EI Enrollment in Children with Hearing Loss: Impact of Service Delivery Model

Ursula M. Findlen, PhD, Tabbetha Greco, EdD, Gina Hounam, PhD, Riley Bayer, BS, Kaleigh Matesick, MA & Prashant Malhotra, MD

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Disclosures

All: Employment at Nationwide Children’s Hospital

U. Findlen: Employment at The Ohio State University Wexner Medical Center, Research Support- Advanced Bionics, Inc.

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Background


• JCIH (2013) further recommended that EI enrollment should be facilitated by a service coordinator with specialized knowledge and skills with individuals who are deaf or hard of hearing (D/HH) [2]

• Late EI enrollment can lead to additional delays in speech/language development which can have long-lasting effects [3-6]
Specific Aim- Quality Improvement (QI) Study

To evaluate the influence of service delivery model at the state EHDI level on EI enrollment and IFSP goal formulation for children with hearing loss.
Service Delivery Model Change

Regional System

• Through Sept. 2016
• Made initial contact at time of screening referral and helped to coordinate services with service coordinator
• RIHP- Specialized provider with knowledge in children with hearing loss
• Multiple attempts to make contact

Central System

• October 2016 to present
• Referrals placed to central intake at time of diagnosis
• Non-specialized service coordinator assigned
• Teaming model used with specialized provider involved only upon family request
• Limited to three attempts to make contact for services
QI Study Design

- Retrospective eMR and EI database review
- Children in the NCH Hearing Program diagnosed with permanent hearing loss between 2015 and 2018

**Hearing Variables**
- Date and age at hearing loss identification
- Type & Degree of hearing loss
- Device use
- Comorbid Diagnoses
- Gender
- County/State of Residence
- Language(s) spoken in the home

**EI Variables**
- Initial Referral Date
- Number of Referrals
- Referral Source
- Enrollment
- IFSP Formulation
- Communication Goal on IFSP and/or specialized providers involved with care
- Quantity of Services (minutes/6 months)
- Reasons for:
  - Not Referred
  - Not Enrolled
  - Discontinued services
Results

• During the study period, **393 children** were identified with permanent hearing loss. Children came from 51 Ohio counties, 7 neighboring states, and one international country.

• More children were identified with **mild hearing loss** ($x^2 = 6.292, p = 0.043$) and fewer children were fit with **amplification** ($x^2 = 10.279, p = 0.001$) during the central system time period, otherwise population make-up across service delivery models was similar.

• Children who were referred from a **specialized, hospital-based EI enrollment service, medical provider, or parent** were more likely to enroll in EI than children who were referred from a government agency ($x^2 = 11.231, p = 0.024$).
Referral and Enrollment Rates

- **Referred Enrolled Communication Goal**
- **Percent of Infants**

<table>
<thead>
<tr>
<th>Referred</th>
<th>Enrolled</th>
<th>Communication Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional</td>
<td>Central</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>82</td>
<td>74</td>
</tr>
<tr>
<td>90</td>
<td>71</td>
<td>54</td>
</tr>
</tbody>
</table>

* p < 0.001
** p = 0.05
Enrollment Over Time

Percent of Referred Infants

Regional

Central

Enrolled

Communication Goals

Jan.-June 2015
July-Dec. 2015
Jan.-June 2016
Jan.-June 2017
July-Dec. 2017
Jan.-June 2018
July-Dec. 2018
Regression Analysis- Enrollment in EI

Univariate Analysis- children were more likely to be enrolled if:
- Identified during the regional service delivery model \( (p = 0.0005) \)
- Bilateral hearing loss \( (p = 0.002) \)
- Greater degree of hearing loss \( (p = 0.04) \)
- Used amplification device(s) \( (p = 0.01) \)
- Male \( (p = 0.04) \)

Multivariate Analysis- when adjusting for gender, device use, and comorbid disabilities, significant predictors of enrollment included:
- Identified during the regional service delivery model Odds Ratio = 3.21 [1.50-6.73]
- Bilateral Hearing loss Odds Ratio = 2.14 [1.13-4.06]
## Reasons Not Enrolled

<table>
<thead>
<tr>
<th>Reason</th>
<th>Regional N (%)</th>
<th>Central N (%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to make contact with Family</td>
<td>3 (30)</td>
<td>31 (70.5)</td>
<td>34 (63.0)</td>
</tr>
<tr>
<td>Family not Interested</td>
<td>6 (60)</td>
<td>10 (22.7)</td>
<td>16 (29.6)</td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (10)</td>
<td>3 (6.8)</td>
<td>4 (7.4)</td>
</tr>
<tr>
<td>Totals (N)</td>
<td>10</td>
<td>44</td>
<td>54</td>
</tr>
</tbody>
</table>
Regression Analysis- Communication Goals

**Univariate Analysis**: children were more likely to have communication goals on their IFSP if:
- Identified during the regional service delivery model \((p = 0.055)\)
- Used amplification device(s) \((p < 0.0001)\)

**Multivariate Analysis**: when adjusting for type of hearing loss and comorbid disabilities, the only remaining significant predictor of hearing services was use of amplification device(s) Odd Ratio: 5.18 [2.82, 9.51]
Conclusion

Service delivery model can significantly impact EI enrollment for children with hearing loss.

Service delivery model may also impact services provided.
Thank you

The Hearing Program
Oliver F. Adunka, MD
Prashant S. Malhotra, MD
Edward Dodson, MD
Emily Seitz, RN
Andrea Gates, RN

Audiology Program Manager
Gina M. Hounam, PhD

Speech Pathology Program Manager
Lindsey Pauline, MA, CCC-SLP

Hearing Impaired Speech Team
Shana Lucius, MA, CCC-SLP
Janelle Huefner, MA, CCC-SLP
Lauren Wills, MA, CCC-SLP
Lauren Yoshihiro, MA, CCC-SLP

Audiology Team Leadership
Rebecca Belt, AuD- Clinical Lead
Holly Gerth, AuD- Clinical Lead
Michelle Shannon, AuD- EBP Coordinator
Ursula Findlen, PhD- Research Coordinator

Audiology Team
Sandra Alston, AuD
Virginia Bolster, AuD
Nikia Bridges, AuD
Lindsey Cameron, AuD
Lauren Durinka, AuD
Jamie Godsey, AuD
Alecia Jayne, AuD
Melissa Kappes, PhD
Rebecca Matsche, AuD
Christine Schafer, AuD
Nicole Schuller, AuD
Cindi Warner, AuD
Krista Winner, AuD

Early Intervention Team
Tabbetha Greco, EdD
Kaleigh Matesick, MA, EIS
References


