A Model Program for Periodic Medical Home Childhood Hearing Screening

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Childrens Hospital Los Angeles and USC Keck School of Medicine
Project Background

- California has historically lagged behind in universal newborn hearing screening -- even though 1/8 of all babies with hearing loss are born there!
- AB 2780, 2002 – only CCS-approved hospitals required NBHS prior to discharge
- AB 2651, 2008 - *All* Birthing Centers now required to do UNHS prior to discharge
Project Background

• The good news: California does a good job of follow-up on the babies that they screen
• However: Babies still fall through the cracks;
  – The information about follow-up may not get to the family (language barriers, emotional issues)
  – Logistical issues may prevent completion of testing
• Hypothesis: Perhaps better continuity of care if screening is done in the child’s medical home
Addressing the Fallout Of Newborn Screening

Government and Researchers Seek to Reduce False Positives, Improve Physician Education and Follow-Up for Families

By Shirley S. Wang

The recent adoption of widespread screening of newborns for congenital health problems is saving thousands of lives every year, identifying potentially deadly conditions in time to begin treatment. But now, health-care professionals recognize that success has highlighted glitches in the system.

More screening means more potential for erroneous test results and misdiagnoses, causing needless angst for parents. Doctors and hospital officials, who must inform new parents about the screening process, are often ill-informed about the diseases that are screened for and how they are treated. And once a diagnosis is confirmed, families may get little follow-up as they struggle with the overwhelming logistics of caring for their sick infant.

To improve the screening process, health providers and government officials are starting to expand beyond the push for more screening to also address shortcomings in the entire system. Efforts include creating a national standard for assessing screening, in order to cut down on false positives. Genetics experts are developing an online map of specialists across the country to help families find treatment. And researchers and health officials are working to educate doctors about screening and create state registries to track the long-term impact of early diagnosis.

“We’re trying to see the newborn screening as a system and not a lab test,” says Ranil Singh, associate professor and director of the Genetics Metabolic Nutrition Program at Emory University in Atlanta, which has been working in a collaborative of southern states to improve access to genetic services.

Newborn screening has grown exponentially over the past two years—the result of years of effort by health experts and patient advocates. All 50 states now mandate newborn screening for the 29 conditions recommended by the American College of Medical Genetics, compared with 38% in 2005, according to the March of Dimes.

The conditions, many of which are metabolic disorders that interfere with how the body breaks down and absorbs nutrients, are typically rare. With some, fewer than 1 in 10,000 are affected. But Unintended Impact

Some problems have cropped up with newborn screening:

- False Positives: Second and even third tests are sometimes needed to rule out false positives and confirm the diagnoses.
- Ill-Informed Doctors: Some pediatricians aren’t familiar with the screened-for conditions, or where to find specialists for treatment.
- Lack of Follow-Up: States are only beginning to track patients to monitor the long-term impact of early diagnosis.

Please turn to page D3.
How is *Baby Sound Check* different?

- Many babies fail newborn screens solely because they have debris/vernix in the ear canal or residual fluid in the middle ear
- Initial screening **at 2 weeks of age** should dramatically reduce the numbers of false positives
- All babies (even if they pass the initial screen) will be **re-screened periodically** till age 3.
- Catch late-onset or progressive hearing loss
How is *Baby Sound Check* different?

- Adding Acoustic Reflexes to OAE testing can rule out Auditory Neuropathy
- **Early and periodic screening** addresses the goals of
  - American Academy of Pediatrics
  - Healthy People 2010
  - Bright Futures
  - Early and Periodic Screening, Diagnosis, and Treatment Program (EPSDT)
How is *Baby Sound Check* different?

