

Strategies for Improving Loss to Follow-Up for Newborn Hearing Screening



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and Belen Ramirez, B.S.

Disclosures

- **Sarah N. McAlexander, Au.D., CCC-A, PASC, ABAC**
 - Financial Disclosures
 - Employee, Texas Hearing Institute
 - Non-Financial Disclosures
 - Board of Directors, Texas Academy of Audiology (TAA)
 - Board of Trustees, American Academy of Audiology Foundation (AAAF)
- **Belen Ramirez, B.S.**
 - Financial Disclosures
 - Employee, Texas Hearing Institute



VISION

Every child with hearing loss reaches their full potential.

MISSION

Identify childhood hearing loss as early as possible and provide families access to integrated medical, educational, and support services by understanding each child's uniqueness and empowering them to achieve their best outcome.



1947

Houston School for Deaf Children



1992

The Center for Hearing and
Speech



2020

Texas Hearing Institute



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Houston School for Deaf Children



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Houston School for Deaf Children



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The Center for Hearing and
Speech



2020
Texas Hearing Institute

Our New Home in Texas Medical Center



State-of-the-art facility with the latest technology, but designed with our kid's experience in mind!

Our Departments



AUDIOLOGY
DEPARTMENT



SPEECH THERAPY
SERVICES



MELINDA WEBB
SCHOOL



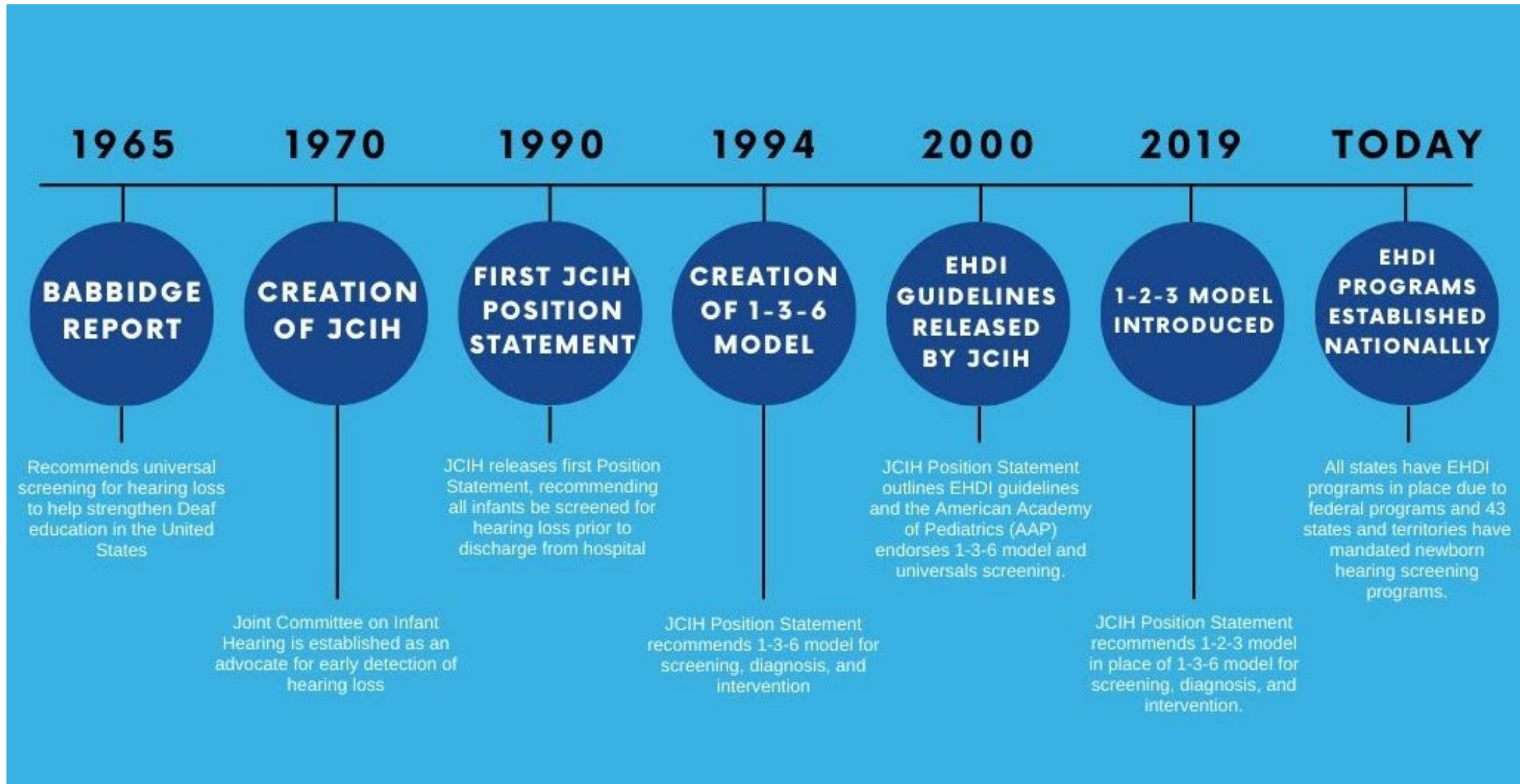
FAMILY
SERVICES



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Early Hearing Detection and Intervention

