TeleAudiology: A Key to Early Identification of Hearing Loss

TeleAudiology Learning Community

Salt Lake

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TeleAudiology?

Help meet EHDI 1-3-6 goals?
Improve loss to follow-up rates in the EHDI process?

Is TeleAudiology possible in a clinical setting?
Solution?

Marshfield Clinic TeleHealth!

Dedicated TeleHealth Department with Supporting Infrastructure

- Established in 1997
- Based in operational clinical approaches
- Not Technology oriented
- Providing over 40 different specialty services
- Experienced TeleHealth Nurse Clinicians
Marshfield Clinic
Rural Wisconsin
Geography: Marshfield Clinic
Audiology Locations

- Chippewa Falls
- Eau Claire
- Marshfield
- Menomonie
- Merrill
- Minocqua
- Park Falls
- Rice Lake
- Spooner
- Stanley
- Wausau
- Weston
- Wisconsin Rapids
Audiology In-person Sites prior to Grant Funding

- Marshfield
- Chippewa Falls
- Eau Claire

Problem: Travel to these 3 locations may exceed 2-3 hours one way!
Audiology In-person Sites After Grant Funding

- Marshfield
- Chippewa Falls
- Eau Claire
- Wausau
- Weston
- Merrill
- Wisconsin Rapids

Locations with In-person Pediatric Diagnostic ABR
Audiology In-person and TeleHealth Sites

- Marshfield
- Chippewa Falls
- Eau Claire
- Wausau
- Weston
- Merrill
- Wisconsin Rapids
- Minocqua
- Rice Lake
- Rhinelander
- Park Falls

Locations with In-person & TeleHealth Pediatric Diagnostic ABR
Electronic Health Record

CattailsMD

Wireless Tablets for Patient Care
Think big, start small

With Wisconsin Sound Beginnings:

– Data Analysis
– Key locations to develop onsite and TeleAudiology services.
  • Loss to follow-up rates
  • Geographic access to services
Hire a Care Coordinator

• Track babies at high risk for loss to follow-up
• Promote WSB EHDI Quality Improvement Bundles
• Support and promote TeleAudiology
• Coordinate Pediatric Hearing Loss Clinic
Audiology Equipment
Equipment Cases
Supplies
Crossloop

- Software that allows remote access of ABR computer
- 128-bit encryption algorithm
- Randomly generated 12-digit access code for each session
Crossloop Video
VNC Remote Access

Remote Computer Access

Wired Laptop Computer Connections
Real VNC Access
User Authentication

Requires user name and password – set up to use network log in credentials
Naming of Sites
After log-in...

• Audiologist clicks on VNC icon
• Audiologist selects name of site from drop down menu (showing ip address)
• Audiologist clicks on “connect”
Server security controls are in place to disallow connections to the computer destination if not authorized by server or authentication credentials.
VNC Remote Access

- VNC Enterprise System for Windows
- Runs as a stand-alone product
- Purchased License
- Local installation on computing device
- Server based application for connections
- Requires user name and password
- Complies with Security Rules (HIPAA)
The patient site is a designated clinical exam room enabled for TeleHealth

- Polycom© VSX7000s codec technologies
- Audiologist uses the pc-based H.323 video system provider workstation
  - Polycom PVX Software only codec with Logitech 9000 camera and pc speakers
  - Includes remote control access of the exam room camera.
Technical Specifications

- **H.323 video equipment**
  - Runs on 10-100 meg fiber network, using standards based video.

- **Uses IP (Internet Protocol)**
  - 512 kbps over proprietary fiber optic cable leased from two Local Exchange Carriers.
MC TeleHealth Approach to Care Delivery

- Sessions are real-time interactive

- All calls are considered patient consultations and are treated as such for HIPAA and HITECH requirements.
• Authored by TeleHealth Director and TeleHealth Nurse Project Coordinator in consultation with Audiology
• Available on the Marshfield Clinic Intranet for easy access
Procedure Information Includes:

- Pre-consult preparation of infant
- Equipment set-up
- Skin & ear preparation
- Electrode placement
- Infant positioning
- Post-consultation considerations
3. PROCEDURE BODY

All clinical staff responsible for the presenting of patients to Audiology Services or any provider who may need a component of audiology services shall be proficient in providing audiology data via TeleHealth technologies.

All clinical staff responsible for the presenting of patients to Audiology Services or any provider who may need a component of audiology history or physical exam shall be appropriately trained.

3.1. Pre-Consult Preparation:
- Prepare equipment to include the Navigator Pro box, Biologic software, bone oscillator, otoscope, and connection to Crossloop.
- Frame patient so Audiologist can see the infant while testing is taking place.
- A quiet infant is imperative for proper testing.
- Assist parent(s) as needed to keep the infant settled.

3.2. Biologic/Navigator Pro equipment set-up:
- The Navigator Pro box is colored coded to assure proper connections.
- Plug USB cable into the laptop with the Biologic Software.
- Assure the earphones are plugged into the Navigator Pro box.
- There is no ON/OFF button. The Navigator Pro automatically turns on when plugged into the computer.
- The diagram below shows placement only. Please disregard the color scheme.
- The Navigator Pro is color coded as follows: Power cord is orange, USB is yellow, and insert earphones are pink.

