

THE LEARNING CURVE AND FAILURE RATES OF NEWBORN HEARING SCREENING PROGRAMS IN WASHINGTON

KATHRYN BORGMANN
PEDIATRIC AUDIOLOGY TRAINEE
FACULTY COMMITTEE MEMBERS: RICHARD C.
FOLSOM, PH.D. AND JULIE BIERER, PH.D.

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Background

Universal Newborn Hearing Screening Programs:

- Implemented in every state
- Has helped to reduce average age of identification
 - Early identification and intervention leads to better outcomes in children with hearing loss (Yoshinaga-Itano, 1998)
- Currently over 98% of newborns in Washington State are being screened at birth
- Benefits are well documented; however, criticisms still exist

Background

Common Complaint with (UNHS) Programs: High Failure Rates

Joint Committee on Infant Hearing states referral rate for diagnostic evaluation should be < 4% (Joint Committee on Infant Hearing, 2007)

- **Incidence of congenital hearing loss is approximately 3/1000 infants (Finitzo, 1998)**

Background cont...

High failure rates lead to:

Increased cost

Over-referrals for audiologic testing

Possible increased anxiety for parents

Decreased support for the programs

Less likely to encourage follow-up

Background cont...

Some factors influencing failure rates

- Congenital hearing loss
- Transient blockage in outer/middle ear
- **Screener performance/learning curve**

Background cont...

The Learning Curve - increased screener experience will decrease the number of failures

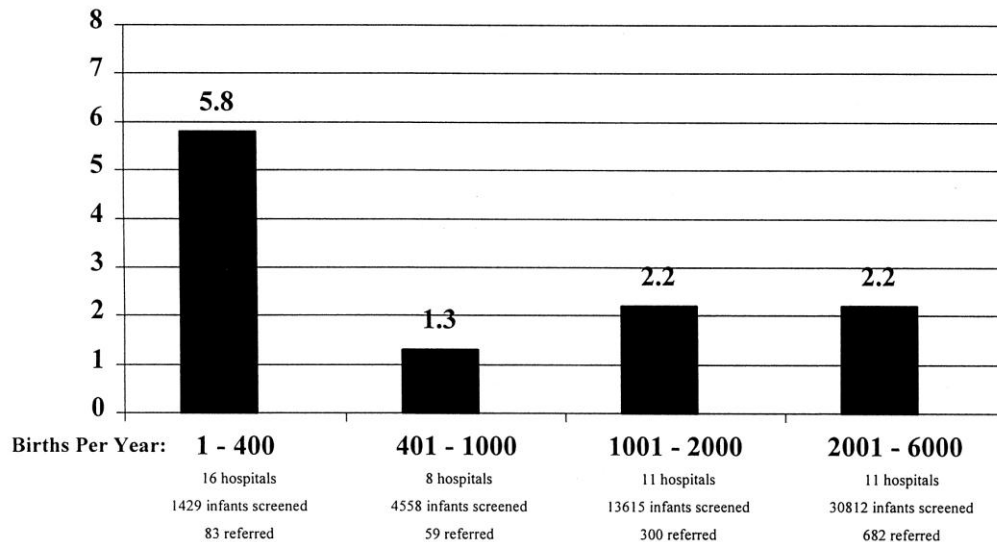
Factors influencing learning curve:

- Probe fit/electrode placement
- Environmental manipulations
- Troubleshooting/indentifying malfunctioning equipment

Differences in Rural and Urban Hospitals

Mehl and Thomson (2002)

Fig 5. Percentage of newborns referred for rescreening by hospital size (as measured by births per year at each hospital)



Purposes of Current Study

1. Evaluate the relationship in referral rates between small and large hospitals in Washington.
2. Evaluate the relationship in referral rates between hospital size and screening methods, including otoacoustic emissions, auditory brainstem response, and a two-stage screening process.

Methods

Data

- Washington State Department of Health Early Hearing Loss Detection, Diagnosis, and Intervention Tracking and Surveillance System (EHDII database)
- 65 Hospitals

Groups

- Hospital Size
 - Small Hospital (<1000 infants associated with hospital)
 - n=37
 - Large Hospital (>1000 infants associated with hospital)
 - n=28
- Screening Method
 - ABR
 - OAE
 - 2-Stage (ABR and OAE)