History of Newborn Hearing Screening



Average Age of Diagnosis

Before Widespread Newborn
Hearing Screening

2-3
Years

Goal Age of Diagnosis with
Newborn Hearing Screening

2-3
Months

Current EHDI Guidelines



**Traditional
Goals**

1 Month:
Screening

3 Months:
Diagnosis

6 Months:
Intervention

**Challenge
Goals**

1 Month:
Screening

2 Months:
Diagnosis

3 Months:
Intervention

Impacts of Early Identification and Intervention

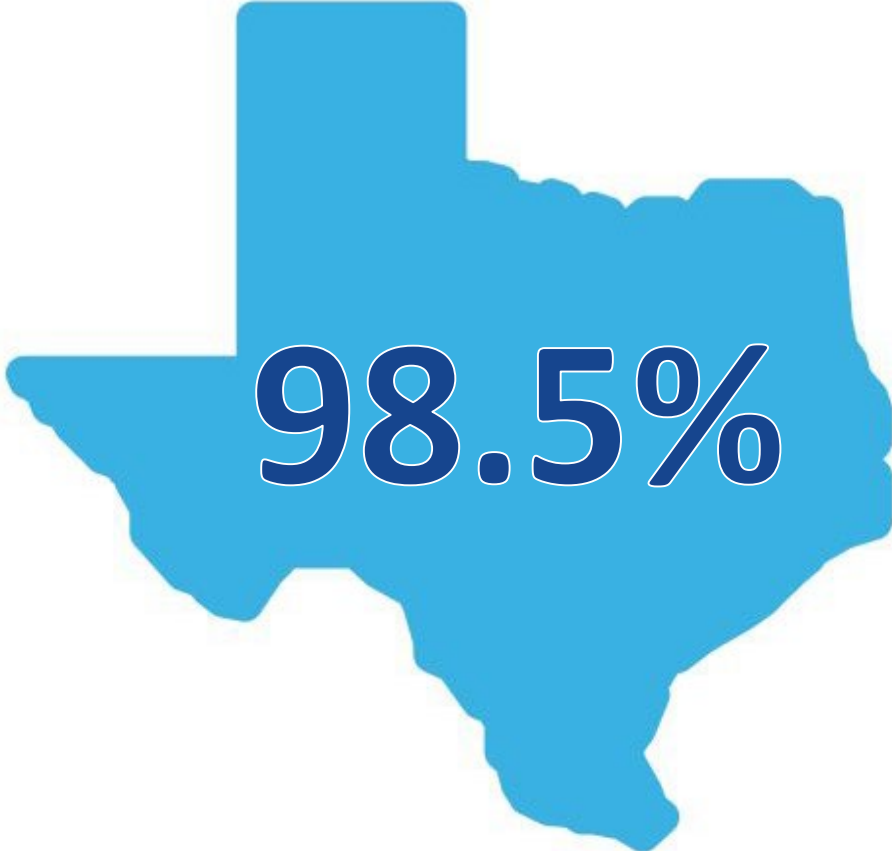
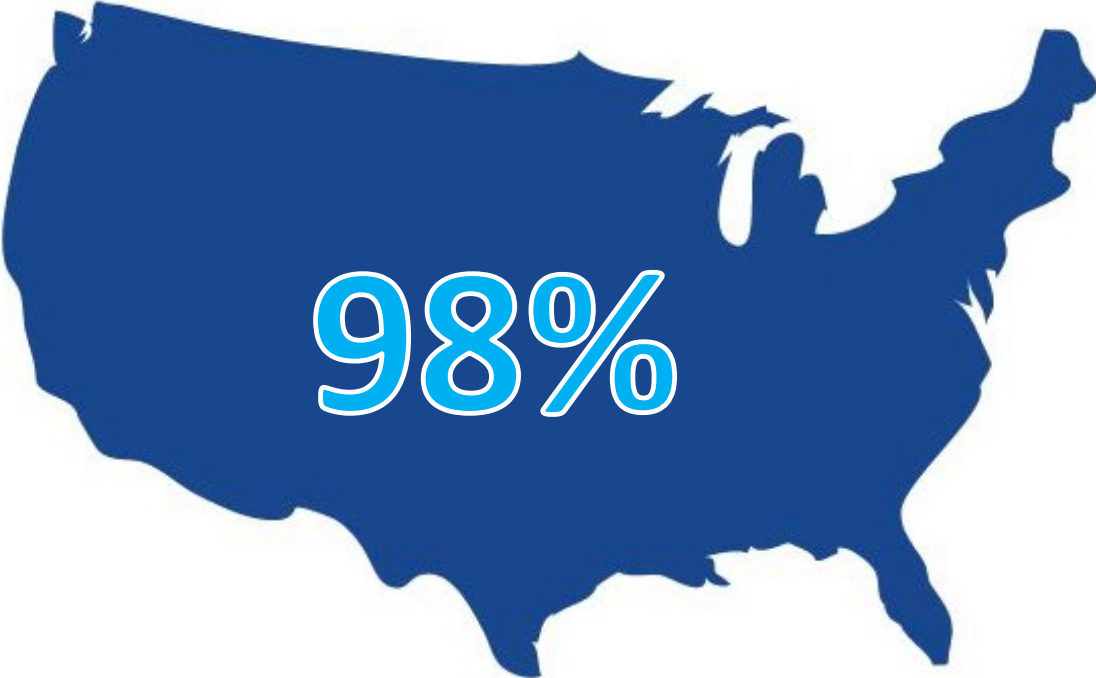
- Unidentified or untreated hearing loss in children can lead to:
 - Academic underachievement
 - Difficulty obtaining employment later in life
 - Psychological consequences (feelings of isolation, loneliness, and depression)
 - Additional family stress
 - Negative impacts on self-esteem and social skills
- Early identification and intervention of hearing loss leads to:
 - Better language outcomes
 - Access to early intervention services and additional state resources



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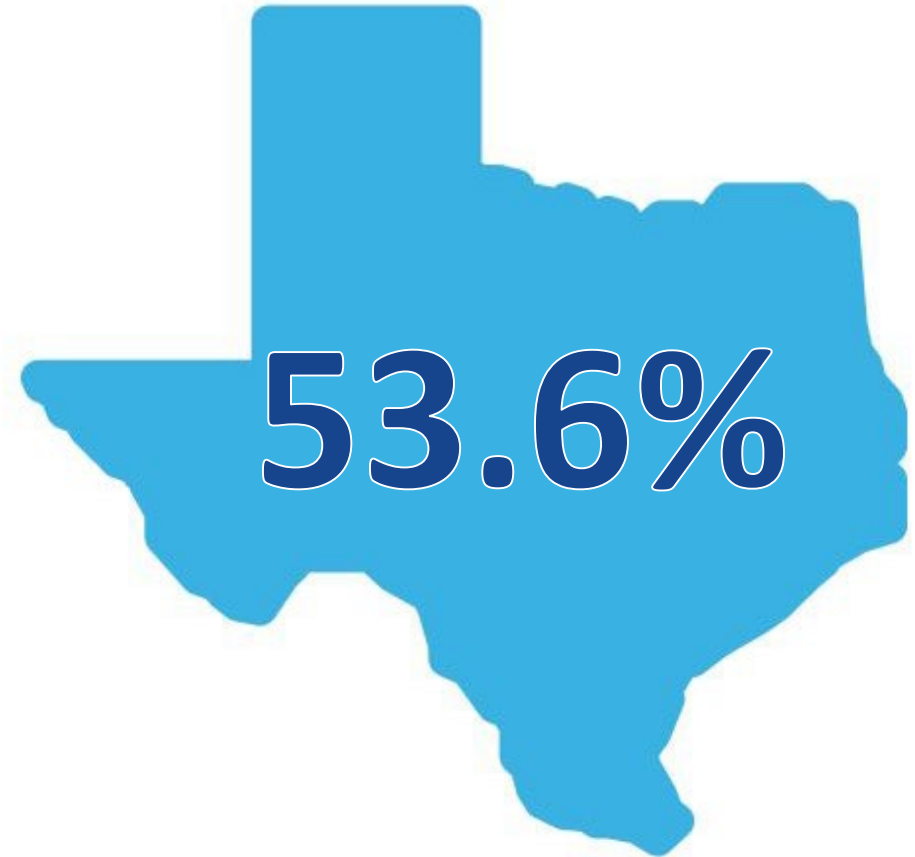
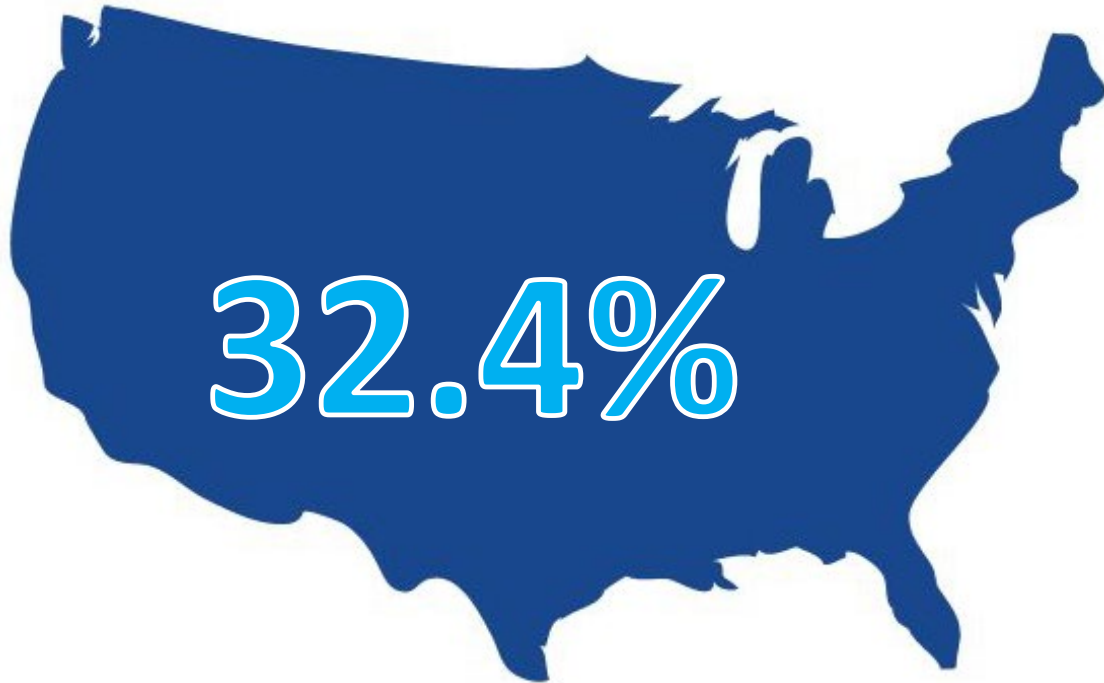
Loss to Follow-Up