- Position the infant so the left ear is exposed. Complete testing on the left ear (tube transducer). Settle infant as needed.

3.9. Bone Conduction ABR: Test only done at provider’s discretion:
- Plug oscillator into the Navigator Pro.
- Firmly hold the oscillator to the infant’s mastoid with 1 index finger. Push the oscillator on the mastoid until you could almost push the child’s head away from you.
- Make sure the oscillator is not touching the pinna.
- Never use 2 fingers to hold the oscillator as this can dampen the output.
- The provider will adjust settings and complete the testing.

3.10. Testing complete:
- Remove electrodes.
- Remove and discard foam tip. Careful not to discard black tube socket.
- Disconnect the Navigator Pro box from infant and computer.
- Audiologist will discuss results with family.

3.11. Post-consultation Considerations:
- Reframe infant and parent(s) so the provider has good eye contact with family for follow up discussion.
- When testing is complete, the Audiologist will verbalize when to shut down the computer.
  - Go to the start menu.
  - Select turn off computer.
Training of TeleHealth Nurse Clinicians

- Prepared In House Video
- Video Conference Presentation
- Individual one on one consultation before “go live” date
- + From:

Newborn Hearing Screening Training Curriculum
Competency-based Training for New Hearing Screeners
Training of TeleHealth Nurses

Audiology participation in TeleHealth Skills Day
• For babies who refer on the hearing screen, the goal is to schedule two appointments prior to hospital discharge

• 2 weeks and 4 weeks of age

Program Components
If opportunity doesn’t knock, build a door.

Milton Berle
Audiology Appointment Request

It is recommended that follow-up appointments be made before discharge from the hospital or within 1 week of the final hearing screening. Schedule a 2-week evaluation, as well as a 4-week evaluation at the selected facility below.

Bab['s name ___________________________ DOB ___________________________

Final hearing screening results – Right: [ ] Pass [ ] Refer Left: [ ] Pass [ ] Refer

Guide By Your Side information offered to parent: [ ] Yes [ ] No [ ] Unknown

Primary care provider (required) ___________________________

Parent['s phone number: Home ___________________________ Cell ___________________________

Contact the following with the 2-week and 4-week follow-up appointment information:

<table>
<thead>
<tr>
<th>Parents</th>
<th>Birth unit</th>
<th>Midwife</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone</td>
<td>Phone</td>
<td>Phone</td>
</tr>
</tbody>
</table>

Check [ ] parent['s preferred location for follow-up appointments:

<table>
<thead>
<tr>
<th>Marshfield Center</th>
<th>Minocqua Center (telehealth)</th>
<th>Rhinelander Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merrill Center</td>
<td>Wausau Center</td>
<td>Weston Center</td>
</tr>
<tr>
<td>Chippewa Falls Center</td>
<td></td>
<td>Eau Claire Center</td>
</tr>
</tbody>
</table>

Fax 715-389-7622
Or call directly at 1-800-273-5245

Fax 715-847-3257
Or call directly at 715-847-3232

Fax 715-726-4224
Or call directly at 1-888-206-9112, ext. 3-4160

Fax 715-885-4505
Or call directly at 715-885-4747

Any questions or concerns about Early Hearing Detection & Intervention (EHDI), call EHDI Care Coordinator at 1-800-782-8581, ext. 1-7128.

Comments __________________________________________________________

__________________________________________________________

__________________________________________________________

Additional ABR testing sites:

[ ] ENT Professional Associates
  Ashland 715-682-9311

[ ] Ministry Medical Group-Rice Clinic
  Stevens Point 715-342-2749

Guide By Your Side®

PCP required

Insurance Info

Program Components
### TeleAudiology Scheduling

#### Patient Q Test (1818358) Male 56 years DOB=06/10/1954 - Patient Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Provider</th>
<th>Appt Type</th>
<th>Comment</th>
<th>Add'l Prv</th>
<th>Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 15, 2011, Wed</td>
<td>08:45</td>
<td>Microsens Telehealth Room (90564)</td>
<td>NOTE (90)</td>
<td></td>
<td></td>
<td>Monocles</td>
</tr>
<tr>
<td>08:45</td>
<td></td>
<td>Microsens Telehealth Room (90564)</td>
<td>NOTE (90)</td>
<td></td>
<td></td>
<td>Monocles</td>
</tr>
<tr>
<td>08:45</td>
<td></td>
<td>Antinolli, Nina PhD (50520)</td>
<td>NOTE (90)</td>
<td>pre-time</td>
<td></td>
<td>Monocles</td>
</tr>
<tr>
<td>09:00</td>
<td></td>
<td>Antinolli, Nina PhD (50520)</td>
<td>TMFT (429)</td>
<td>2 week failed newborn screening</td>
<td>Yes</td>
<td>Monocles</td>
</tr>
<tr>
<td>09:00</td>
<td></td>
<td>Sce, Cynthia Aud COCCA (59175)</td>
<td>TMFT (429)</td>
<td>2 week failed newborn screening</td>
<td>Yes</td>
<td>Monocles</td>
</tr>
<tr>
<td>09:00</td>
<td></td>
<td>Microsens Telehealth Room (90564)</td>
<td>NOTE (90)</td>
<td></td>
<td></td>
<td>Monocles</td>
</tr>
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For Help, press F1
Preparing your baby for a hearing test

Your baby is scheduled for hearing test as a follow-up to initial screening at the hospital. This comprehensive evaluation will help diagnose any hearing loss. It's important to begin intervention services early so your child can develop key social and communication skills.

