The Role of Tele-audiology in Supporting Access to Care

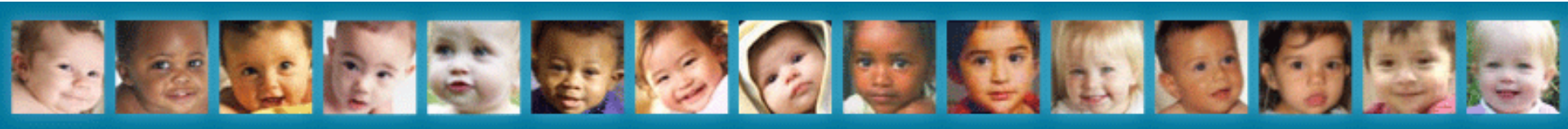EHDI Meeting
April 16, 2013
Glendale, AZ

Diane Behl, NCHAM

Anne Marie Tharpe, Vanderbilt University
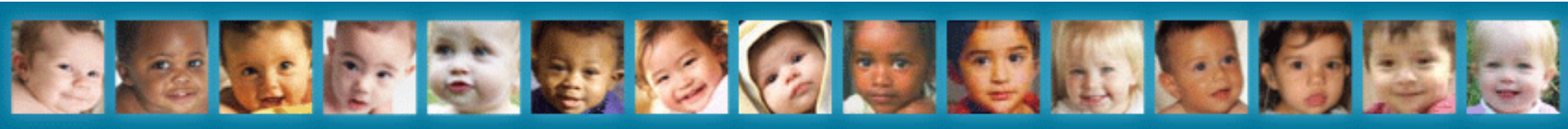
Deborah Hayes, Children's Hospital Colorado

Vicki Hunting, Iowa EHDI program

Role of Tele-audiology in EHDI

- Increased access to diagnostic evaluations = reducing loss to follow up

- Include interpreters and cultural brokers = Support culturally competent services

- Provide remote hearing aid management, CI procedures = timely intervention
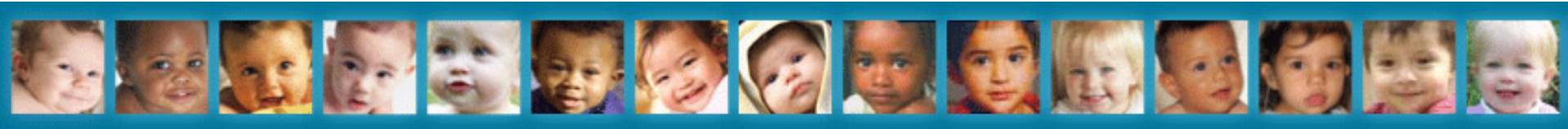
Learning Community Purpose: Share, Expand, Create

Organizational/political processes
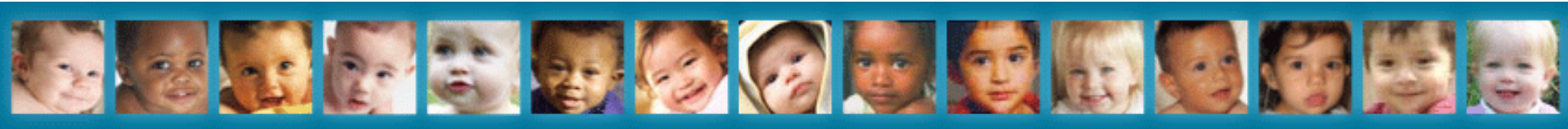
Technology nuts & bolts

Interpersonal procedures

NCHAM
National Center for Hearing Assessment and Management
Utah State University™

Learning Community Members

- California
- Canada
- Colorado
- Iowa
- Tennessee
- Wisconsin
- Utah

Key Factors

- Building partnerships, laying groundwork

- Ensuring secure, high-quality service delivery

- Family-centered services

- Reimbursement

- Resources

Tele-Audiology in Guam

Improving Access to Care from 7,000 Miles Away!

Deborah Hayes, Ph.D.
University of Colorado School of Medicine
Children's Hospital Colorado

National EHDI Conference
April 16, 2013

HAFA ADAI!
GUAM: A FEW FACTS

- U.S. Territory acquired in 1898 following the Spanish-American War
- Native people are Chamorro from Asian Pacific region
- Japanese occupation during World War II; re-captured by the U.S. in 1944
- U.S. military presence with Naval and Air Force Bases
- Semi-tropical island about 30 miles x 8 miles in size
- Civilian population of 170,000
- Birthrate for 3,300 infants/year

"Fiber Optic Flower" on a Beachfront Tree

Purpose of this Presentation

- Describe why tele-audiology for infant diagnostic audiological evaluations (DAE) was considered for the Guam EHDI program
- Enumerate steps in the process of launching a tele-audiology practice in infant DAEs
- Identify issues specific to the practice of tele-audiology
- Discuss personnel, hardware, and software requirements for our project
- Describe test results to date
- Summarize challenges and solutions in tele-audiology practice