Percentage of Infants Screened for Hearing Loss



<https://www.cdc.gov/ncbddd/hearingloss/ehdi-data2021.html>

Percentage of Infants Lost to Follow-Up



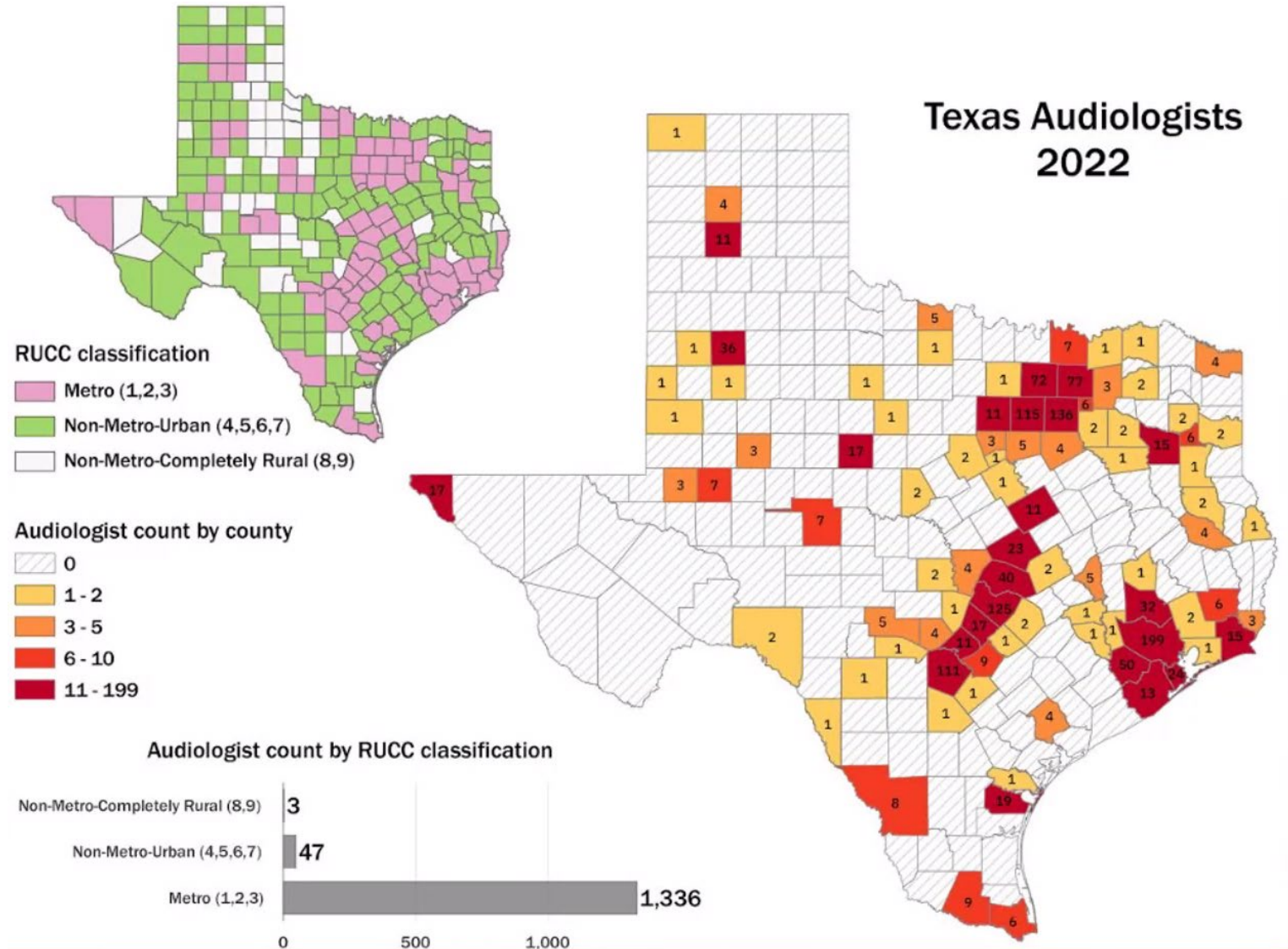
Definition of Loss to Follow-Up

- **Loss to Follow-Up:** Refers to infants who fail their newborn hearing screening at birth, but do not receive follow-up testing or audiologic services
- **Loss to Documentation:** Refers to infants who failed their newborn hearing screening and received services without the results of the follow-up testing being reported to the jurisdictional EHDI program
- **THI Formula for Loss to Follow-Up/Loss to Documentation:**
 - $$\frac{(\text{Number of Infants Unable to Contact} + \text{Number of Infants Unresponsive} + \text{Number of Infants Unknown})}{(\text{Total Number Failing the Hearing Screening})}$$

Texas Audiologists

Distribution by County

- Largely centered in major cities of Houston, Dallas, Austin, and San Antonio
- Providers represented on this map consist primarily of adult providers who do not provide diagnostic ABR services or services for Medicaid patients



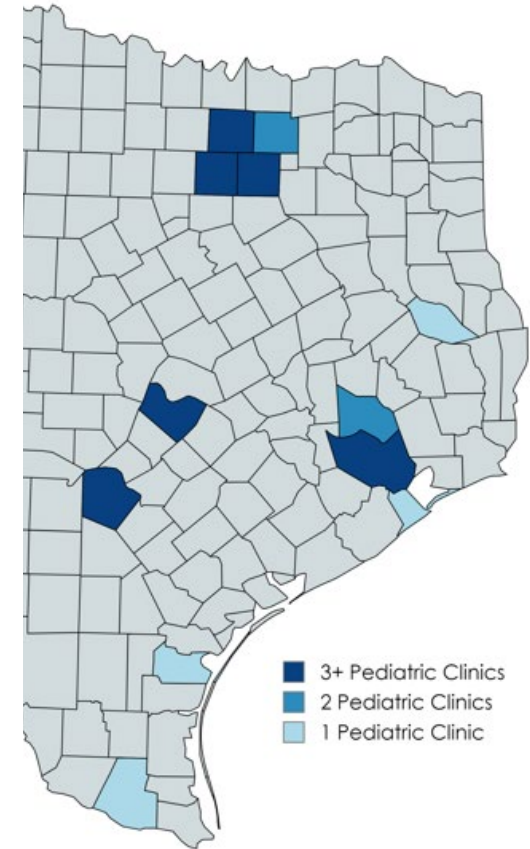
Distribution of Pediatric Audiologists Performing ABRs in Texas

-



36%

-



Improving Loss to Follow-Up

- It is part of our mission at Texas Hearing Institute to improve the 53.6% loss to follow-up rate in Texas.
- All children should be
 - Screened by 1 month of age
 - Diagnosed by 3 months of age
 - And enrolled in intervention and amplified by 6 months of age
- Texas Hearing Institute is striving to hit the 1-2-3 challenge goal set by JCIH in the 2019 Position Statement



What are some things
you do in your clinic
to ensure EHDI
guidelines are met?