These suggestions will help you prepare your baby for the hearing test. This is an hour-long appointment.

- Testing is easiest when babies are full, sleepy and feeling well. We recommend feeding your baby about 20 minutes before the hearing test. A full tummy will help your baby feel calm and more likely to sleep.
- Testing may be done if your baby is awake. Bring along a blanket to decrease restlessness.
- Dress both of you comfortably.
- Testing works best in a quiet environment. If siblings or small children accompany you to this appointment, please bring another caretaker to watch them in the waiting area. Your baby may need your full attention during the test.
- If your baby has a cold or is not well, reschedule the hearing test. To reschedule, call 1-800-273-5245 or 715-387-5371.

It is not always possible to finish a hearing test in one appointment. If a second appointment is required, we will schedule it as soon as possible.

Marshfield Clinic
Don't just live. Shine.
- Designed as a center to center program rather than a strict hub & spoke concept.

- Audiologist controls the laptop and software remotely and analyzes results in real time.
TeleAudiology Program Value-Steps

- Parents are provided results the same as if they were on site.
- The audiologist prints results prior to disconnection of equipment for formal report.
- Results are scanned into electronic medical record.
TeleAudiology Data:
Sep 14, 2010 – Apr 30, 2012 (19 months)

- 4 Locations: Minocqua, Rice Lake, Park Falls, Rhinelander
- Infants scheduled: 36
- Passed initial appointment: 28 (78%)
- Average age: 32 days
- Age Range: 2 weeks – 6 months
TeleAudiology Data:
Sep 14, 2010 – Nov 30, 2011

Required 2nd appointment: 8 (22%)

• Need further testing: 2 (9%)
• No Show: 3 (11%)

*Equipment issue: 3 (9%)
TeleAudiology Data
Final Results (19 months, n=36)

- Final Passed: 31
- Cond HL: 1
- Refused f/u: 2
- Lost to f/u: 2
Economic Impact:

- Travel prior to grant: 105 miles average
- TeleHealth Site: 25 miles average
- Cost savings based on $3/mile formula calculation
- Round trip distance saved = 160 miles
- $480 average dollar savings
Financial Considerations

TeleHealth & New Onsite Locations:

- **WI Medicaid**: 42 (Onsite), 17 (TeleHealth), 23 (Eval Onsite/TeleHealth), 3 (Lost to F/U)
- **Private Insurance**: 18 (Onsite), 7 (TeleHealth), 1 (Eval Onsite/TeleHealth), 1 (Lost to F/U)
- **No Insurance**: 5 (Onsite), 1 (TeleHealth), 1 (Eval Onsite/TeleHealth), 1 (Lost to F/U)

Legend:
- Onsite n=59
- TeleHealth n=36
- Eval Onsite/TeleHealth Closer
- Lost to F/U Onsite/TH Closer
• BG Normal pregnancy, C-section delivery
• Referred newborn hearing screen, bilaterally
• History of multiple no-show & cancelled TeleAudiology appointments
• Moved twice since birth
• Returned to original PCP

Case Study TeleAudiology
Case Study continued

TeleAudiology Results, 5 months old:

- Passed OAE screen left ear
- Referred OAE screen right ear
- Initial ABR recording hard to interpret secondary to awake state
- Mom fed & snuggled baby and was able to get baby to sleep
ABR results

- Normal ABR left ear
- ABR 40 dB right ear, with significantly delayed latencies noted, suspect conductive hearing loss
- Contacted local Audiologist & PCP
- Scheduled for coordinated appointments at 6 months of age
Quotes

- TeleHealth Nurse Clinicians
- Parents
We’re not done yet!

Future TeleHealth Sites

- Arcadia
- Eagle River
- Hayward
- Ladysmith
- Mercer
- Mosinee
- Osseo
- Phillips
- Wittenberg

+ More to be considered as project moves forward
So Can TeleAudiology?

- Help meet EHDI 1-3-6 goals? **Yes!**
- Improve loss to follow-up rates in the EHDI process? **Yes!**
- Finally, is TeleAudiology possible in a clinical setting? **Yes!**
Muchos Gracias! Merci-Merci!

• Dr. Elizabeth Seeliger and Wisconsin Sound Beginnings for the vision behind this project.
• Dr. Nina Antoniotti TeleHealth Director for her insight and expertise in development of a TeleHealth program.
• Karen Wegerer RN EHDI Care Coordinator for going above and beyond to seek resources and overcome hurdles.
No One Knows what Lies Ahead!
Thank you!
Cindy See, AuD
Nina Antoniotti, RN, MBA, PhD