Loss to Follow-up at DAE in Guam
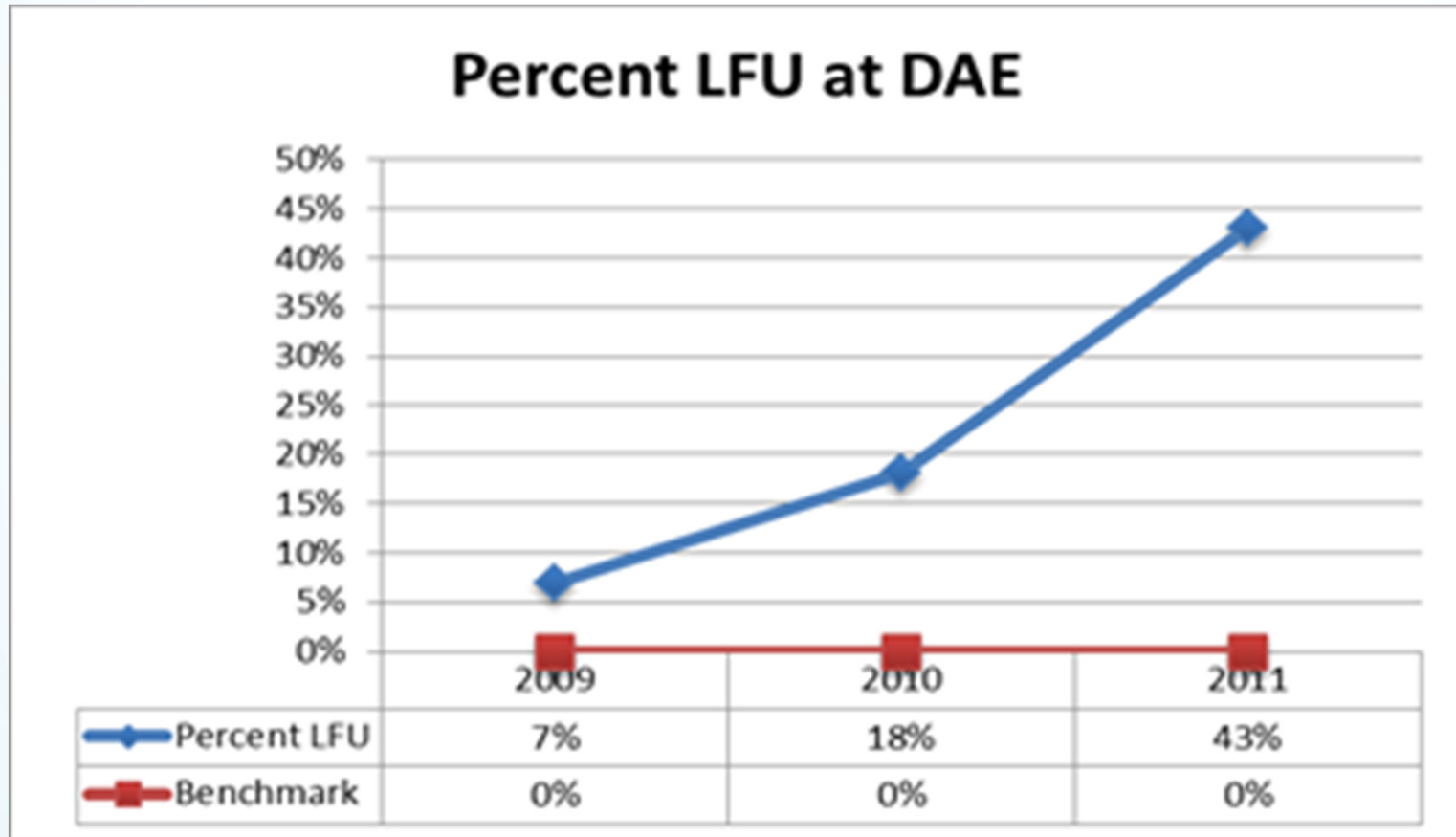
Slide courtesy of Elaine Eclavea, M.Ed., University of Guam

Issues in Completing Infant DAEs

Lack of Audiologist comfortable in testing newborns
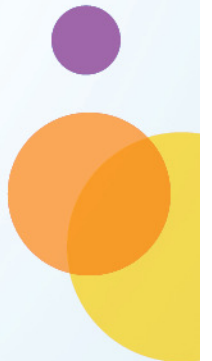
   Repeated AABR screens

Equipment

Parent refusal

   Process taking too long

Parents seeking testing off-island

Lack of enrollment into early intervention programs

Possible Solutions

Find an audiologist on island or within the Pacific region

>> No university training program in Guam

>> On-island audiologists fully committed with job responsibilities, unavailable to civilian population, or not well-experienced in infant DAEs

"Transient" audiologist who could fly to Guam several times/year for testing

Option of tele-audiology
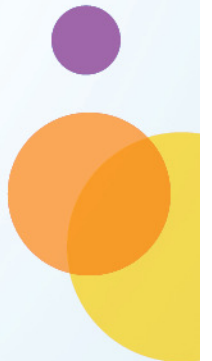
Tele-audiology for Infant DAE