Results

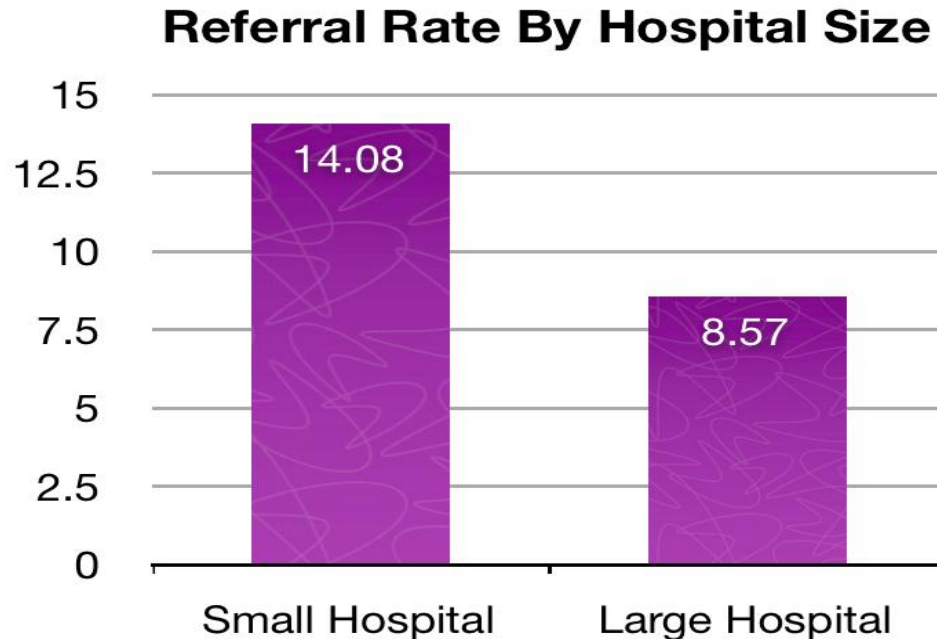


Figure 1. *Referral Rate by Hospital Size. Small vs. Large.*

Graph of the referral rate of newborn hearing screening programs for small and large hospitals, N=65 (Small=37, Large=28). Each bar demonstrates the average referral rate for each of the two categories of hospitals. The mean referral rate was approximately 14.08% (std. deviation=1.12) in small hospitals and 8.75% (standard deviation=0.73) in large hospitals. Results of t-test reveals a p-value of 0.016.

Results Cont...

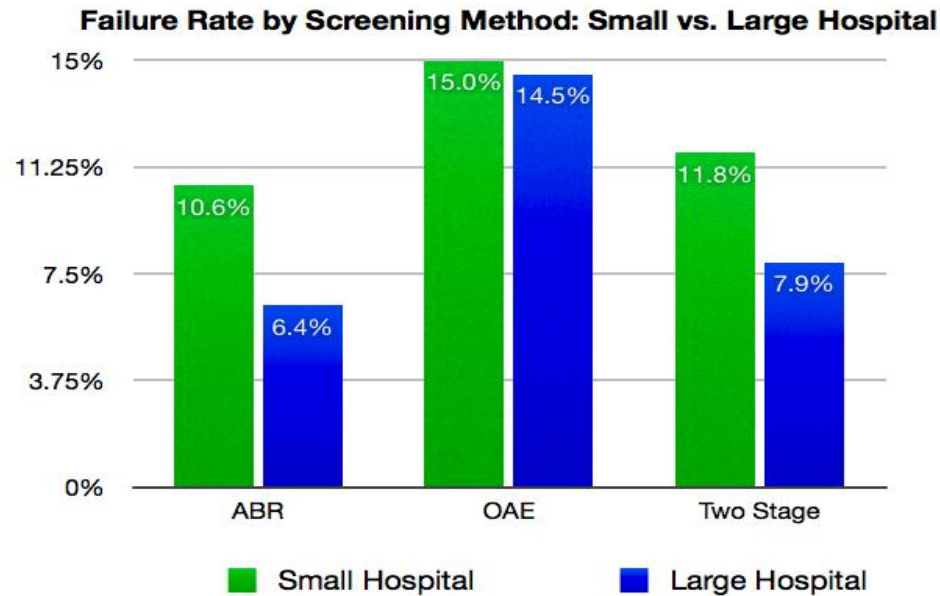


Figure 2. Referral Rate by Screening Method.

Graph of the referral rate of newborn hearing screening programs by screening method and hospital size. N=65 (Small Hospital (SH)/ABR=5, Large Hospital (LH)/ABR=14, SH/OAE=28, LH/OAE=6, SH/2-Stage=4, LH/2 Stage=8). Each bar demonstrates the average referral rate for each of the two categories of hospitals (large and small) and each of the screening methods. Results of t-tests reveal no significant difference in referral rates between hospital size and screening method (p-value for ABR=0.33, OAE=0.89, Two Stage=0.57).

Conclusions

There is a learning curve associated with universal newborn hearing screening programs in Washington, with large hospitals having significantly lower failure rates than small hospitals.

There is no significant difference in referral rates by hospital size and screening method, suggesting that each screening method has a similar learning curve.

Importance of the Study

The goal is to focus on the aspects of screening that we can easily improve

If we can identify where problems occur, we can take steps to improve these programs

Acknowledgements

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