TeleAudiology

Taking Diagnostic to the Infant

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HRSA Contract # HSH240200865003C
Purpose and Objectives

- Contract with HRSA
- Develop protocols to complete audiology diagnostics with infants 0-6 months of age using the internet
- Deliverables
  - Management Protocol
  - Technical Protocol
  - Tool Kit
Basis for this project

- Limited number of pediatric audiologists
- Huge distance between professional and baby
- Too many babies are lost to follow up
- Cultural differences
- Technology currently exists
- The process is proven
  - 2003-05 NDCPD/MSU study
How is this done?

- Hub and Spoke concept
- Utilizing existing telemedicine system
- Using existing audiology diagnostic equipment that is Windows based
- Using existing software
Determine the Need

- Evaluate current services
  - Number and location of pediatric audiologists
  - Where is the LTF coming from?
  - Distance/travel time/weather issues
  - How far is too far to travel?
- Proposed service area
  - Population to be served
Organizational Readiness

✓ Stakeholders

- Champion(s)
- Administration
- End-users (parents & babies)
- Supporting personnel
Organizational Readiness

✓ Resources
  • Funding
  • Staff
  • Competing initiatives

✓ SWOT Analysis
  • Strengths
  • Weaknesses
  • Opportunities
  • Threats
Facility/Site Assessment

✓ Administrative
✓ Technical
  ▪ Technology needs
  ▪ Network infrastructure
  ▪ Staff support and training
  ▪ Quality of service
  ▪ Maintenance
Clinical Work Flow Analysis

✓ Staffing
✓ Facility/service line support
  ▪ Scheduling
✓ Equipment needs
Program Implementation

✓ Administration
  ▪ Business model
    • Contracts or MOA
    • Network membership
    • Administrative oversight
    • HIPAA
    • Licensure/credentialing
    • Liability insurance
Technical Considerations

- Installation
  - Network
  - Endpoint
  - Peripherials
- Testing
  - Connectivity
  - Process
Clinical Considerations

✓ Clinical protocols
  ▪ Role specific
  ▪ Contact information
  ▪ Consents
✓ Support personnel
  ▪ Training
  ▪ Process testing
Technical Considerations/Steps:
Development of a TeleAudiology practice
Thinking of TeleAudiology?

✓ Equipment required NOT terribly complex
  ▪ Use existing Audiology analyzers (if computer based)
  ▪ Telehealth (communications) technology readily available

✓ The complexities exist in set-up/system design
  ▪ Many variables in potential environments (network, bandwidth, compatibilities, etc.)
  ▪ Hardware and software options are extensive
  ▪ Communication field is constantly evolving
  ▪ Critical to involve good CS and/or Network consultation
  ▪ Needs assessment
Break down into:

- Costs
- Connectivity
- Hardware
- Software
- Security
Cost

1) Environment (where you chose to practice)
   ✓ Location (fees and options vary geographically)
   ✓ Network Set-up
     • Type of Connectivity {public, VPN, private}
     • “Isolated Practice” to “Shared”

2) Tools (equipment, etc)
   ✓ Up-front costs could range from 1K to 30K+
Costs

✓ Initial (start-up)
  ▪ Telehealth hardware and software (hub and spoke)
  ▪ Analytic equipment (spoke)
    • Key: equipment with computer interface (vs a stand-alone system)
  ▪ Other up-front costs

✓ On-going (consumables/expenses)
  ▪ Network costs (Example – monthly fee to ISP)
  ▪ Software costs (“on-going” if a “lease” situation)
    (Examples – monthly and/or per-site fee for browser-based software solutions / encryption)
  ▪ Maintenance, staff, continuing education, etc.
Connectivity (types)

- Independent Private Network
- Virtual Private Network (VPN)
- Public Internet
- Satellite
Connectivity (issues)

✓ Common complication: Connecting uncommon sites/work between or among different networks

✓ Bandwidth (The amount of data that can be transmitted in a fixed amount of time)