Providing infant DAEs over the internet emerged from a presentation and subsequent discussion with EHDI coordinators from the Pacific Rim including Guam, Palau, Federated States of Micronesia, Saipan, and Commonwealth of Northern Mariana Islands at EHDI Meeting (2010)

Guam was selected as the pilot site because

- Sufficient birthrate to ensure enough babies to test the concept
- Availability of organized screening and early intervention programs
- Adequacy of internet and travel services to facilitate communication and interaction
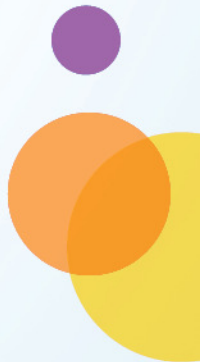
Steps in the Project

Developing of a Memorandum of Understanding outlining each party's responsibilities

Visiting site of tele-audiology in Guam by Children's Hospital Colorado staff

- Evaluate test environment and equipment
- Train Guam-based technicians (DOE audiometrists)
- Develop procedures jointly

Acquiring Guam audiology licensure

Identifying HIPAA-compliant software for remote control of Guam diagnostic audiometric equipment and videoconferencing

Testing/retesting software solutions

Ensuring a successful first tele-audiology test

- Scheduling a Children's Colorado audiologist on Guam for "Go Live"
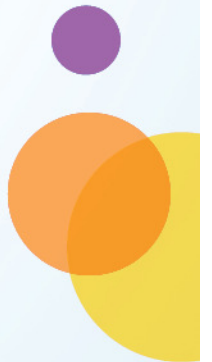
Issues in Tele-audiology Practice

Professional licensing

   Children's Colorado audiologists obtained a Guam audiology license prior to testing

Privacy and confidentiality

   Remote control software is approved as secure for testing over the internet by Children's Colorado; no infant identifying information is transmitted during testing

   Videoconferencing software encrypts audio and video transmission

Liability and malpractice

   Children's Colorado audiologists are covered by the hospital's liability insurance policy

   Informed consent is obtained from parents prior to testing
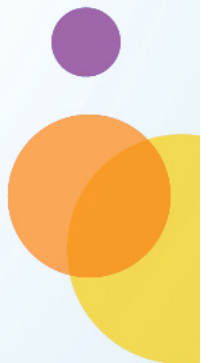
Personnel for Tele-audiology

In Colorado

Two licensed (Colorado and Guam) audiologists from Children's Hospital Colorado

Project leadership

Technical support

In Guam

Trained technicians (Guam DOE-Part B audiometrists)

Project leadership from Guam EHDI

Technical support

Guam Family Supporters from Guam Early Intervention Services (GEIS)

Technology for Tele-audiology

In Guam:

   Bio-logic® Navigator® PRO (NavPRO) for auditory brainstem response, otoacoustic emissions, auditory steady state response

   GSI TympStar and Interacoustics Titan for tympanometry and middle ear muscle reflexes

   Laptop for videoconferencing

In Colorado:

   Desktop PC for remote control operation of NavPRO

   Laptop for videoconferencing

Software for Tele-audiology

Netop Remote Control software for audiologist in Colorado to "take control" of Guam NavPRO

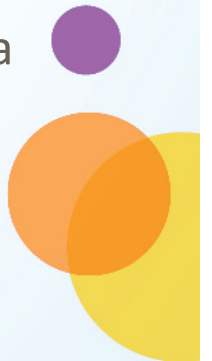- Colorado is "guest" and logs into Guam NavPRO through public IP address
- Guam is "host" and allows Colorado to take control of NavPRO
- No infant identifying information is transmitted during testing

Nefsis videoconferencing software

- Guam holds Nefsis videoconferencing license
- Colorado connects to videoconference established by Guam via secure website

First "Go Live" in Guam

A mother holds her infant during teleaudiology testing to determine whether or not her infant has a hearing loss. Technology enabled Dr. Ericka Schicke at Children's Hospital-Colorado to operate the diagnostic audiological equipment remotely from Colorado, after Bobbie Maguadog (left), Department of Education audiometrist, and Dr. Susan Dreith (center), audiologist, Children's Hospital-Colorado, prepared the parent and infant for testing on Guam. (Photo credit: University of Guam)

Tele-audiology Results to Date

XX test sessions completed to date (March 21, 2013)

- XX infants received complete diagnostic assessment; Xinfant received partial ABR but did not sleep for remaining tests
  - Otoscopy (by Guam audiometrist)
  - Tympanometry
  - Otoacoustic emissions
  - Auditory brainstem response (air and bone conduction as needed)
  - Auditory steady state response (air and bone conduction as needed)
- Diagnosis and recommendations provided to family by testing audiologist
- Formal report generated by testing audiologist for family and primary medical provider
- Audiological diagnosis facilitated referral for medical services for XX infants
- XX additional infants scheduled for April 2013

