

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

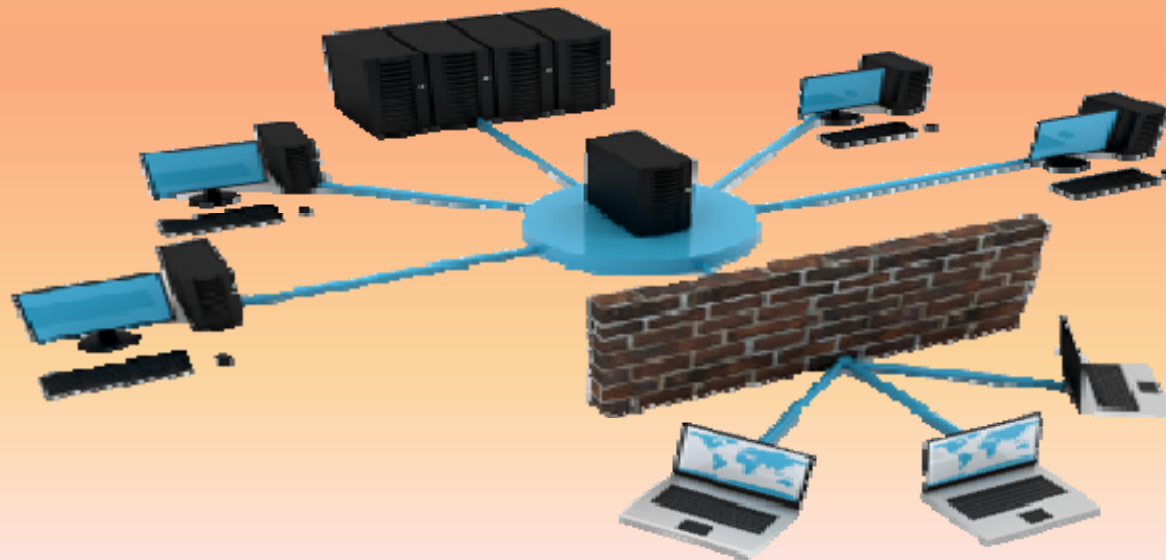
Facility/Site Assessment

- ✓ 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



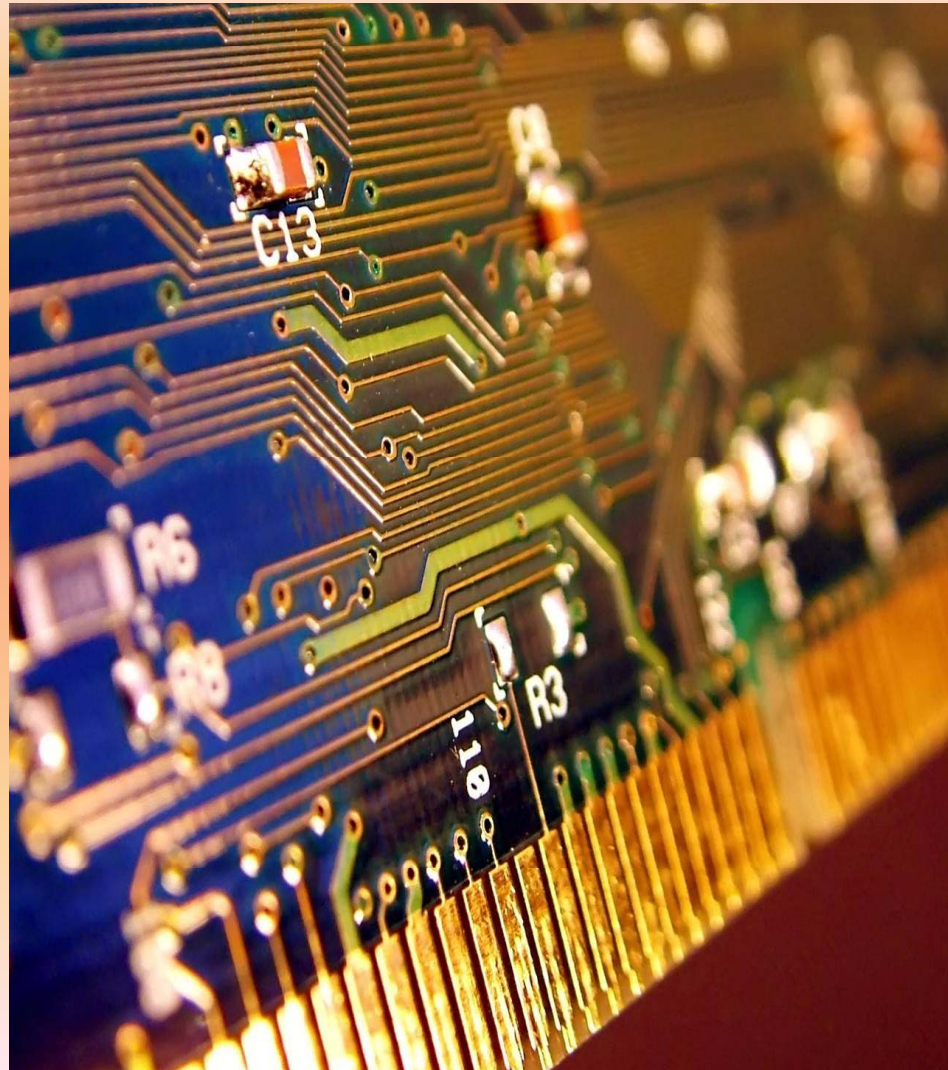
Program Implementation

- ✓ Administration
 - Business model
 - Contracts or MOA
 - Network membership
 - Administrative oversight
 - HIPAA
 - Licensure/credentialing
 - Liability insurance



Technical Considerations

- ✓ Installation
 - Network
 - Endpoint
 - Peripherals
- ✓ Testing
 - Connectivity
 - Process



Clinical Considerations

- ✓ Clinical protocols
 - Role specific
 - Contact information
 - Consents
- ✓ Support personnel
 - Training
 - Process testing



Steve Peterson, MT(ASCP)



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)



Security



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

- Melga, C. Pure Tone Threshold Testing using Telemedicine Technology: Unpublished Master's Thesis, Minot State University ,2000
- Winsor, T. Validating Distortion Product Otoacoustic Emissions using Telehealth Technology. Unpublished Master's Thesis, Minot State University, 2001.
- Towers, A., Pisa, J., Froelich, T., Krumm, M. The Reliability of Click-Evoked and Frequency-Specific Auditory Brainstem Response Testing Using Telehealth Technology. Seminars in Hearing, Vol. 26, Feb. 2005

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)

