

Challenges Ensuring Hearing Screening and Follow-up for Infants Transferred to a Neonatal Intensive Care Unit



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National Initiative for Children's Healthcare Quality (NICHQ) Learning Collaborative

- Funded through Maternal and Child Health Bureau
- Broad goal: Improve the health and well-being of children and youth with special health care needs
- Achieve in 12 months a breakthrough improvement, accomplished through small tests of change
- Reduce delays and loss to follow-up for infants who do not pass the newborn hearing screening



Massachusetts Project Partners

- Massachusetts EHDI Program
- Beth Israel Deaconess Medical Center
- Brigham and Women's Hospital
- Other Birth Facilities
- Children's Hospital Boston
- Registry of Vital Records and Statistics
- Systems that serve homebirths



Beth Israel Deaconess
Medical Center

A TEACHING HOSPITAL OF HARVARD MEDICAL SCHOOL



BRIGHAM AND
WOMEN'S HOSPITAL

A Teaching Affiliate of Harvard Medical School



Children's Hospital Boston

life-changing care world-changing research



MA NICHQ Aim Statement

- Ensure all infants that were transferred at birth, including NICU, special care, or retro-transferred infants will receive a hearing screening as soon as medically appropriate
 - Recognized that there is a higher incidence of hearing loss in this population (>30% of newborns with hearing loss have other special healthcare needs)¹
- Ensure all infants that were born at home receive a hearing screening

1. Pediatrics. 2000 Sep;106(3):616-7; Van Naarden K, Decoufle P, Caldwell K.



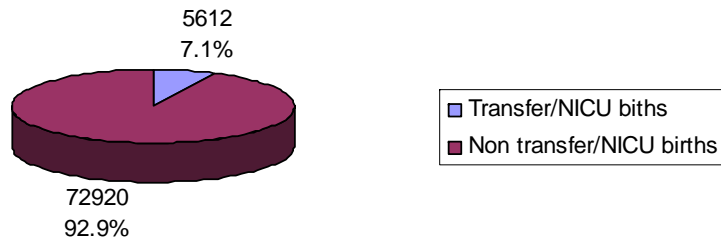
2006 Massachusetts Data

- 78,532 infants born and 5,612 (7.1%) infants transferred/NICU
- 1,299 (1.7%) referred overall, 205 (3.7%) referred from transferred/NICU population
- 226 (~1/6 of overall referred) infants identified with permanent hearing loss
- 63 (~1/3) of referred transferred/NICU infants identified with permanent hearing loss
- **27.9% of infants with permanent hearing loss were transferred/NICU**

Proportion of NICU/Transfers in overall births and hearing loss populations

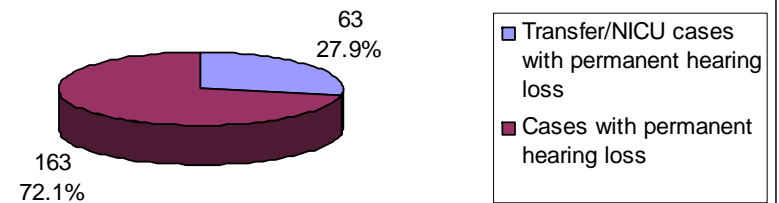
Transfer/NICU births, 2006

Overall = 78,532



Transfer/NICU cases with permanent hearing loss, 2006

Overall total = 226





Focus on improving hearing screening rates among transferred/NICU babies

- In 2006, 99.2% of all Massachusetts births were screened for hearing loss.
- In the same year, only 96.4% (5299 out of 5498) transferred/NICU babies were screened.
- ***At least*** 69.9% of these transferred/NICU babies had one or more risk factors for hearing loss (3843 out of 5498).²

2. Nine risk factors recorded on the EBC were considered: prematurity, low birth weight, maternal genital herpes, maternal rubella infection, positive toxicology screen, assisted ventilation for any period of time, Down's syndrome, cleft lip, or cleft palate.



PDSA Cycles

- Plan
 - Plan to answer questions – test change
- Do
 - Carryout plan, document problems, and unexpected observations
- Study
 - Complete analysis of data
- Act
 - What changes are to be made?
 - Plan for next PDSA



Early Process

- Attended Learning Collaborative meetings to learn about small tests of change theory and to gain insight from other states
- Analyzed NICU/Transfer data and compared to all newborn data
- Identified stakeholders
- Met with Advisory Committee to refine objectives
- Administered a survey to all birth facilities to determine current screening technology being used (ABR, OAE, or combination)



PDSA 1

Objective

To determine if infants in the NICU are medically eligible for hearing screening prior to transfer out to special care nurseries



PDSA 1

Questions

- What age are infants being transferred out?
- What medical conditions requiring treatment are present in transferred infants?
- Is it feasible to screen more infants prior to transfer?
- How many infants are medically ineligible for screening because of age or medical condition?