- The John Tracy Clinic spirit infuses every aspect of the program
  - Parent involvement every step of the way
  - “Hope, guidance and encouragement”
- The integrated follow-up protocol has a series of checks and balances
  - Families monitored in medical home and at JTC
  - Helps ensure that no families fall through the cracks
Video
Project Goals & Objectives
Goals

• Create a *sustainable* model for hearing screening in community-based clinics
• Screen infants and toddlers who are
  – missed at birth,
  – incorrectly diagnosed or
  – lost to follow-up
Goals

• Integrate comprehensive hearing screening into routine well-baby care within the medical home
• Provide continuity of care and follow-up
• Replicate and disseminate the model
Outcomes

• 10,000 infants and toddlers will be screened for hearing loss as part of well-baby care
• Statistics suggest that 30-60 babies will be diagnosed with permanent hearing loss
• Another 60-120 will have late-onset and progressive losses
• Also, 500 children will be discovered to have undiagnosed but treatable middle ear problems

• Ultimately, all parents involved will obtain information about their child’s hearing status
• Children who do not pass the hearing screening will receive diagnostic evaluations

• Children with permanent hearing loss will be enrolled in early intervention programs
Outcomes

• All families will receive culturally appropriate family support
• All families will preserve linkages with a medical home
• Data will be linked with other relevant health data
Screening procedure
Baby Sound Check™
Hearing Screening Technology
“Testing, 1…2…3”

• Otoacoustic Emissions (OAE)
  – Test of inner ear function
• Tympanometry (“Tymps”)
  – Test of middle ear function
• Acoustic Reflexes (AR)
  – Test of auditory nerve function
## Possible outcomes

<table>
<thead>
<tr>
<th>Pass all three tests</th>
<th>Periodic screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refer OAEs <strong>and</strong> tympanometry</td>
<td>Middle ear problem: see physician and re-screen</td>
</tr>
<tr>
<td>Refer OAE, <strong>pass</strong> tympanometry</td>
<td>Possible cochlear problem: diagnostic evaluation at JTC</td>
</tr>
<tr>
<td>Pass OAE and tympanometry, <strong>refer</strong> reflexes</td>
<td>Possible nerve problem: diagnostic evaluation at JTC</td>
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</table>
Baby Sound Check™ Partners

- AltaMed Health Services Corporation
- South Central Family Health Center
- St. John’s Well Child and Family Center
- Venice Family Clinic
Equipment selection

• Needed to select units that were
  – Compact (hand-held, ideally)
  – User-friendly to non-audiologists
  – Reliable
  – Sturdy
  – Available for purchase (can’t be beta-testing!)
  – High-frequency tympanometry mandatory
  – Disposable vs re-usable tips
Location for testing

• Dedicated room vs. portable cart
• Some clinics did not have space to dedicate
• Needed to examine both setups
Dedicated Room
Initial in-service training

- Class One: General in-service for all staff
  - Orientation, info about hearing loss
- Class Two: Screener training (includes providers)
  - How to screen, troubleshooting equipment
- Class Three: Provider training (general)
  - Interpretation of test results
- Class Four: Training for pediatricians
  - Syndromes and appropriate referrals
General Inservice

Big rooms…

Or small…
Screener training
Provider inservice

• **SCHEDULING**: Getting everyone together at the same time was the biggest challenge!
• One hour isn’t enough time
• Forget assumptions about prior knowledge
Kickoff, May 2007

• First child successfully screened

• Press Event

• Luncheon
Challenges

• First providers trained were reluctant to implement the program routinely
  – felt that they lacked the competency to interpret the results

• Became apparent that providers needed to be able to understand *and perform* the screening procedure themselves
  – added two inservices to their training schedule
Additional Sessions Added

• Team training
• Screener training divided into two sessions:
  – Otoacoustic Emissions
  – Tympanometry
• Additional “Hands-on” session added in clinic
• Total of three 1-hour sessions for MAs
• Still not enough hands-on
How to provide enough practical experience?

- Two hours of classroom training isn’t sufficient
- Screeners need more practice before doing initial screenings in clinic
  - Comfort with equipment
  - Screening efficacy
- When to do competency evaluations?
New Training Schedule

- All-staff meeting (60 minutes)
- Classroom Lecture and Demo at clinic
  - Two sessions, 90 min each topic
- Provider Lecture at clinic (60 min)
- MA Hands-on Training
  - 3 MAs per session
  - Provided at community childcare sites
- Provider Hands-on Training at JTC
  - 5 providers, 3.5 hours per session
- MA Competency evaluation
Challenges

• After initial training, medical teams often weren’t able to practice enough to become competent before they started screening in the clinic.

