

Case 1: Child Aged Birth through 5 – Rural Setting – SLP Focus – Hearing Impairment

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Audience Poll



Why the Need For Early Identification of Hearing Loss?

Early onset sensorineural hearing loss can interfere with the perception of speech.

Compromised speech perception impairs:

- Receptive and expressive speech and language development,
- Academic achievement, &
- Social and emotional development.

Untreated hearing loss affects:

- Income,
- Educational cost, &
- Family.

Universal Newborn Hearing Screening

North Carolina legislated and implemented an Early Hearing Detection and Intervention (EHDI) program in 2000.

In 2006, the percentage of NC newborns receiving hearing screening remained high (i.e., 98.2%).

- Williams et al. (2015)

Lost to follow-up (LFU)/lost to documentation (LTD) for diagnostic testing following the screening phase was very problematic!

- 53.7% ($N = 808$)

Can teleaudiology help?

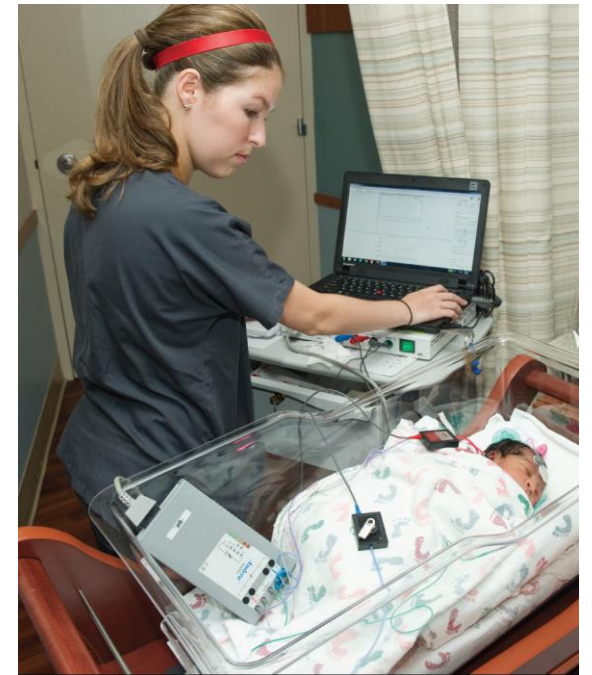


Patient With Need

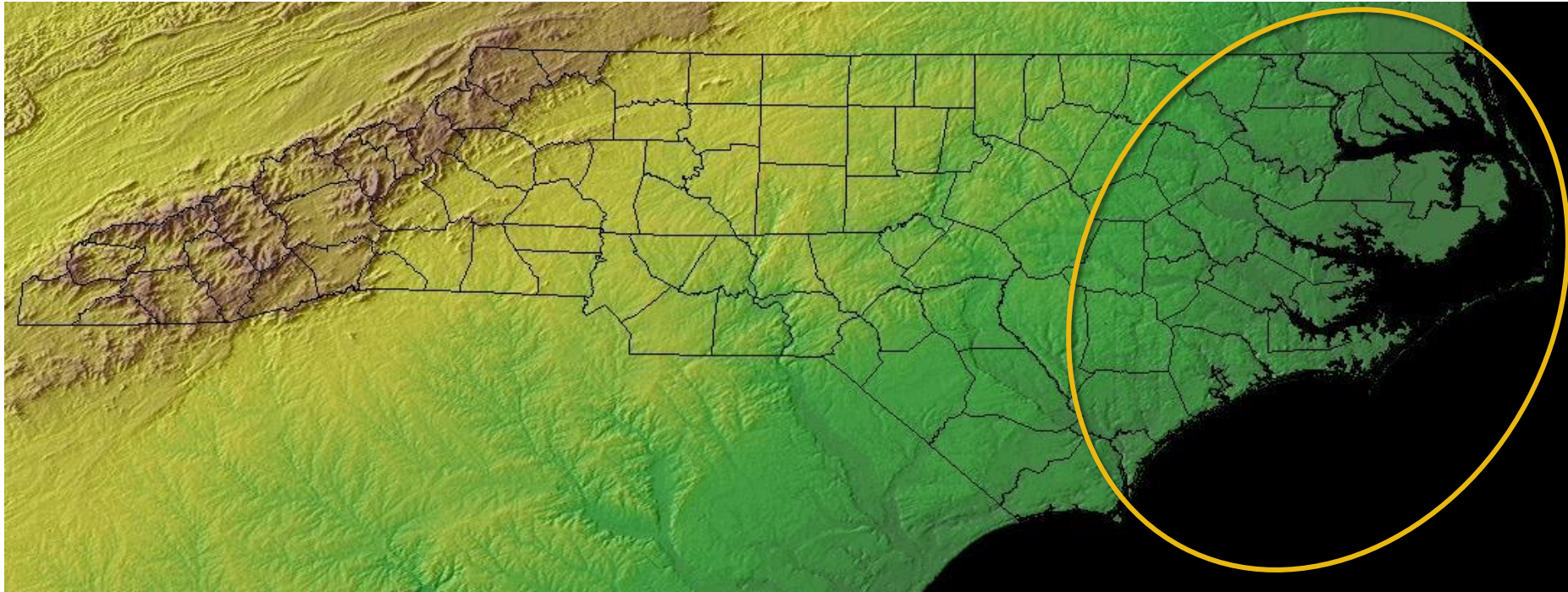
Photo: Balic Dalibor/Shutterstock



Audiologist With Services