Challenges in Tele-audiology

Identifying an appropriate test environment

Identifying and training support personnel

Scheduling appointments across time zones (16 hour difference between Colorado and Guam)

Interruption of internet services during testing

Measuring effectiveness of family counseling delivered by videoconferencing

Integrating infant DAE services into full EHDI program to attain quality outcomes

Sustaining services beyond pilot phase
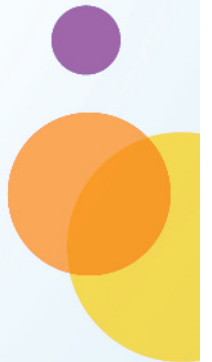
What We have Learned

Infant diagnostic audiological evaluations can be effectively provided over the internet

Site visit(s) is/are critical to success of tele-audiology

Software solutions must meet contemporary standards for infant and family privacy and confidentiality

Tele-audiology is optimally delivered within the context of comprehensive services for the infant or patient and family

Tele-audiology can be a successful approach for providing services in rural and remote communities
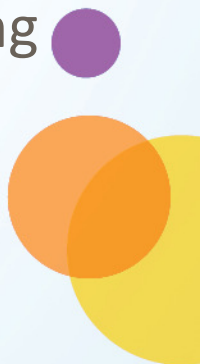
Tele-Audiology in Iowa

Vicki Hunting

Project Director, Improvement Advisor
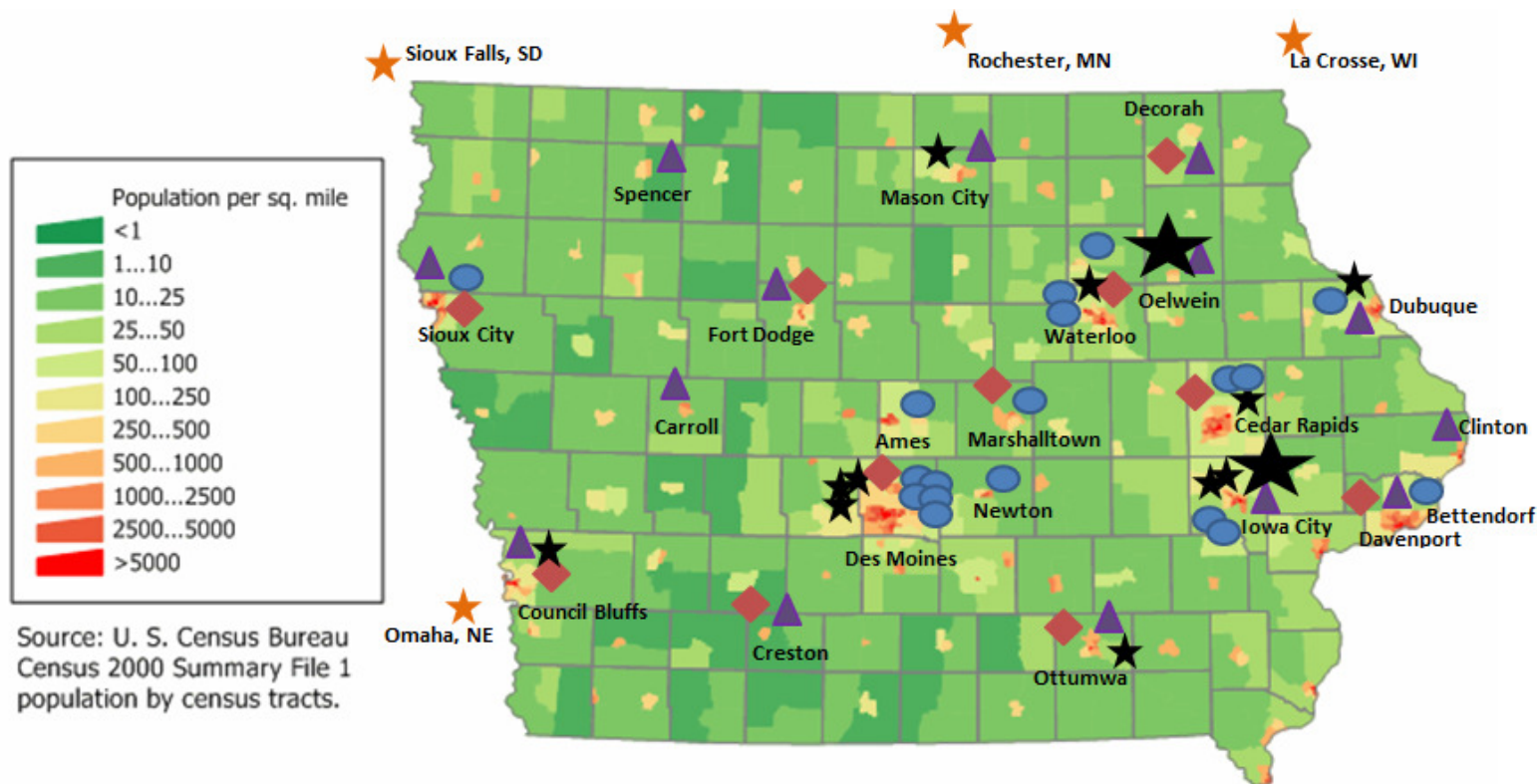
Child Health Specialty Clinics (CHSC)