• First providers trained were reluctant to implement the program routinely
  – felt that they lacked the competency to interpret the results

• Additional training sessions added; more time away from seeing patients
MA Competency Training

• MA will accompany audiometrist to local childcare center; 100 children screened per session (3 MAs at a time)
• MA will receive provisional certification
• Each MA to keep log of patients screened
• Will receive final certification once a certain number of screenings have been done in the clinic
# Baby Sound Check

Competency Criteria for All Personnel Performing Hearing Screening

Outpatient Hearing Screening Providers shall incorporate the following competency criteria into their evaluation and monitoring of individuals performing hearing screening.

Individual skills shall include the ability to:

<table>
<thead>
<tr>
<th>Task</th>
<th>Performed Task</th>
<th>Needed Training</th>
<th>Not Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Prepare the environment to perform the hearing screening:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Ensures appropriate test situation with regard to ambient noise.</td>
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</tr>
<tr>
<td><strong>2. Perform the hearing screening:</strong></td>
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</tr>
<tr>
<td>a. Assesses child for quiet state.</td>
<td></td>
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<tr>
<td>b. Positions child correctly.</td>
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<tr>
<td>c. Inserts probe correctly—pulls ear up and out, probe remains without support and obtains good probe fit.</td>
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<tr>
<td>d. Operates hearing screening equipment accurately.</td>
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<tr>
<td>e. Completes hearing screening with a valid test result.</td>
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<tr>
<td>f. Removes and disposes of test items appropriately and returns equipment to secure storage area.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>3. Perform infection control and risk management:</strong></td>
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</tr>
<tr>
<td>b. Washes hands before and after handling each child.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Clears and disposes of equipment per office policy and protocol after each use.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. Collect and record test data following hearing screening:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Enters/records child information accurately.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Collects and reports screening results according to office protocol.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>5. Communicate knowledge of the Hearing Screening:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Explains importance of hearing screening.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Explains hearing screening procedure.</td>
<td></td>
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</tr>
</tbody>
</table>

Screener’s Name ___________________________ Evaluator ____________ / Date ___________
Provider Competency Training

• Providers spend a day at JTC
  – observing screenings as well as getting practice with the screening equipment
  – interpretation of test results
  – provision of results to parents

• Will be evaluated at end of day for readiness to supervise screenings at clinic sites
Implementation:
Key issues to address

• Training
• Patient Flow
• Clinic Productivity/ Cost
• Quality Assurance
• Data Management
• Immediate Access to Specialty Care
Patient checks in

Consent

MA determines need for HS

Yes

Periodicity Table

OAE, TM, +/- AR
Parent Questionnaire

Questionnaire
### Baby Sound Check Periodicity Table

#### Periodicity Table

<table>
<thead>
<tr>
<th>Age</th>
<th>0-4 mos</th>
<th>5-8 mos</th>
<th>9-12 mos</th>
<th>13-24 mos</th>
<th>25-36 mos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval Until next exam</td>
<td>6 months</td>
<td>6 months</td>
<td>12 months</td>
<td>12 months</td>
<td>12 months</td>
</tr>
<tr>
<td>Date Tested/Initials</td>
<td>Date: ____________________________</td>
<td>Date: ____________________________</td>
<td>Date: ____________________________</td>
<td>Date: ____________________________</td>
<td>Date: ____________________________</td>
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<td>Date: ____________________________</td>
<td>Date: ____________________________</td>
<td>Date: ____________________________</td>
</tr>
<tr>
<td>OAE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tymp</td>
<td>High Frequency</td>
<td>High/Low Frequency</td>
<td>Low Frequency</td>
<td>High Frequency</td>
<td>High Frequency</td>
</tr>
<tr>
<td>Acoustic Reflex</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Patient checks in