Eastern North Carolina



http://www.learnnc.org/lp/media/uploads/2010/03/north_carolina_topographic.jpg

Catchment Area: Extremely rural, high % below poverty level, and infant diagnostic sites are not easily accessible.



<http://www.nc-climate.ncsu.edu/thrips/>



<http://www.city-data.com/picfiles/picv23021.php>



<http://www.outerbankschamber.com/>

So...

The NC Department of Health & Human Services (NCDHHS) received U.S. Department of Health and Human Services Health Resources and Services Administration (HRSA) “Lost to Follow-up” funding in September, 2009.

- A portion of funds were used to develop a pilot “Teleaudiology Project” to provide diagnostic evaluations for children from eastern NC.

The Players

North Carolina Department of Health & Human Services

- Division of Public Health, Children and Youth Branch, Early Hearing Detection and Intervention Branch (EHDI)

East Carolina University

- Telemedicine Center
- Department of Communication Sciences and Disorders (Audiology)

Project Goals

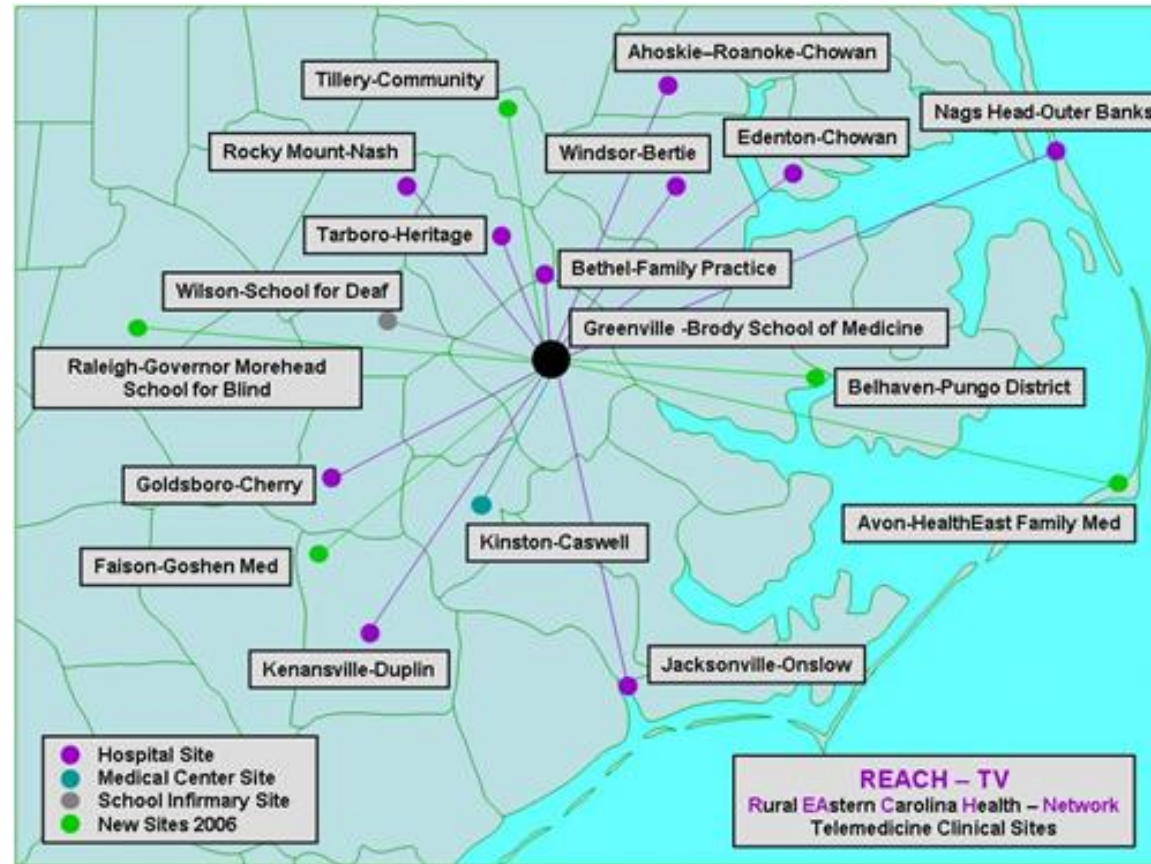
To provide infant diagnostic evaluations in rural eastern counties.