A Day in the Life of a Pediatric Audiologist

- **Provide care during patient appointments**
- Write reports documenting patient care
- Follow-up with patients regarding next steps or addressing questions
- Answer patient phone calls, messages, and emails
- Follow-up with collaborating providers and schools on patient's care
- Write letters of medical necessity and sign forms for schools, work, and insurance
- Order hearing technology and ensure newly delivered technology is ready to be dispensed
- Calibrate and troubleshoot equipment
- Supervise audiology students and externs
- Effectively manage caseload to ensure patients diagnosed with hearing loss do not fall through the cracks
- Develop relationships with collaborating providers and referral sources
- Create patient educational materials
- Manage various programs and projects
- Assist during others' appointments as needed
- ... and more!

So What
Do We
Do?



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Newborn Hearing Screening Advocate

Meet
Belen!

Newborn Hearing Screening Advocate

- In order to help improve loss to follow-up rates at Texas Hearing Institute, a Newborn Hearing Screening advocate was added to the team in 2021
- Hired to ensure all infants who fail their newborn hearing screening receive diagnostic testing and intervention in a timely manner to meet “1-3-6” EHDI guidelines

Newborn Hearing Screening Advocate: Goals

- **Primary Goal:** Ensure that infants referred to THI, who fail their UNHS, receive a diagnostic Auditory Brainstem Response (ABR) test and begin intervention to meet the “1-3-6” Texas Early Hearing Detection and Intervention (TEHDI) guidelines.
- **Secondary Goals:**
 - Assist families in coordinating care and scheduling appointments
 - Assist audiologists with documentation in TEHDI database
 - Assist audiologists and speech-language pathologists during communication options consults
 - Opportunity to discuss various language modalities and options with families, as well as resources for pursuing those communication modalities
 - Assist with outreach efforts

So What Do I Do?

- Schedule ABRs
- Follow-Up with Missed Appointments
- Provide Instructions Prior to Appointments
- Explain Importance of Testing to Families
- Provide Interpretation to Spanish Speaking Families
- Track Internal ABR Numbers
- Ensure Documentation in TEHDI System
- Work with Community Partners to Generate Referrals and Provide Education on Importance of Hearing Testing
- Ensure Access to Intervention
- Coordinate Follow-Up with ENT
- Coordinate Speech Evaluation Referrals
- Coordinate Referrals to Early Intervention
- Collaborate with Statewide Outreach Center
- Communicate Results of Testing to Referral Sources
- Provide Options for Financial Support
- Provide Additional Resources for Newly Diagnosed Infants
- Collaborate with Audiologists and Leadership Team at THI to Improve Programs

... And More!

Identifying Barriers to Care and Potential Solutions

- Lack of insurance/financial support for audiology appointments
 - Grant funding for initial ABR appointments
 - Sliding fee scale for follow-up appointments
 - Relationships with grant programs for hearing aids and cochlear implants in Texas to obtain devices for underinsured or uninsured patients
- Lack of transportation
 - Medicaid transport
 - Remote ABR program
 - Remote speech services
- Limited English proficiency
- Difficulty scheduling necessary follow-up appointments with ENT or speech
- Difficulty understanding test results or next steps
- Adequate time for caseload management for audiologist
- Time to obtain devices and accessories
 - In house earmold lab
 - Hearing aid loaner bank and Jump Start program

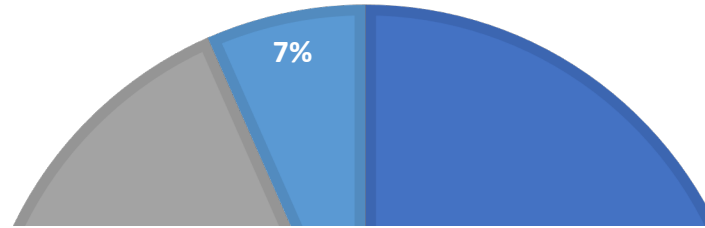
Roadmap to Success



Importance of Bilingual Care in Texas

LANGUAGE SPOKEN AT HOME IN TEXAS

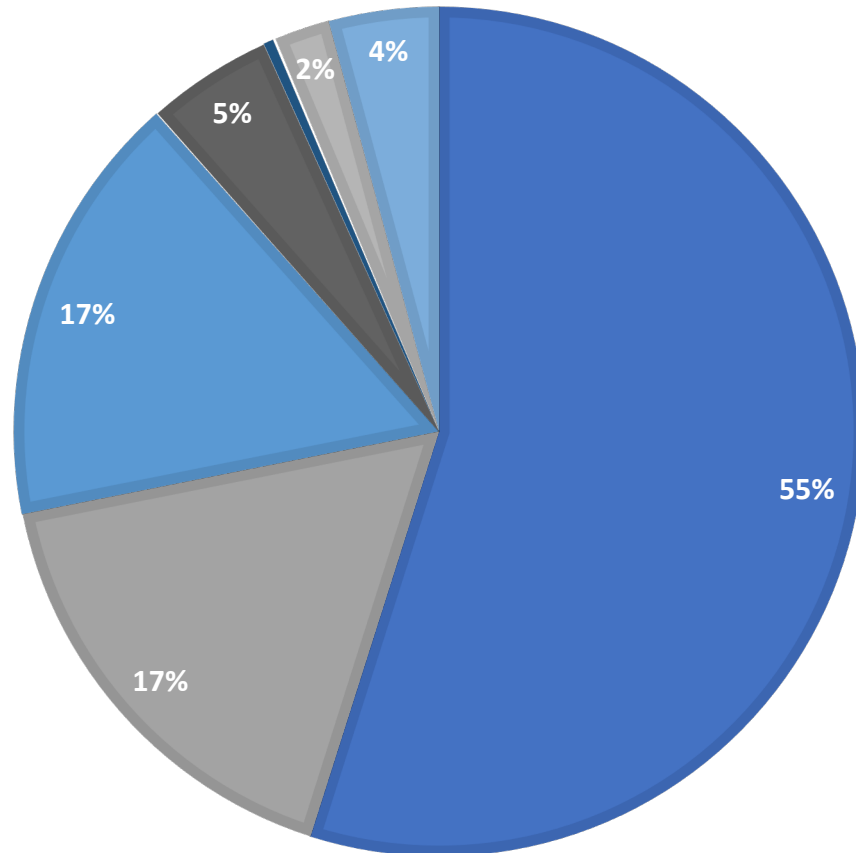
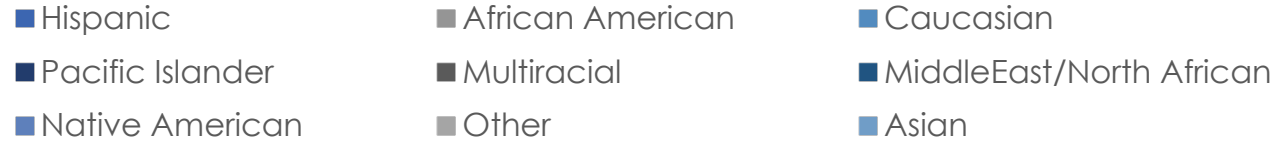
■ English ■ Spanish ■ Other