Consent

MA determines need for HS

Yes

OAE, TM, +/- AR
Parent Questionnaire

Periodicity Table

Questionnaire
## Baby Sound Check
### Initial Visit

**BIRTH HISTORY**

1. Hospital of Birth: __________________ Birth Weight: ______________
2. Was baby born full-term? □ Yes □ No If not, how many weeks early? __________
3. Did the mother have any infections during pregnancy or at the time of birth? □ Yes □ No
4. Did the baby have any infections? □ Yes □ No
5. Were there any complications (check all that apply):
   - Needed to be under lights □ Yes □ No
   - Needed Oxygen □ Yes □ No
   - Needed blood transfusion □ Yes □ No
   - Needed antibiotics □ Yes □ No
   - Needed a feeding tube □ Yes □ No
6. Other problems during pregnancy or birth: __________________________________
7. How long was the baby in the Hospital after birth? ____________________________
8. Did the baby stay in the NICU? □ Yes □ No If so, how long? ___________________

### HEARING HISTORY

1. Did the baby get a hearing screening? □ Yes □ No
   - If so, what was the result? ___________________ Was there follow up? __________

### MEDICAL HISTORY

1. How many ear infections have there been since birth? ________________________
2. Has the child ever had to see a specialist for the ears? □ Yes □ No
3. Are you concerned that your child can't talk clearly? □ Yes □ No
4. Are you concerned that your child doesn't say many words? □ Yes □ No
5. Are you concerned that your child can't hear well? □ Yes □ No
6. Are there any other medical problems that you have concerns about or that the child has needed a specialist for? □ Yes □ No
7. Is your child developing normally?
   - Doesn't play well with other kids □ Yes □ No
   - Poor balance □ Yes □ No
   - Poor attention □ Yes □ No
   - Tantrums □ Yes □ No
8. Other physical or socialization concerns: ____________________________________

### FAMILY HISTORY

1. Any relative with hearing loss? □ Yes □ No
2. Any relative with problems with balance? □ Yes □ No

---

**RECENT MEDICAL HISTORY**

1. How many ear infections has your child had in the past year? ___________________
2. Has the child ever had to see a specialist for the ears? □ Yes □ No
3. Are you concerned that your child can't talk clearly? □ Yes □ No
4. Are you concerned that your child doesn't say many words? □ Yes □ No
5. Are you concerned that your child can't hear well? □ Yes □ No
6. Are there any other medical problems you have concerns about or that the child has needed to see a specialist for? □ Yes □ No
7. Has there been a change in your child's development recently? □ Yes □ No
8. Is your child developing normally?
   - Doesn't play well with other kids □ Yes □ No
   - Poor balance □ Yes □ No
   - Poor attention □ Yes □ No
   - Tantrums □ Yes □ No
9. Other physical or socialization concerns: ____________________________________

### FAMILY HISTORY (Discovered since last visit)

1. Any relative with hearing loss? □ Yes □ No
2. Any relative with problems with balance? □ Yes □ No

---

**PA-C Signature:** ____________________________ **Name:** ____________________________

**M.D. Signature:** ____________________________ **DOB:** __________ **Med. Rec#:** __________

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Patient Prepped Ready for MD

MD completes WCC & reviews HS results

Vaccines; labs MD makes appropriate Referrals and f/u

Results Sheet

Pocket Guide
Circle all that apply:

1. Normal eardrum mobility and normal middle ear pressure
2. Reduced mobility, normal pressure
3. Normal mobility, negative pressure
4. Abnormal mobility and pressure

All DPOAE greater than -5 R L
All DPOAE less than -5 R L
Pass in high frequencies only R L
Pass in low frequencies only R L
Acoustic reflex present? R L
HEARING SCREENING RESULTS

Circle a response for each ear:

1. Normal tympanic membrane and middle ear pressure
2. Normal mobility, negative pressure
3. Abnormal mobility and pressure (no peak)
4. Unable to test

Coding: Pass(1) Refer(2) No test(3)

Acoustic Reflex R Pass Refer Unable to test
Acoustic Reflex L Pass Refer Unable to test
OAE R Pass Refer Unable to test
OAE L Pass Refer Unable to test