To establish a *coordinated* system for the delivery of audiological evaluations for infants whose families experience economic and geographic barriers to service:

- Decrease drive time to no more than 2 hours;
- Increase the number of children diagnosed by 3 month; &
- Decrease loss to follow up.

These objectives were in tune with the 1-3-6 Plan Joint Committee on Infant Hearing (2007) recommendation of providing comprehensive audiological evaluations no later than three months of age.

Remote ECU Telemedicine Sites



JJ's Case



<https://ualbertaslp.wordpress.com/2014/02/03/the-preterm-infant-ototoxic-drugs-and-the-nicu/>

JJ was a male born 26 weeks gestation.

Low birth weight (< 1500 g).

JJ spent 2 and ½ months in the Neonatal Intensive Care Unit (NICU).

JJ's Mom is the sole provider for the family.

JJ's Hearing Assessments

JJ had his initial newborn hearing screening at 76 days prior to discharge:

- Automated Auditory Brainstem Response (AABR)
- Refer bilaterally for rescreening

JJ was rescreened at 91 days at his birthing center:

- Automated Auditory Brainstem Response (AABR)
- Refer bilaterally for diagnostic test



What are some barriers to service that JJ will experience – solutions?

WHAT ARE SOME BARRIERS TO SERVICE?

No diagnostic services at birthing center.

Single Mom with limited resources.

Resides in rural location approximately 3 hours drive from diagnostic test site.

SOLUTIONS?

30 minute drive to telemedicine site!

Appointment made!

Diagnostic Hybrid Teleaudiology Model



Synchronous services to clients and data collection in real time.

Asynchronous store-and-forward of audiometric data.

In Real Time: Introductions



Test Preparations



Examination of Results



Counseling



JJ's Test results at 4 & ½ months.