Partnership to Improve Child Health in Iowa (PI CHI)

Early Hearing Detection & Intervention (EHDI)

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs

Iowa Demographics

Population per sq. mile
- <1
- 1...10
- 10...25
- 25...50
- 50...100
- 100...250
- 250...500
- 500...1000
- 1000...2500
- 2500...5000
- >5000

Source: U. S. Census Bureau Census 2000 Summary File 1 population by census tracts.

★ Out of State Audiology Centers
★ Iowa Audiology Centers   ★ Tele-Audiology Ctr
▲ Child Health Specialty Clinics Regional Centers
● Birthing Centers with ABR screeners
◆ Area Education Agency (AEA)

Sioux Falls, SD
Rochester, MN
La Crosse, WI
Decorah
Spencer
Mason City
Oelwein
Sioux City
Fort Dodge
Waterloo
Dubuque
Carroll
Cedar Rapids
Clinton
Ames
Marshalltown
Newton
Iowa City
Bettendorf
Davenport
Des Moines
Council Bluffs
Omaha, NE
Creston
Ottumwa

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs

Iowa EHDI

- **HRSA Grant** – University of Iowa, Department of Pediatrics, Child Health Specialty Clinics (CHSC)
  - Hands & Voices, Guide By Your Side (GBYS) for Family Support
  - Technical Assistance from Audiologists @ Center for Disabilities & Development (CDD), Iowa's University Center for Excellence in Developmental Disabilities (UCEDD)
  - Long Term Follow-up
- **CDC Grant** – Iowa Department of Public Health (IDPH)
  - Surveillance/Data
  - Relationship with birthing centers
  - Short Term Follow-up

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs

Set-up

- "*Hub* "in Iowa City @ CDD with Audiologists
- "*Spoke*" in Oelwein @ CHSC Regional Center (RC) with RN

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs
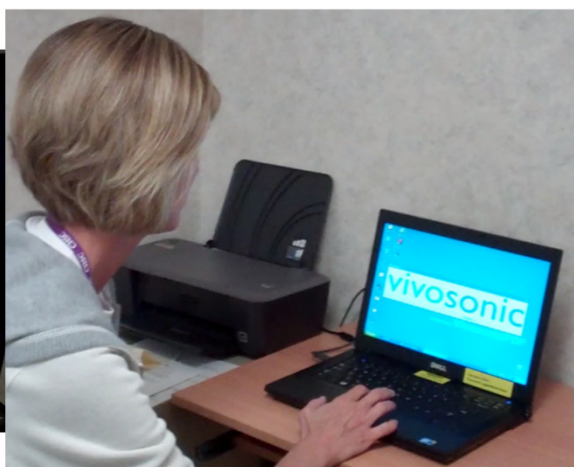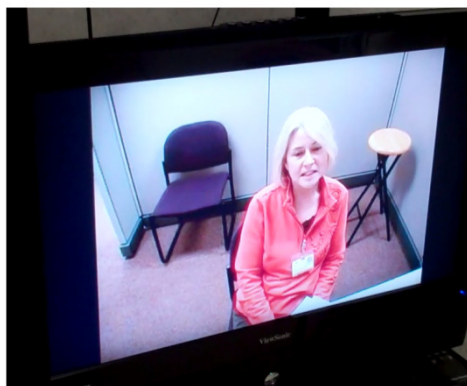
Equipment

- Vivosonic Integrity @ Spoke site (Oelwein)
- GoToAssist – Spoke & Hub (Iowa City/Oelwein)
- Polycom – Spoke & Hub (Iowa City/Oelwein)
- Hi Def flat screen monitor

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs

Iowa Process

1. Child <u>does not pass</u> 2nd screen (OP)
2. Proximity to CHSC Oelwein RC
3. Appointment is scheduled
4. Appointment attended
5. Test is complete
6. Results shared - on the spot
7. Next Steps/Referrals
8. Community Resources and additional services shared.
9. Results documented in state database & UIHC EMR
10. Follow-up

Audiological Services

Prior to the Appointment:

- Audiologist/RN meet discuss appt
- Configuration test, setup connections, ensure working order

During the Appointment:

- RN may repeat OAE screen if warranted
- RN Puts on electrodes
- Otoscopy @ Spoke
- Click thresholds
- Tone bursts thresholds
- Future: Include capacity for high frequency tymp

Community Services

- Oelwein Regional Center also employs Social Workers, Family Navigators, on site

- Access to Hands & Voices Guide By Your Side (GBYS) Parent and deaf/hard of hearing Guides

chsc

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs

What's Important to Families

Communication...Communication... Communication!!!!