Screener: [Signature]
Date of Test: 5-21-07
HEARING SCREENING RESULTS

**Normal** eardrum mobility: compliance greater than 0.3

**Flat**: Abnormal eardrum mobility (compliance less than 0.3 or no peak)

**Negative** middle ear pressure: more negative than -100, with presence of peak

**Incomplete**: Could not complete test

---

**HEARING SCREENING RESULTS (0-3 years old)**

<table>
<thead>
<tr>
<th>Tympanometry</th>
<th>Left Ear</th>
<th>Right Ear</th>
</tr>
</thead>
<tbody>
<tr>
<td>925671</td>
<td>Normal</td>
<td>925675</td>
</tr>
<tr>
<td>925672</td>
<td>Negative</td>
<td>925676</td>
</tr>
<tr>
<td>925673</td>
<td>Flat</td>
<td>925677</td>
</tr>
<tr>
<td>925674</td>
<td>Incomplete</td>
<td>925678</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reflex</th>
<th>Left Ear</th>
<th>Right Ear</th>
</tr>
</thead>
<tbody>
<tr>
<td>925681</td>
<td>Present</td>
<td>925684</td>
</tr>
<tr>
<td>925682</td>
<td>Absent</td>
<td>925685</td>
</tr>
<tr>
<td>925683</td>
<td>Incomplete</td>
<td>925686</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OAE</th>
<th>Left Ear</th>
<th>Right Ear</th>
</tr>
</thead>
<tbody>
<tr>
<td>925671</td>
<td>Pass</td>
<td>925674</td>
</tr>
<tr>
<td>925672</td>
<td>Refer</td>
<td>925675</td>
</tr>
<tr>
<td>925673</td>
<td>Incomplete</td>
<td>925678</td>
</tr>
</tbody>
</table>

Screener: __________________________

Date of Test: ______________________

Parent’s Name: ____________________

Parent’s Best Phone #: (____) _______
HEARING SCREENING RESULTS

Normal
compliance: greater than 0.3
pressure: more positive than "-100"
(ex: -75, -50, 0, +25, etc)

Flat
compliance: less than 0.3, or no peak
pressure: not relevant

Negative
compliance: greater than 0.3
pressure: more negative than "-100"
(ex: -110, -150, etc)

Incomplete: Could not complete test

Medical Assistants:
# of screenings: __________

Total minutes to screen:
__________ minutes

Reason for Screening:
○ Routine Baby Sound Check Screening
○ Other:
(Concerned for Speech Delay, Previous screening failed, etc.)

<table>
<thead>
<tr>
<th>HEARING SCREENING RESULTS (6-3 years old)</th>
<th>Right Ear</th>
<th>Left Ear</th>
</tr>
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<tr>
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<td>925673</td>
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<tr>
<td>Referrals</td>
<td>ENT</td>
<td>Otologyogy</td>
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<tr>
<td></td>
<td>JTC</td>
<td>John Tracy</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Screener: _____________________________

Date of Test: ________________________

Parent’s Name: ______________________

Parent’s Best Phone #: (___) _______
Patient Prepped
Ready for MD

MD completes WCC & reviews HS results

Results Sheet

Vaccines; labs
MD makes appropriate
Referrals and f/u

Pocket Guide
Physician Pocket Guide

Early Identification
• Diagram of ear
• Interpretation of results
• Degrees of Hearing Loss
• Follow-up/ referrals for various outcomes

Confirmed Hearing Loss
• Step-wise approach to search for etiology
• Referrals
• Monitoring development
# Possible outcomes

<table>
<thead>
<tr>
<th>Possible nerve problem: diagnostic evaluation at JTC</th>
<th>Middle ear problem: see physician and re-screen</th>
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<tr>
<td>Possible outcomes</td>
<td>Periodic screening</td>
</tr>
<tr>
<td>Refer OAEs and tympanometry</td>
<td>Refer OAEs and tympanometry</td>
</tr>
<tr>
<td>Pass OAEs and tympanometry</td>
<td>Possible cochlear problem: diagnostic evaluation at JTC</td>
</tr>
<tr>
<td>Pass OAE and tympanometry, refer reflexes</td>
<td>Possible nerve problem: diagnostic evaluation at JTC</td>
</tr>
</tbody>
</table>
Search for an Etiology: Stepwise Approach