**In Harris County: 35.4%
speak Spanish at home!**

Bilingual Care at Texas Hearing Institute

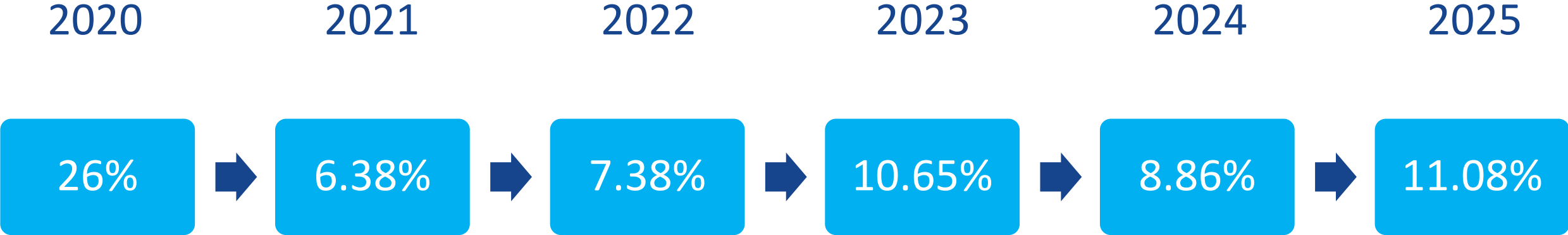
ETHNICITY STATISTICS AT THI



- Bilingual Newborn Hearing Screening Advocate: English and Spanish
- Ensures effective communication with patients and their families

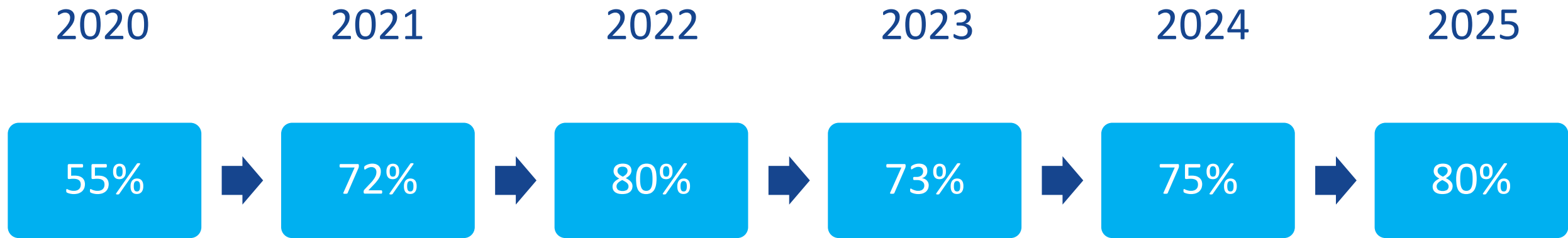
Has it Helped?

Loss to Follow-Up Numbers at Texas Hearing Institute



Has it Helped?

1-3-6 Numbers at Texas Hearing Institute



*Indicates patients who met all proposed goals: screening by one month, diagnosis by three months, and intervention (amplification, speech therapy, or access to sign language/manual communication by six months)

Case Study: Patient S

- Spanish-speaking family
- Born September 2024
- Referred to THI in October 2024 for diagnostic testing following failed newborn hearing screening
- Initial insurance check showed that baby was not yet added to the parent's policy, impacting their ability to potentially pay for the appointment
 - Newborn hearing screening advocate added patient to a grant to pay for the appointment
- Diagnosed with mild sensorineural hearing loss bilaterally in November 2024
- Family left the country shortly after diagnosis and managing audiologist left clinic
 - Newborn hearing screening advocate continued to follow-up to track this baby's outcome – they returned and a follow-up appointment was scheduled for July 2025, confirming hearing loss
- Patient's insurance did not fully cover hearing aids
 - Newborn hearing screening advocate worked with family, audiologist, and billing team to discuss options for paying for hearing aids
 - Patient was eventually fit with loaner devices in October 2025 while we await grant funding for personal devices



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“First Sounds”: Remote ABR Program

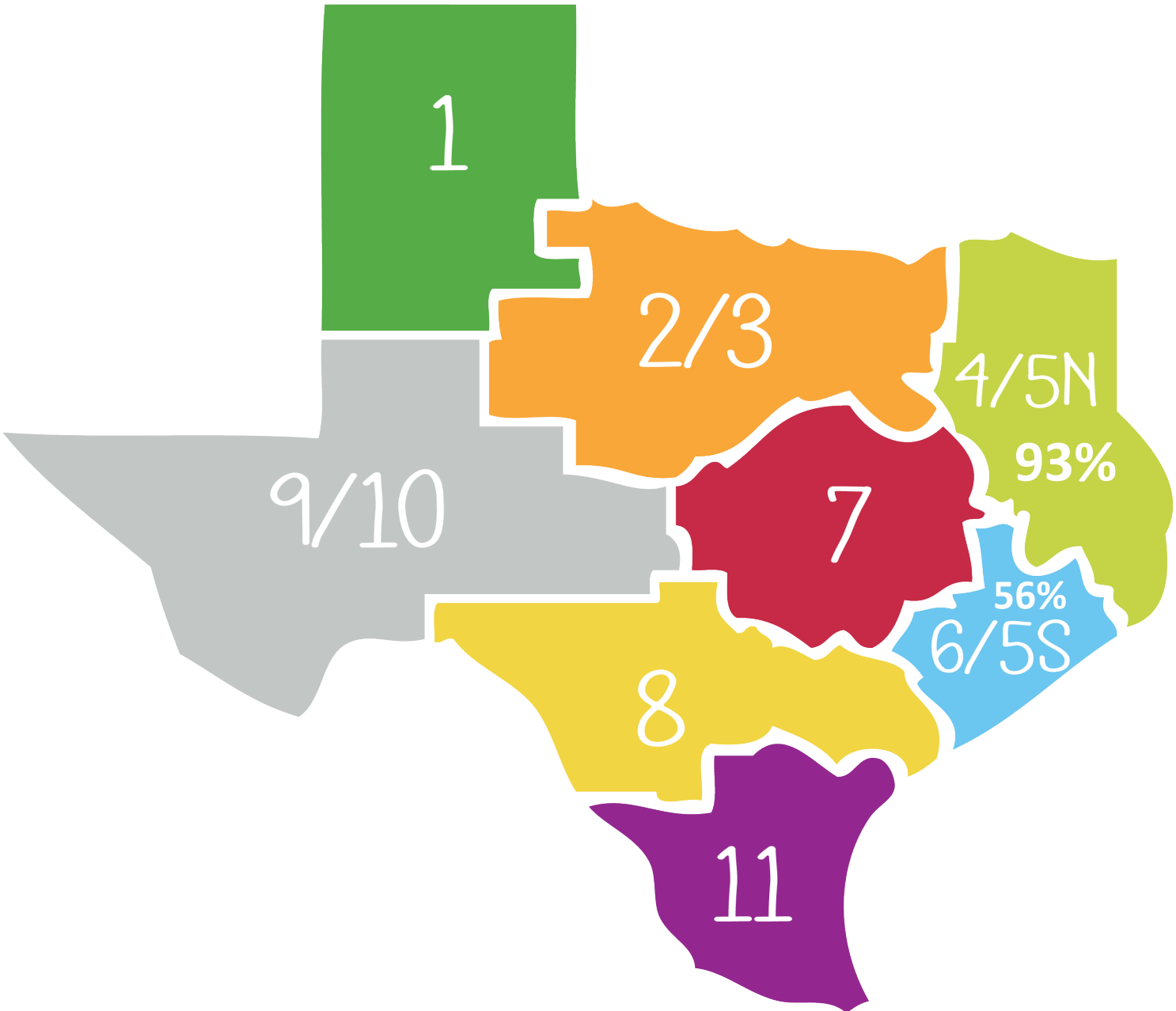
Current Remote Services at THI

- Two-Week Hearing Aid Checks
- Cochlear Implant Selections
- Cochlear Implant Mappings
- Speech Therapy
- Auditory Brainstem Response (ABR) Evaluations