- Knowing what to expect from this Tele-Audiology experience
- Communication during testing about what's happening
- Communicating with other professionals, their families about results
- Serving and understanding diverse cultures
- Records, results and counseling/family support
- What happens next
- Community supports and services available to them
- Out-of-pocket costs/Insurance

Assuring a System of Care for Iowa's Children and Youth with Special Health Care Needs

Reimbursement

Today

- Grant activity
- Everything is within University of Iowa Hospitals and Clinics (UIHC), Department of Pediatrics
- Family pays nothing (okay for now, low referrals)
- RN @ spoke site
  - nursing licensure board says this is within RN "scope of practice"

Future

- Challenge, reimbursement for tele-health in Iowa
- Arranging reimbursement from third party payers;
  - Medicaid, private insurers

Challenges

- Marketing

- Referrals

- Stable Bluetooth connections

- Third Party Reimbursement

- Sustainability

Contact Information

Vicki Hunting

515-331-0750

Vicki-hunting@uiowa.edu

Steps to Take:

1. Identify area(s) of need
2. Find project partners
3. Set goals
4. Operationalize process
5. Determine technical/equipment needs
6. Assess/re-assess

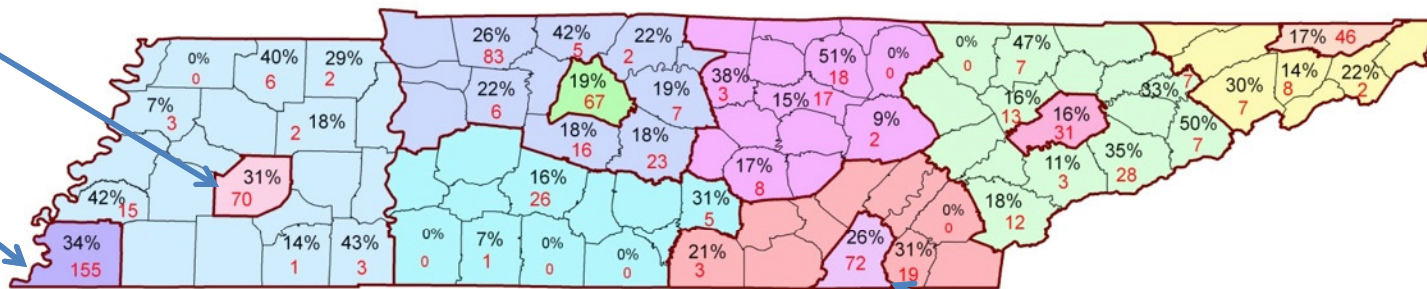# Examples from Vanderbilt

Identify Areas of Need

Tennessee Department of Health
Newborn Hearing Screening 2009
Lost to Hearing Follow-Up: Newborns with no follow-up after a "Referred" hearing screening
Number and Percent by County of Birthing Hospital

Find Project Partners

- Maternal Child Health Bureau (LEND)
- TN Department of Health
- LeBonheur Children's Hospital (Memphis)
- W. Tennessee School for the Deaf
- Methodist Hospital (Memphis)
- U Tennessee (Knoxville)
- East TN State U (Johnson City)

Set Goals

- Decrease family drive time (< 2.0 hours)

- Develop protocols

- Develop educational materials (families and physicians)

- Pilot in most needy area(s) first

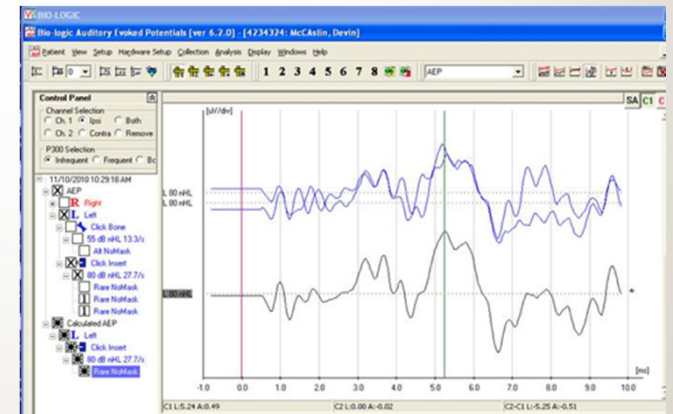- Reduction in loss to follow up(long term)

Remote Assessment

electrodes

earphones

Training of Support Staff

- Exporting expertise in electro-diagnostics to rural areas

  - Screenings in the NICU: 850 / year

  - Repeat screenings in clinic: 350 / year

  - Diagnostic ABRs: 250 / year

Procedures and Protocols

- Includes:
  - Establishing the link between the Host and remote site
  - Introduction of everyone present
  - Discussion of procedures with caregiver
  - Skin preparation of infant
  - Electrode and earphone placement
  - Electro-diagnostic evaluation
  - Counseling