1. History/ PE
   FHx of hearing loss, NICU for > 5 days, syndromic, CF anomalies

2. Genetic Testing
   Most common cause of hearing loss
   Connexin 26

3. CT Temporal Bones
   Mondini Dysplasia, enlarged vestibular aqueduct

4. Other
   EKG, UA, renal U/S, MRI temporal bones, Cx 30
Referrals

• ALL patients with hearing loss:
  – Audiology, early intervention, speech tx
  – ENT
  – Ophthalmology (annually)
  – Genetics
Our work up

Child with Confirmed Hearing Loss

Audiology
EI/ Speech
ENT; Ophtho

Known Cause (syndrome, hyperbili)

Work up per individual disease process

Unknown Cause

Connexin 26/ Genetics
CT Temporal Bones
EKG; Renal; Cx30
Patient with confirmed Hearing Loss…Now what?

1. Ensure audiology/ early intervention follow up
2. Monitor OME (effusions makes things worse)
3. Monitor for developmental problems (30-40% have assoc delays)
Patient with confirmed Hearing Loss…Now what?

4. Give pneumococcal and HiB vaccines if planned for cochlear implants
5. Screen all siblings for hearing
6. Search for an etiology….
7. Refer to specialists….
High Risk Patients: Need Audiology Eval

1. Caregiver concern
2. FHx permanent HL
3. NICU >5 days
4. ECMO, intubated, ototoxic meds, diuretics, hyperbili needing XT
5. TORCH infection
6. CF anomalies, including all ear deformities
7. Syndromes assoc with HL
8. Neurodegenerative d/o (Charcot-Marie Tooth, Friedreich ataxia, Hunter)
9. Culture (+) infections assoc with SNHL, including bacterial or viral (HSV, VZV) meningitis
10. Head trauma with basal skull/ temporal bone fx
11. Chemotherapy
Pruebas auditivas para su bebé

Resultados:

Tímpano D  Norm  Neg  No pico  No se pudo hacer

Tímpano I  Norm  Neg  No pico  No se pudo hacer

Reflejo D  Pasó  Referir  No se pudo hacer

Reflejo I  Pasó  Referir  No se pudo hacer

EOA D  Pasó  Referir  No se pudo hacer

EOA I  Pasó  Referir  No se pudo hacer

Recomendaciones:

____  Re-evaluar en ______ mes(es)

____  Llamar a la clínica John Tracy para una evaluación completa

Teléfono al que le podemos llamar: ________

______________________________

Teléfono altern:______________________
Clinic productivity

• Impact still unclear; many variables
  – Room availability
  – Staffing
• So far, no clear difference has been noticed in numbers of patients seen per day
• Adapting model to different clinic needs
  – Ex: WCC vs separate hearing screening clinic
Cost

- Equipment
- Training of staff and providers
- Staff time to perform screens
- Billing varies based on insurance type
  - Medicaid
  - Private
Quality Assurance

• Multiple training sessions
• Competency exams prior to first screening
• Physician Pocket Guide
• Baby Sound Check site champions at each clinic
• Close contact with John Tracy Clinic
• Periodic chart audits by the John Tracy Clinic
Data Management

Far more time and effort were required than anticipated to develop forms:

– that allow data to be saved in charts
– that allow data to be entered into MegaWest, the data entry and tracking system
– Change to electronic medical records
– Brochures for parents
– Questionnaires for research
Summary of Challenges

• Development of training protocols
• Scheduling training sessions
• Maintaining efficient patient flow
• Minimizing cost
• Quality assurance
• Development of forms, questionnaires, brochure
• Data management and tracking
• Immediate access to audiology
Successes