✓ Data rate Variables

✓ Quality of Service (QOS)
Hardware

✓ Desktop computer solutions
  - Tower or laptop (PC or MAC)
  - Camera
  - Microphone & speakers
    • Headset
    • Echo-cancelling mic/speaker combo
    • or Both

✓ Videoconferencing solutions
  - Hardware-based with proprietary software
Software

✓ Making your Choice

✓ Requires both "videoconferencing" and "desktop-sharing/collaboration"

Can be accomplished with:

• two separate software solutions or
• one solution that provides both

TeleAudiology is fairly unique

KEY: Desktop Sharing

(HUB needs to take control of the SPOKE desktop/and still see their desktop)
Software: Considerations can be daunting

- Point-to-Point vs. Multipoint
- Proprietary vs. Standards-based
- Self-managed bridging vs. hosted bridging
- Browser-based vs. stand-alone
- By protocol (i.e., H.323, SIP)
HIPPA (Health Insurance Portability Act – 1996)

Objective:

“Protect the Security and Privacy of transmitted INDIVIDUALLY IDENTIFIABLE Health Information“

Key: Will “individually identifiable” information be transmitted?
Two Scenarios

1. No personally identifiable information transmitted (no “additional” HIPAA ramifications)

2. If so, options are:
   • Maintain totally private network
   • Employ encryption

Notes:
- Compliance interpretation can be vague
- Ask yourself: (by using Telehealth)
  “Am I transmitting any personally identifiable information?”
  “Have I added anything that could jeopardize security?”
Frequently Asked Questions

✓ What will it cost?
✓ What equipment do we need?
✓ Where do we get it?
✓ How do we comply with HIPAA?
✓ Why wouldn’t you just use “EasyShare” at all times?
   (compatibility issues with other protocols such as H.323/Polycom, etc.)
I’m Done

• Feel free to contact me with questions, for more information.

• 1-800-233-1737 (ext 3505)
Empirical Evidence


Need for Tele-Audiology Approach

- Joint committee on Infant Hearing Position Statement 2007
  - Follow-up of screening failures by 1 month of age. Target group for tele-audiology
  - Auditory Diagnostics completed by 3 months of age.
  - Amplification and intervention by 6 months of age.
  - North Dakota has only 4 pediatric diagnostic centers in the state.
  - Travel up to 200 miles (one way) to pediatric center

- Some areas of the state have a 40% to 50% loss to follow-up.
Instrumentation Located at Spoke Site

- Intelligent Hearing Systems
  Auditory Brainstem Evoked Response Unit
  - All disposables
    (i.e. electrodes, probe tips for insert earphones, etc.)

- Laptop Computer
Instrumentation at Hub Site

Desk Top Computer with dual screen capability

Dual screen allows the video to be observed on one screen and the test results on the other.

(we use 17” and 19” monitors)
ABR Test Protocol

✓ Follows the JCIH position 2007 statement:
  - Air conduction frequency specific tone bursts.
  - Bone conduction tone bursts (if required)
  - Click evoked ABR using condensation and rarefaction stimuli if there are risk indictors for neural hearing loss (auditory neuropathy/auditory dyssynchrony)
  - Recording montage: What ever the audiologist is comfortable with.
The Paraprofessional at the Spoke Site

✓ Requires intensive training in:
  - Importance of testing environment.
  - ABR and computer function/hook-up/troubleshooting.
  - Electrode site preparation/application
  - Function of Pre-Amplifier
  - Checking electrode impedance
  - Use of insert earphones
  - Video conferencing software
Once the spoke and hub site are in audio and video contact, the spoke site will relinquish control of their computer to the hub site.

The audiologist now controls the ABR test protocols, using the spokes computer.

ABR testing procedures continue as if the patient was in the audiologist’s office.
Test Results:

✓ Results of the ABR are stored on the Spoke Computer.
✓ Records can be accessed, interpreted and a report generated from the Hub following the assessment as long as the Spoke grants computer control.
✓ No patient records are stored on the Hub computer.
Discussion of Test Results

1. Inform parent via the headset/speaker.

2. Inform parent a report will follow.

3. Refer to a pediatric audiology center for further testing without informing parents of test results.

4. Method must be determined when network established.