Project II. Remote CI Programming and Intraoperative Monitoring
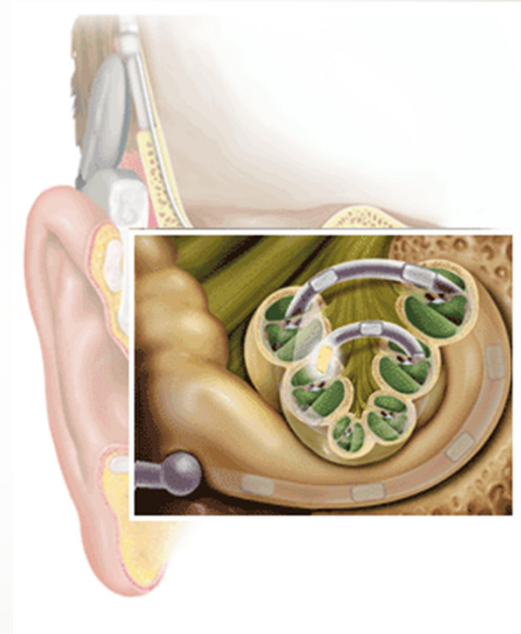
Identify Need:

- <u>Dozens</u> of CI programs in the U.S.
  - Handful of centers implanting > 100 implants/year
  - Even fewer centers implanting > 150 implants/year

- Largest, most experienced centers in large metropolitan areas

- Few options for patients with complicated mapping and management needs

Remote Intraoperative Monitoring of Device Integrity & eCAP Thresholds During CI Surgery

- Device integrity checks and intraoperative completion of eCAP threshold estimation

  - Requires "in person" equipment setup, initial device check, and verification of data connection

- Completed on the VUMC campus

  - "within the firewall"

- Communicate with surgical team via phone during testing

Remote Intraoperative Monitoring of Device Integrity & eCAP Thresholds During CI Surgery

Required items:

- Secure data connection

- Two computers

- Remote control software
  - DameWare (VBWC)
    - Others: LogMeIn, Windows RDC, TightVNC, UltraVNC, ScreenConnect, Team Viewer, Bomgar, etc.

Non-required items (unique for this application):

- Remote IT assistant

- Video connection

- Tested approximately 200 patients remotely to date

- Increased efficiency
    - OR presence = 2-3 hours
    - Remote presence = 26-39 minutes (depending on OR location)

- Increased clinician productivity
    - Audiologist is seeing clinic patients during surgery
    - Gets called out for total of 3 minutes to remotely test

- Downside
    - surgeons prefer a physical presence
    - Student training in the OR might be compromised

Project III: Distance Support for Hearing Aid Users

Set Goals:

To evaluate hearing aid software that would allow a clinician to provide follow-up care (i.e.. adjustments, counseling, reinstruction on hearing aid maintenance, etc.) remotely

Distance Support Study

- Patient Demographics
  - 22 Females; 31 Males

  - Age Range: 32-80 years

  - Average Mileage: 32.80 miles

  - Average Time to Clinic: 37.93 minutes

Distance Support Study

- Phase 1 Procedure:
  - wirelessly connect to Vanderbilt's internet
  - instruction manual provided to patients
  - patient installs software onto a clinic computer and sets up the necessary hearing aid programming device without assistance or with minimal assistance from the clinician
  - clinician goes to another room (down the hall), calls patient and talks with them while adjustments are made to the hearing aids

Distance Support Study

– Satisfaction surveys

- Patient
- Clinician

Distance Support Study

- Results:
  - 50 patients completed
  - Stable connectivity to patients
    - On a few occasions connectivity was lost usually due to insufficient battery current
  - Patients were able to install the software in 5-10 minutes
  - Patients felt installation process was relatively straight forward (only 2 unable to install)

VANDERBILT UNIVERSITY
MEDICAL CENTER

Distance Support Study

- Survey Results:
  - No clear profile of who was an appropriate distance support candidate
    - Majority of patients could install the software regardless of age
  - Patients often indicated preference for remote care even if geographically close to clinic
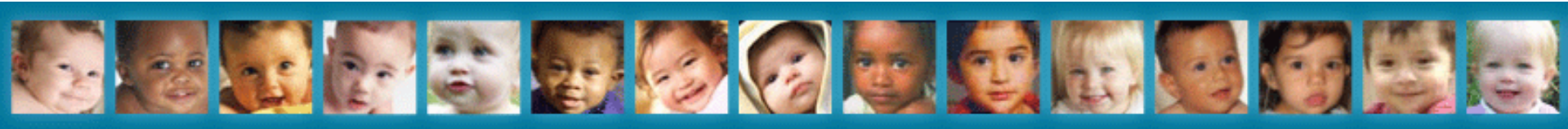
Challenges

Remaining Challenges

- Which model to adopt?
- Infrastructure and security
- What is the funds flow?
  - Who gets reimbursed?
  - Who invests in equipment?
- Re-engineering clinics to suit the model
- Patient acceptance/Clinician acceptance
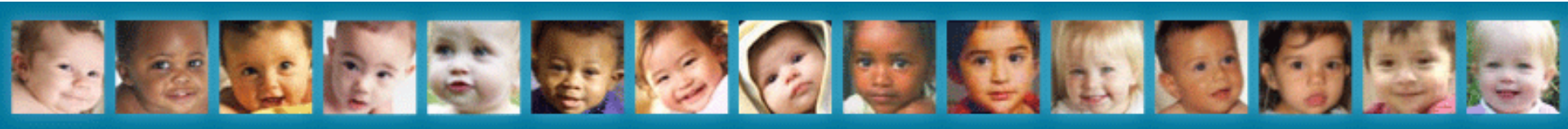- Student training

Thank you!