Initial Remote ABR Program Goals

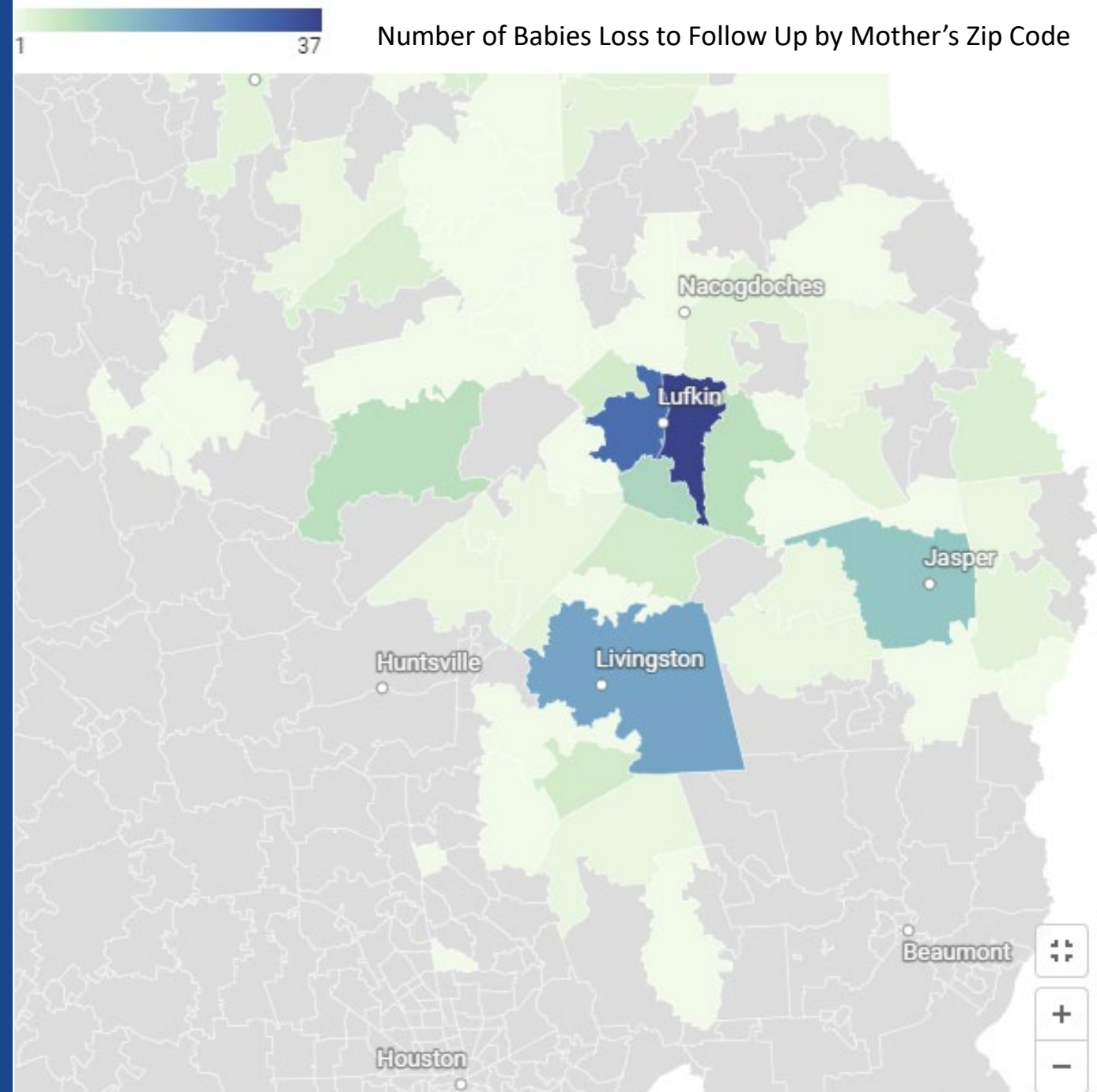
1. Assist with the LFU Percentages in Texas
2. Location
 - Target a region with a high percentage of infants LFU documented
 - Close enough to THI to allow for a day trip to train/troubleshoot
 - Located in a “Pediatric Audiology Dead Zone”
 - Target a region with no access to diagnostic ABR services in the area
3. Simultaneously support early intervention via telehealth speech services
4. Implement Two Audiologic Phases
 - Remote ABR
 - Remote HA Fittings*

LFU Statistics
based on data from
March 21, 2021, to
February 28, 2022



Lufkin Area Loss to Follow-Up

- 93.5% LFU in Region 4/5
- 188 Babies LFU in Lufkin Service Area
- Higher than average NBHS fail rate in Lufkin
- Lower than expected percentage of babies diagnosed with hearing loss



Collaboration Model

- Audiological Services:
 - Established adult audiology private practice in Lufkin, Texas
 - THI provides remote ABR services with in-person support from on-site Audiological Services staff
 - Excellent reputation within the community
- Support THI's mission to reduce the LFU/LTD
- Contract in place to pay Audiological Services for four hours of ABR time per week
- Built-in training time and site visits to set up the clinic
- Developed written protocol to follow for consistency



Outreach and Marketing

FIRST SOUNDS



Babies use their senses to learn about the world around them.

>90%

Over 90 percent of children in Deep East Texas are lost to follow-up after failed newborn hearing screenings

3

MONTHS

The Joint Commission on Infant Hearing states diagnostic evaluations should occur by 3 months of age



Infant diagnostic hearing evaluations are now being performed remotely in Lufkin, TX



THI-Pineywoods accepts most Medicaid plans and private insurances and offers a sliding fee scale



Referrals can be made by email or fax



Is your patient over 9 months old? We may need to provide services at our Houston location



"Chloe received an ABR and diagnosis of hearing loss at 2 months old and had access to specialized intervention. Today at 6, she is a straight A student and received an award for being her classroom's best reader. This was possible because of an early referral from her health-care provider and the early diagnosis and intervention services she received."

FIRST SOUNDS



Babies use their senses to learn about the world around them.