Tympanometry

- Middle Ear Function Test
 - Normal Bilaterally

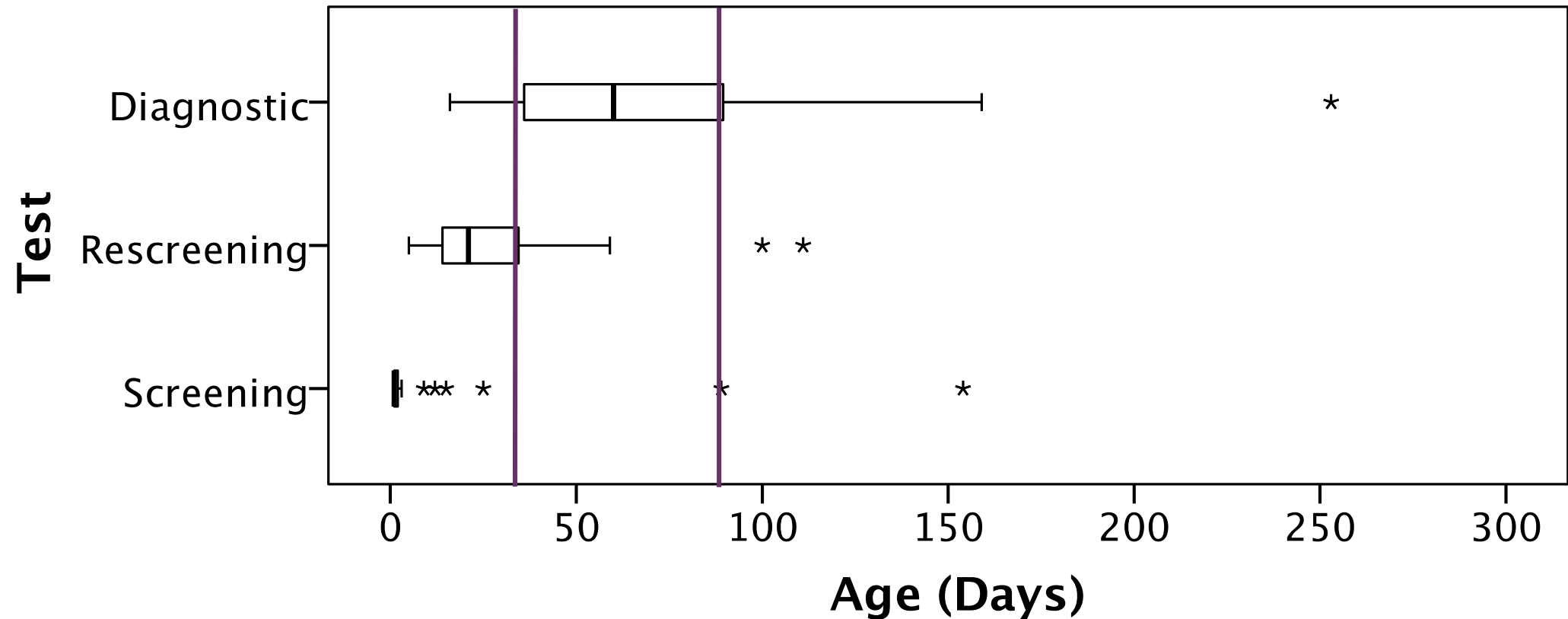
Otoacoustic Emissions

- Inner Ear/Sensory Organ Test
 - Abnormal Bilaterally

Auditory Brainstem Response

- Electrophysiological Test of Hearing Nerve and Brainstem to Estimate Behavioural Hearing Sensitivity
 - Abnormal Bilaterally
 - Severe-to-profound Sensory Hearing Loss

Does diagnostic testing work via teleaudiology?



JJ's Follow-up

Bilateral Amplification (Hearing Aids) fit at 5 months.

Nine months latter cochlear implants considered.

JJ received cochlear implants at 2 years of age.



www.medindia.net



<https://medicalxpress.com/news/2015-08-cochlear-implants-student-grades.html>

Issues for JJ and Family

No rehabilitation services at birthing center.

Mom is sole provider with limited resources.

Resides in rural location approximately 3 hours drive from rehabilitation services .

Recommendation

Amplification (Hearing Aids) Bilaterally

Moving forward...

THINGS TO DO!

Continued audiometric testing.

Hearing aid adjustments.

Cochlear implant programing.

SOLUTIONS?

Teleaudiology has been demonstrated to successfully provide:

- Hearing aid fitting/programing
- Cochlear implant programming

Audience Poll



Speech- Language Pathology

Using Telepractice to address JJ's
needs



JJ's needs for speech, language, and cognitive habilitation



Involvement of the Speech-Language Pathologists (SLP's)

EI services should be (ASHA, n.d.):

- family-centered
- culturally and linguistically responsive
- developmentally supportive
- participation in **natural environments**
- comprehensive, coordinated, **and team-based**
- based upon the highest-quality available evidence



Two telehealth-based solutions



Developmental monitoring via parent report



Direct intervention services

INvesT trial: Identification of neurodevelopmental disabilities in underserved children using telepractice

DEVELOPMENTAL MONITORING (ASYNCHRONOUS)

15 minutes to complete

- Behavior
- Emotion regulation
- Play
- Speech
- Language
- Overall identification of “risk” = 30%

DEVELOPMENTAL SCREENING & PARENT EDUCATION (SYNCHRONOUS)

30 minutes to complete

- Behavior
- Emotion regulation
- Play
- Speech
- Language
- Parental concerns
- Referral (if needed)
- Overall identification of need for further assessment = 10-15%

SLP intervention post-amplification

Focus on auditory training after amplification

Encourage speech/language/cognitive development

After cochlear implant, complete habilitation process



BabyTalk Program

SLP early intervention

Parents are the primary facilitators

Parent-directed education & modeling

for to stimulate speech/language/cognitive development

- Visual
- Objects
- Rhythm
- Visual Cues

Monitor speech/language/cognitive development via play



TACIT study, Denver, CO

Looking toward the future....

Being ready for pre-school!



Audience Poll



Questions

Audience Poll Question #1

The use of telehealth approaches for hearing and speech/language development concerns *are available and show good results?*

YES

NO

Audience Poll Question #2

In JJ's case, using teleaudiology:

- a) Addressed barriers to care experienced by the family
- b) Was done in a way that demonstrates results similar to traditional service delivery
- c) Provided state-of-the-art care for JJ and his family
- d) All of the above

Audience Poll Question #3

In JJ's case, using telerehabilitation for speech, language, and for cognitive development:

- a) Could be used to address barriers To care experienced by the family
- b) Could be done in a way that leads to similar results to traditional service delivery
- c) Could provide state-of-the art care for JJ and his family
- d) All of the above