



NICU Reporting



Alyssa Yang
CDC/CSTE Applied
Epidemiology Fellow
February 28, 2014



NICU Definitions

- Level I nurseries are normal newborn nurseries.
- For this discussion, **NICU** will refer to Level II and III nurseries as defined by the AAP.
- The longer the NICU stay, the less likely there is to be a missed diagnosis of Critical Congenital Heart Disease (CCHD).
- The NICU probably represents the site of least need for pulse oximetry screening.



NICU Pulse Oximetry Reporting

- Pulse oximetry screening is reported on the newborn screening blood card in Wisconsin.
- **Appropriate** in term infants with short hospital stays and a single blood card sample.
- **Inappropriate** for many NICU patients who may be on supplemental oxygen or have non-cardiac disease processes that would cause hypoxia and who may have multiple blood cards collected during their hospitalization.



NICU Protocol

- Standard pulse oximetry screening algorithm
 - Off supplemental oxygen past 24 hours, OR
 - When on stable home oxygen prescription
- Exclusions
 - Known congenital heart disease
 - Previous Echocardiography
- CCHD screening performed only once



NICU Protocol

- If a baby is not eligible for pulse oximetry screening at the time of the first newborn blood screening, the newborn blood card is photocopied before blood sample is collected.
- Once the baby becomes eligible for pulse oximetry screening, results are recorded on the photocopy and sent to the Wisconsin State Lab of Hygiene.



NICU Protocol

- Advantages:
 - Uniform screening algorithm for all babies
 - Single entry into EMR
 - Maximizes reporting
- Disadvantages:
 - Requires photocopy to follow baby through NICU or upon transfer back to normal nursery
 - Benefits to NICU population unproven



NICUs in Wisconsin

- Estimates based on information from Wisconsin Association for Perinatal Care (WAPC):
 - 60 Level I NICUs
 - 24 Level II NICUs
 - 17 Level III NICUs
- Current NICUs Enrolled in SHINE:
11 Level II, 6 Level III



NICU Pulse Oximetry Quality Assurance

- Level IIIB NICU
- 38 Beds
- CCHD, ECMO, tracheostomy, and other complex surgical patients transferred to children's hospital
- Regional referral patients could be returned to their local NICU or discharged home
- NICU discharges 1-1-13 to 12-31-13



2013 NICU Screening

- 415 babies discharged from single NICU
- Deaths and transfers excluded
- Average length of stay: 20.9 days
 - Range: 1-150 days
- 128 (30.8%) had echocardiography performed for other purposes
- NICU performed pulse oximetry regardless of echocardiography status



NICU Screening Outcomes

- Passed screening: 386 (93%)
 - Two required repeat testing to pass
- Failed screening: 0
- Equivocal screening not repeated: 7
- Not screened: 22



Incomplete or No Screening

- **29/415 (7%)**
- **Incomplete Screening: 7 Babies**
 - Average length of stay: 7.2 days
 - Range: 2-24 days
- **Not Screened: 22 Babies**
 - Average length of stay: 14.7 days
 - Range: 1-110 days
- **12 (41.4%) had prior echocardiography**
 - vs. 30.8% of those with complete screening



NICU CCHD Safety Net

- **386** passed their screening.
- **12** (2.9%) did not complete the screening process but had echocardiography, which excluded CCHD.
- **17** (4.1%) neither completed the screening process nor had an echocardiogram to exclude CCHD.



One Year of NICU CCHD Screening

- Complete screening occurred in 93% of infants.
- No echocardiograms were performed because of pulse oximetry screening.
- Repeat measurements were rarely needed.
- The process was more likely to break down in babies with shorter NICU stays.
- Babies with incomplete screening were more likely to have had a previous echocardiogram.



Thank you!

Any questions?

Contact information:

- alyssa.yang@dhs.wisconsin.gov
- jhokanson@pediatrics.wisc.edu
- sharon.fleischfresser@dhs.wisconsin.gov