PDSA 1

Plan

- Identify all infants transferred out of the NICU at Beth Israel Deaconess and Brigham and Women's Hospital
- Review discharge summary of transferred infants for the following:
 - age at time of transfer
 - medical conditions requiring treatment (oxygen, phototherapy, ototoxic medications)
- Consult NICU medical personnel for any additional information on infants for whom there are any questions regarding status or treatment



PDSA 1

Do

- Review summaries from April-June 2008
- Determine number of babies eligible for hearing screen prior to transfer
- Draw conclusions regarding feasibility of screening prior to transfer



PDSA 1

Study

- Looked at total of 77 transferred babies
 - 43 babies required medical/surgical intervention
 - 26 babies <34 weeks at time of transfer
 - 2 babies were transferred immediately after delivery due to census issues (no bed available in NICU)
 - 6 babies eligible for hearing screening
 - 4 were 34-35 weeks gestation



PDSA 1

Act

- Create policy/algorithm regarding the timing of screening transferred NICU infants based on data accumulated and present to DPH Advisory Committee for review and approval
- Communicate findings and policy to newborn hearing screening directors



PDSA 1

Findings

- Infants are nearly always transferred out when they are too young for screening.
- Infants who meet the required age typically have medical conditions that preclude screening.



PDSA 1

Barriers and Breakthroughs

- Special care nursery nurses are generally the gatekeepers for newborn hearing screening decisions for infants transferred in from the NICU.
- Limited information is available to DPH about babies who are deceased or transferred again before screening.



PDSA 1

Lessons Learned

- Requiring newborn hearing screening prior to transfer from the NICU to another special care nursery is not a realistic mechanism for insuring that infants receive screening.
- Hearing screening data should be verified on infants transferred from a NICU to a special care nursery at another hospital. If screening data is not available, it should be assumed no screen was performed.
- Birth facilities need guidance to ensure infants that spend time in a NICU receive an ABR if they are transferred to a facility that does not use that technology.



PDSA 1

Lessons Learned Continued

- Infants with risk indicators (e.g., aminoglycosides, low birth weight) may need to be screened again or referred for audiological testing prior to discharge.
- Almost all infants transferred needed specialized medical attention, and were not being transferred back to community hospitals for feeding and growth.
- MA policy only allows for a total of two hearing screens when an infant fails the screen and this is difficult to monitor when infants are in multiple facilities.



PDSA 2

Objective

Reduce the number of missed hearing screenings for babies discharged from the Neonatal Intensive Care Unit (NICU).



PDSA 2

Questions

- What is the best method for tracking transferred infants (only birth hospital has access to EBC)?
- What is the number of babies who actually miss hearing screening vs. those whose hearing screening information has not been reported?
- What are the reasons for missing information?
- Who determines if babies being transferred were in need of screening?
- If babies were screened, were they screened again?



PDSA 2

Plan

- Beth Israel and Brigham and Women's Hospitals identified facilities that received infants transferred out of their NICUs and did not send screening results to DPH for babies born during the first quarter of 2008.
- Obtain names of directors of those screening programs from DPH.



PDSA 2

Do

- Contact 4 hospitals accepting at least 5 infants transferred from the NICU on whom we have no hearing screening report.
- Determine if hearing screening was performed.
- Receive a fax of results for all babies that had a hearing screening.



PDSA 2

Study

- Analyze percent of infants who have missed screening vs. those who have been screened but are missing information regarding screening results
- Determine why infant(s) were missed or why screening information was not transmitted



PDSA 2

Act

- Make policy or procedure changes accordingly



PDSA 2

Barriers and Breakthroughs

- Interpretations varied for when a transferred newborn should be screened (e.g., prior to discharge from the NICU to another facility, prior to discharge to home)
- Primary issue for transferred infants is timely faxing of hearing screening information
- Many screening directors do not have access to census of babies transferred in



PDSA 2

Lessons Learned

- Most infants were screened, but data was never reported to DPH.
- Transmittal form was being used for multiple purposes and did not include DPH's fax number.
- Some hearing screening programs do not have a method of reconciling data to ensure all babies that are transferred to their facility have received a hearing screen.



Next Steps

- Developed new data transmittal form and tested it at four facilities
 - Two facilities were compliant – two need reminders
- Distribute new data transmittal form statewide
- Repeat PDSA 2 after new transmittal form is released
- Develop in collaboration with the Advisory Committee policy documents “best practices” and algorithm for screening transferred infants
- Continue to analyze data and repeat PDSA if needed



Questions

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Screening Program