Maternal Child Health Bureau

LEND Training Program

Vanderbilt Telehealth Team

All of our partners
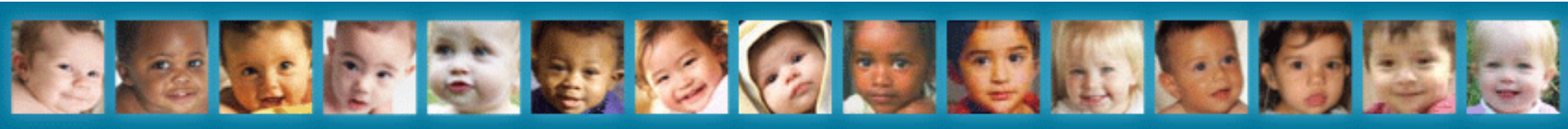
A Word About HIPAA Privacy and Security

- Same privacy rules in face-to-face apply to T-A

- Consider who else is present on the provider end and the client end

- Security applies to electronic transfer of information, primarily recordings

  - Encryption, limited provider access

- Risk Analysis

  - Cohn, Ellen (2011) Privacy and Internet-based Telepractice, *Perspectives on Telepractice.* Sept., v.1, no.1 p. 26-37
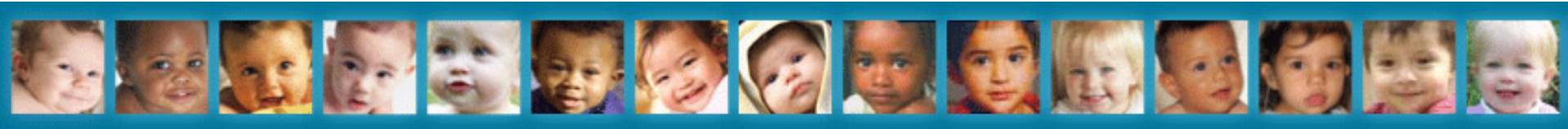
Reimbursement & Licensing

(National Telehealth Policy Resource Center, a program of the Center for Connected Health Policy; Feb. 2013)

- 44 states have some form of reimbursement for telehealth in their public program
  - Those that do not : CT, DC, IA, MA, NH, NJ, RI

- Proposed The Telehealth Promotion Act of 2012 (H.R. 6719) would require reimbursement of telehealth for any service covered face-to-face

Licensing

- To date, providers must be licensed in the state where the client is located

- DOD/VA providers need only be licensed in their home state to treat the military and veterans located anywhere

- Proposed The Telehealth Promotion Act of 2012 (H.R. 6719): Provider needs state license only in state where living, practice anywhere else

Essential Resources

- ASHA SIG 18: Telepractice

- American Telemedicine Association
  - *Submitted request to create Standards and Guidelines*

- NCHAM (infanthearing.org)
  - Tele-intervention Resource Guide
  - Telehealth
  - Tele-audiology coming soon

Telehealth
Resource Centers

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Expanding Our Reach »
Telehealth Resource Centers are located across the country.

TRC National Webinar Series

Every month the TRCs present a topic of current interest in telehealth. Join us on the third Thursday of every month.
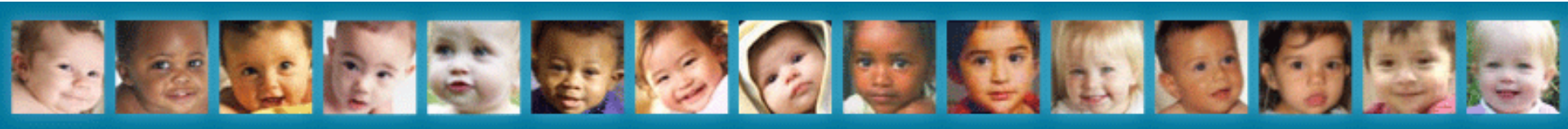
June 21, 2012: mHealth

Join us for our webinar series! 🔗

Click Here to View Past Webinars 🔗

Welcome To The Telehealth Resource Center Website!

The Telehealth Resource Centers (TRCs) serve as a focal point for advancing the effective use of telehealth. The TRCs are funded by the federal Office for the Advancement of Telehealth. There are 11 Regional TRCs and 1 Technology Assessment Center. We welcome you to visit all our individual websites.

Don't see your state? While each TRC has a primary service area, we are available to help anyone that requests assistance.

Questions? Comments?

Thank you!