• Articulating the fundamental need and purpose of the program
• Generating strong interest on the part of the community clinics and the community at large
• Over 150 children screened at 6-month mark
Successes:
Physicians are on board

- Increases education/knowledge in terms of hearing health
- Primary provider/ coordinator for screening & preventative care
- Provides an easy opportunity to re-screen in cases where the NBHS is not available
- Facilitates relationship with local audiology
Public Information

• Article in *California Pediatrician*, Oct 2007

**Pediatric Hearing Screening in the Medical Home: A Model Program**

Christine Gilmore Eubanks, PhD; Barbara F. Hecht, PhD

Deafness is the most common disability present at birth. In the United States, approximately one in 300 infants is born with permanent hearing loss. We have long known that diagnosis in early infancy and intervention within the first few months of life can prevent the tragic consequences of limited communication, low school achievement and life-long dependency that can result from delayed detection of childhood deafness (Yoshinaga-Itano, 1995). Additionally, diagnosing these children early can trigger a closer look at medical conditions sometimes linked with deafness, such as heart arrhythmia and vision and kidney problems. Indeed, researchers in the field agree that no group has more to gain from early identification than children with hearing loss (Joint Committee on Infant Hearing, 2000).

Until the last few years, the average age of diagnosis for hearing loss was 30 months. Advances in technology have now made it feasible to screen babies at birth using objective physiologic measures, and Newborn Hearing Screening Programs of the country at the percentage of newborns screened, has recently passed legislation (AB 2651) to try to address this gap. However, follow-up, including re-screening, comprehensive diagnosis and timely entry into early intervention programs, has proven to be a major hurdle throughout the nation. In some states, up to 50% of infants who fail their hospital screening are lost to follow-up (White, 2005), a situation that disproportionately affects low-income and chronically underserved families.

Upcoming article in ASHA newsletter
By End of Year One

- JTC will incorporate infant-toddler hearing screening in five AltaMed sites that provide well-baby care:
  - Commerce
  - Bell
  - Boyle Heights
  - Pico Rivera
  - El Monte
Year One

• Develop and test
  – training materials
  – forms and charting
  – protocols
  – tracking systems
  – reimbursement mechanisms

• Evaluate in different settings under one umbrella organization
Year Two and beyond

• Replication of the program at sites in other CCALAC community clinic organizations
Year Two
(dates approximate)

- January-February 2008
  - Venice Family Clinic
  - Scheduling, forms, logistics
  - Training to start by March
- April 2008
  - South Central Family Health Center
- July 2008
  - St. John’s Well Child and Family Center
Fine tuning and continuity of *Baby Sound Check* program

- Continued assessment of in-service and additional staff training needs
- Data analysis and evaluation
- Development of replication and expansion plan
Expectation by Year 5

• Hearing screening will be a well-established, smoothly operating component of well-baby care at the 10 clinic sites
• Result: coordinated, preventive hearing health care for 20,000 infants and toddlers
Expectation by Year 5

• Annual, periodic screening will be in place
• Capacity for immediate screening of hearing and middle ear function for children with
  – Speech delay
  – Developmental delay
  – Recurrent middle ear infections
Roles & Responsibilities

• Program Director
  – Develop and administer training program
  – Supervision of screening and diagnostics
  – Data collection, analysis and program evaluation
  – Outreach to community healthcare partners
  – Dissemination of model

• Administration
  – Advocate, support project as a priority
  – Assist with logistics and dissemination
Roles & Responsibilities (clinics)

• Medical Assistants
  – Perform hearing screenings

• Physicians
  – Present results of screenings, make referrals for further audiological or medical evaluations

• Clinic Support Staff
  – coordinate training and screening logistics, billing, and data collection/transmission to JTC.
Roles & Responsibilities (JTC)

• Pediatric Audiologists and Counselors
  – Diagnostic testing, counseling and referrals to Early Intervention professionals

• Parent-Infant teachers
  – Coordinate follow-up (with audiologists)

• Audiology Assistants/Audiometrists
  – Assist with screener training on-site
  – Make appointments with families
  – Bilingual staff assist with translation
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