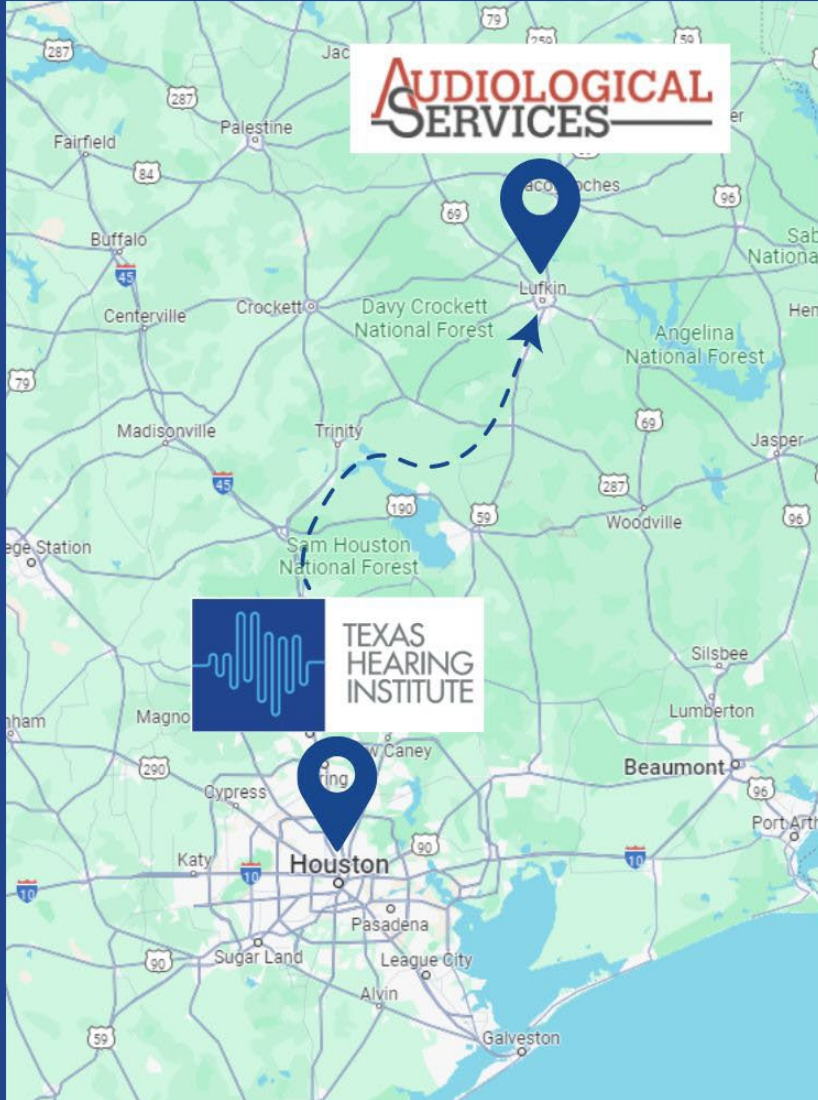


First Sounds helps your baby hear from the start.

Listening supports your baby's brain development.



DON'T DELAY!
Have your baby's hearing tested today.



