (3.4%). This was the same in the subset of echocardiograms performed because of a heart murmur, 12/356 (3.4%).

Sixty four of 135 (47%) physicians completed the survey (Pediatrician-30, Family Practitioner-29, Other-5). Physicians completed residency an average of 17 years prior to the survey (range 1-39 years) with only 2 pediatricians and 5 family practitioners in practice for less than five years. In the scenario of an asymptomatic infant with a 2/6 systolic murmur, normal pulses, and normal pulse oximetry, 30% of respondents would order an echocardiogram before discharge, 24% would schedule early outpatient follow-up, and 24% would provide routine follow-up with the primary care provider. Pediatricians indicated that they had become more likely to order echocardiograms with time, whereas family physicians reported they were less likely.

Conclusions: The use of echocardiography in the NNN has increased with time and identifies significant heart disease in a small but important number of infants.