Quality Improvement in Universal Newborn Hearing Screening
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ABSTRACT
• Hospital-based universal newborn hearing screening (UNHS) programs are encouraged to maintain quality assurance protocols, but many hospitals lack the time and resources to institute this process.
• We studied a practical approach to measuring baseline quality indicators and identifying improvement opportunities in UNHS programs.

RESULTS
• We determined screening processes and quality indicators for UNHS programs at four hospitals through site visits and a two-fold retrospective review of nursery and audiology records.
• Nurses, audiologists, and otolaryngologists met for feedback of hospital-specific quality indicators. The sessions identified improvement opportunities and proposed system changes for immediate implementation.
• Hospitals screened 21,957 newborns for hearing loss. Screening rates were greater than 99% at all hospitals.
• Rates of referral and diagnostic testing varied significantly across hospitals. Low referral rates prompted two hospitals to adjust screening processes to reduce potential false-negative screening results. Two other hospitals addressed poor diagnostic follow-up by changing the referral process to include additional family contact information.
• Hospitals also recognized that referral to Early Intervention (EI) for child-find referrals increased the likelihood of diagnostic follow-up. EI families were encouraged to enroll infants in EI, and two pediatric audiology centers in Buffalo, NY and two other hospitals addressed poor diagnostic follow-up.
• Documentation of hearing aid eligibility and enrollment for EI were also identified for retrospective determination of these quality indicators.

CONCLUSIONS
• We reviewed records at each of four birthing hospitals and two pediatric audiology centers in Buffalo, NY and identified all infants who did not pass newborn hearing screening from 2007-2008 (Figure 1).
• We recorded the presence of risk factors for hearing loss, timing of follow-up, results of diagnostic testing, and timing of interventions for each infant.
• We calculated quality indicators for each hospital and compared these with JCHI guidelines (Table 1).
• We arranged multidisciplinary meetings for feedback of quality indicator data to each hospital. Meetings included otolaryngologists, nurses (UNHS coordinators and nursery supervisors), and pediatric audiologists.
• We encouraged each group to endorse at least one intervention for immediate implementation.

HYPOTHESES
• A two-year retrospective review of quality indicators will yield sufficient data to compare local quality indicators with JCHI guidelines.
• Feedback of quality indicators to each hospital and audiology center will identify opportunities for improvement for immediate implementation.

METHODS
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• We calculated quality indicators for each hospital and those were compared with JCHI guidelines (Table 1).
• We reviewed records at each of four birthing hospitals and two pediatric audiology centers in Buffalo, NY and identified all infants who did not pass newborn hearing screening from 2007-2008 (Figure 1).

TABLE: UNHS GUIDELINES

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<th>Age</th>
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<th>Definition</th>
<th>Guideline</th>
<th>US Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Month</td>
<td>Screening</td>
<td>100%</td>
<td>&gt; 95%</td>
<td>55-100%</td>
</tr>
<tr>
<td>75 CHIE Referral</td>
<td>Screening</td>
<td>Referral to Early Intervention (EI)</td>
<td>&gt; 4%</td>
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<tr>
<td>3 Months</td>
<td>Diagnostic Testing</td>
<td>Completed Diagnostic Testing (in)</td>
<td>Referral to EI</td>
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<td>Hearing Loss</td>
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• Rates of referral and diagnostic testing varied significantly across hospitals. Low referral rates prompted two hospitals to adjust screening processes to reduce potential false-negative screening results (Figure 7).
• Two other hospitals addressed poor diagnostic follow-up by changing the referral process to include additional family contact information (Figure 7).
• All hospitals clarified responsibility for making appropriate referrals (Figure 7).
• There was insufficient documentation to calculate quality indicators for hearing aid eligibility and early intervention.

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• Feedback of quality indicators to each hospital and audiology center will identify opportunities for improvement for immediate implementation.
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ABSTRACT
• Permanent congenital hearing loss (PHL) is the most common birth defect, affecting 1 to 3 of every 1000 newborns.
• Effective universal newborn hearing screening (UNHS) programs improve language outcomes by identifying infants with PHL and facilitating early intervention (EI).
• The Joint Commission on Infant Hearing (JCHI) recommends routine monitoring of quality indicators in UNHS programs (Table 1).
• Reported outcomes for diagnostic follow-up and early intervention vary significantly across the United States.

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