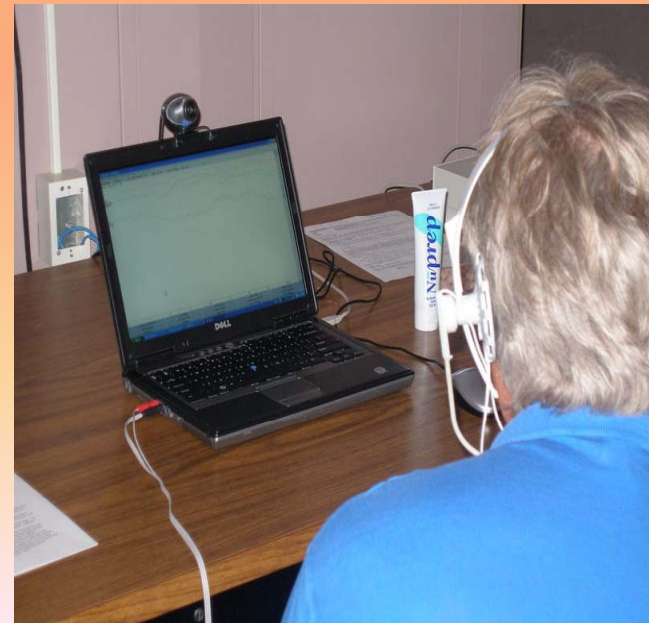
ABR Test Protocol

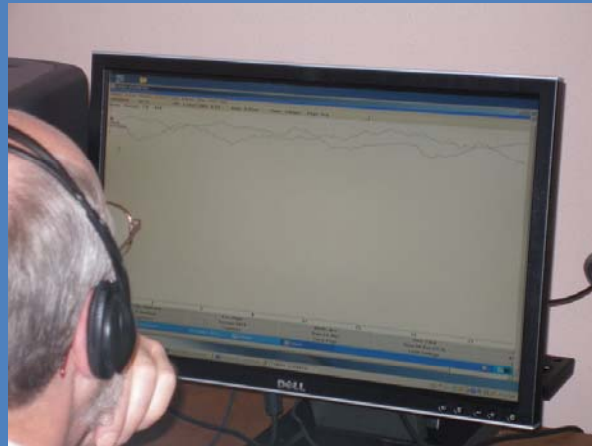


- ✓ Follows the JCIH position 2007 statement:
 - Air conduction frequency specific tone bursts.
 - Bone conduction tone bursts (if required)
 - Click evoked ABR using condensation and rarefaction stimuli if there are risk indicators for neural hearing loss (auditory neuropathy/auditory dyssynchrony)
 - 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

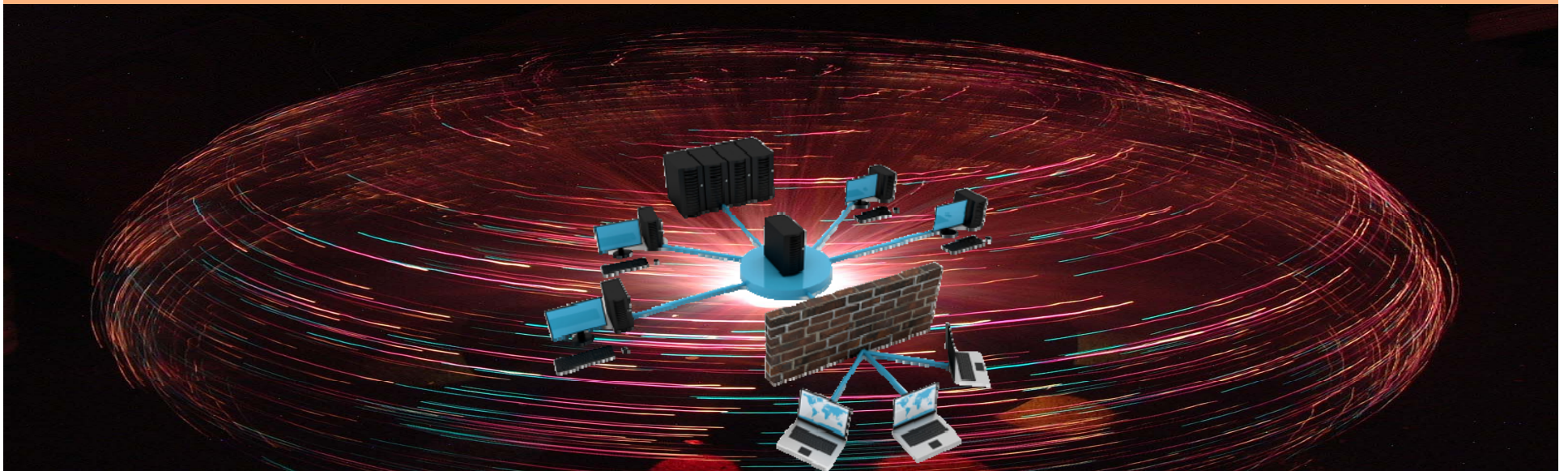




- ✓ Once the spoke and hub site are in audio and video contact, the spoke site will relinquish control of their computer to the hub site.
- ✓ The audiologist now controls the ABR test protocols, using the spokes computer.
- ✓ ABR testing procedures continue as if the patient was in the audiologist 's 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