Provider in Lufkin Sets Up Patient for ABR



Internet Connection

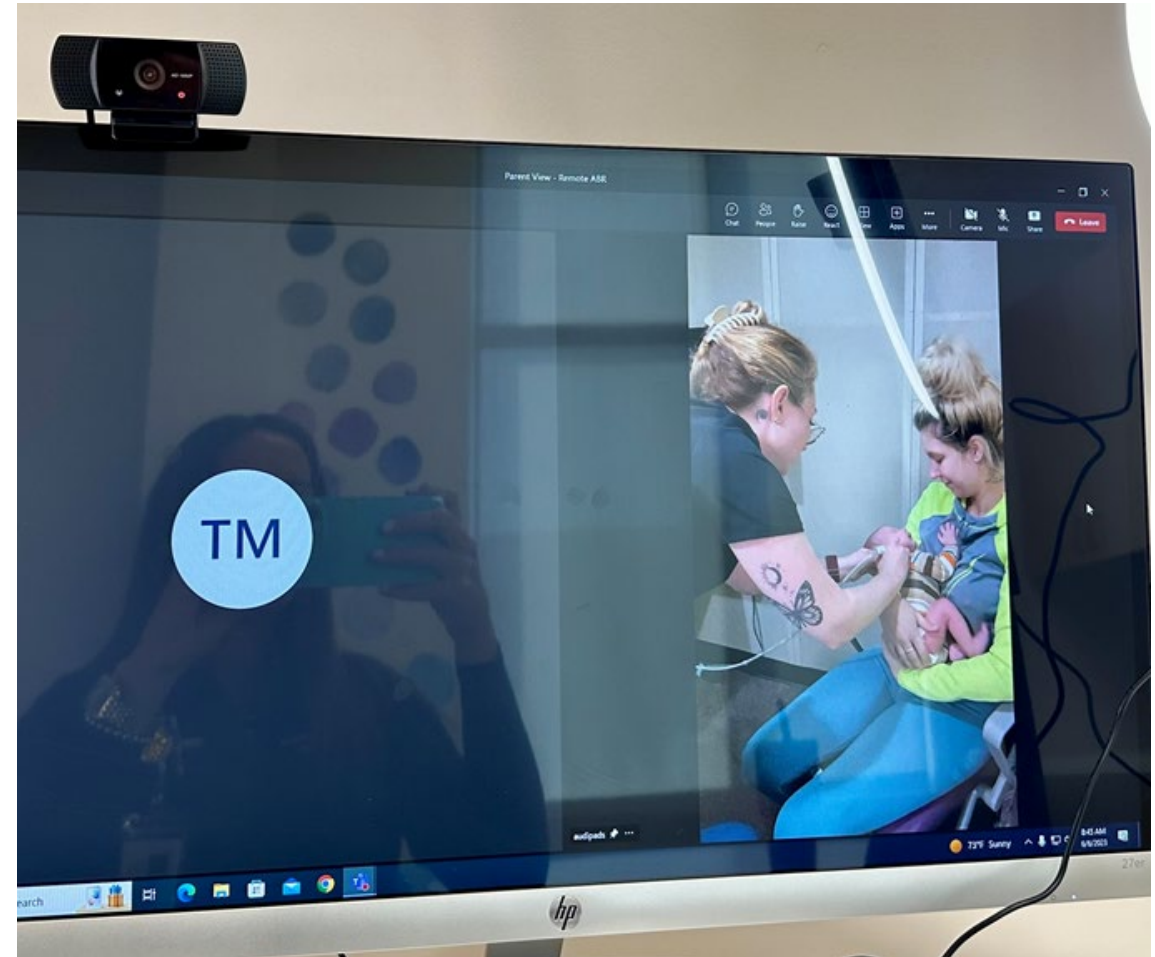


Provider at THI Performing ABR

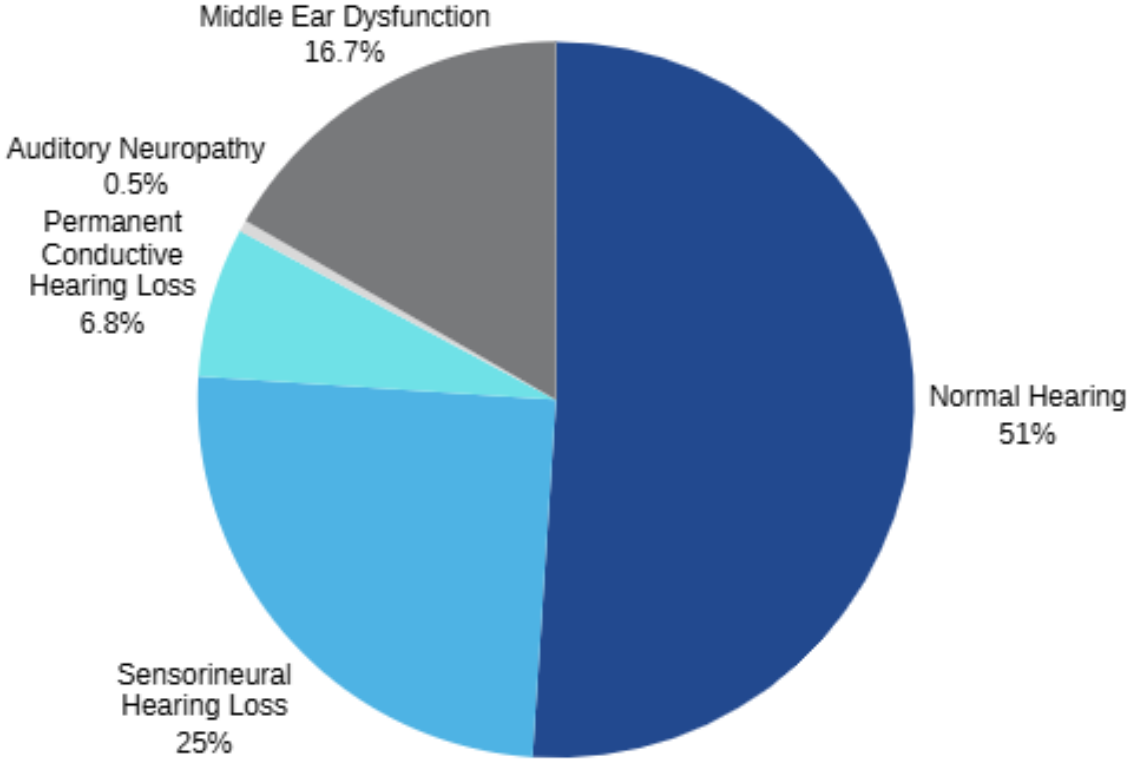


Remote ABR: Success

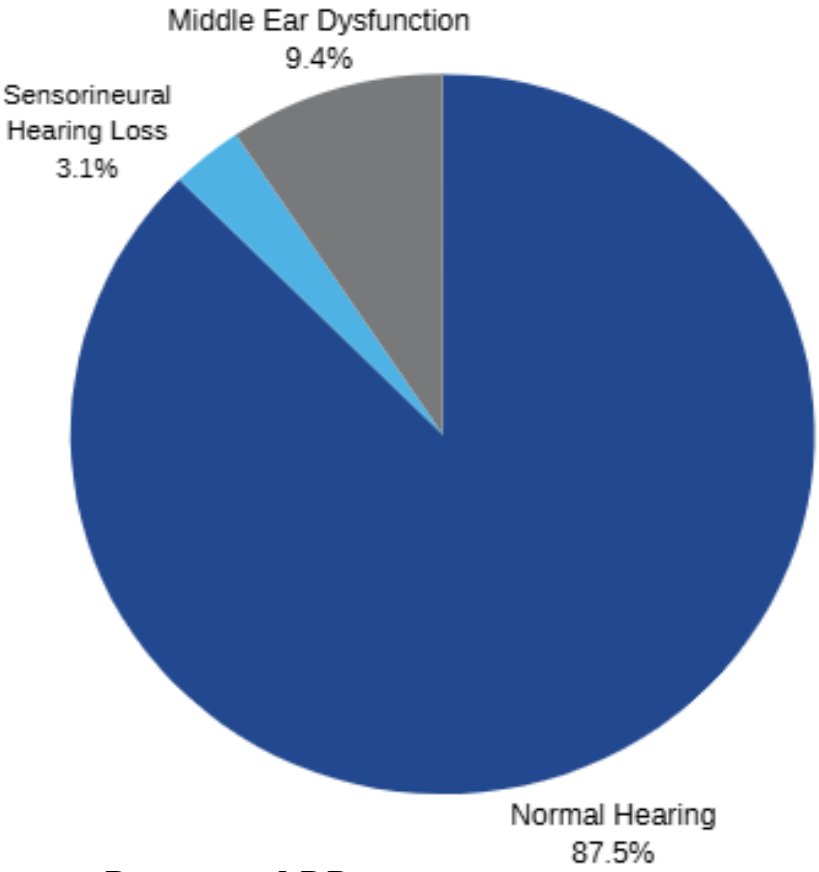
- As of February 2026, 135 ABRs have been performed
 - 17 in 2023 (16 new patients)
 - 52 in 2024 (44 new patients)
 - 58 in 2025 (34 new patients)
 - 8 in 2026 (8 new patients)
- Seven infants have been diagnosed with permanent hearing loss



Remote ABR: Observations

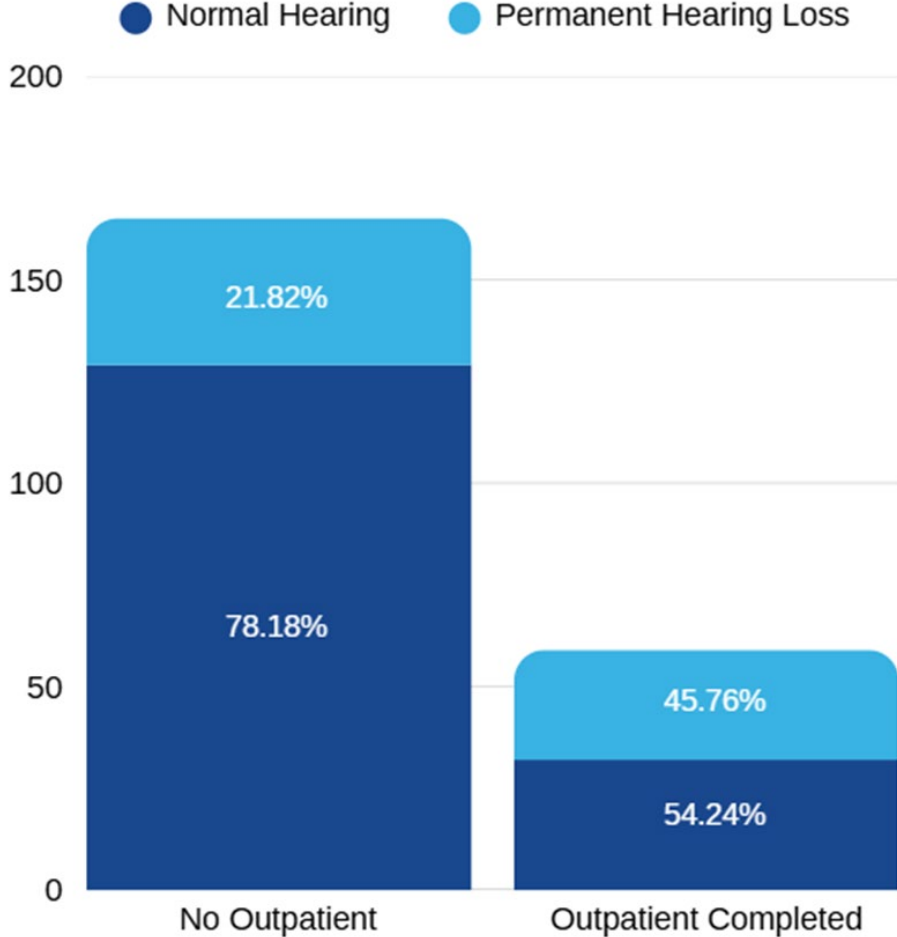
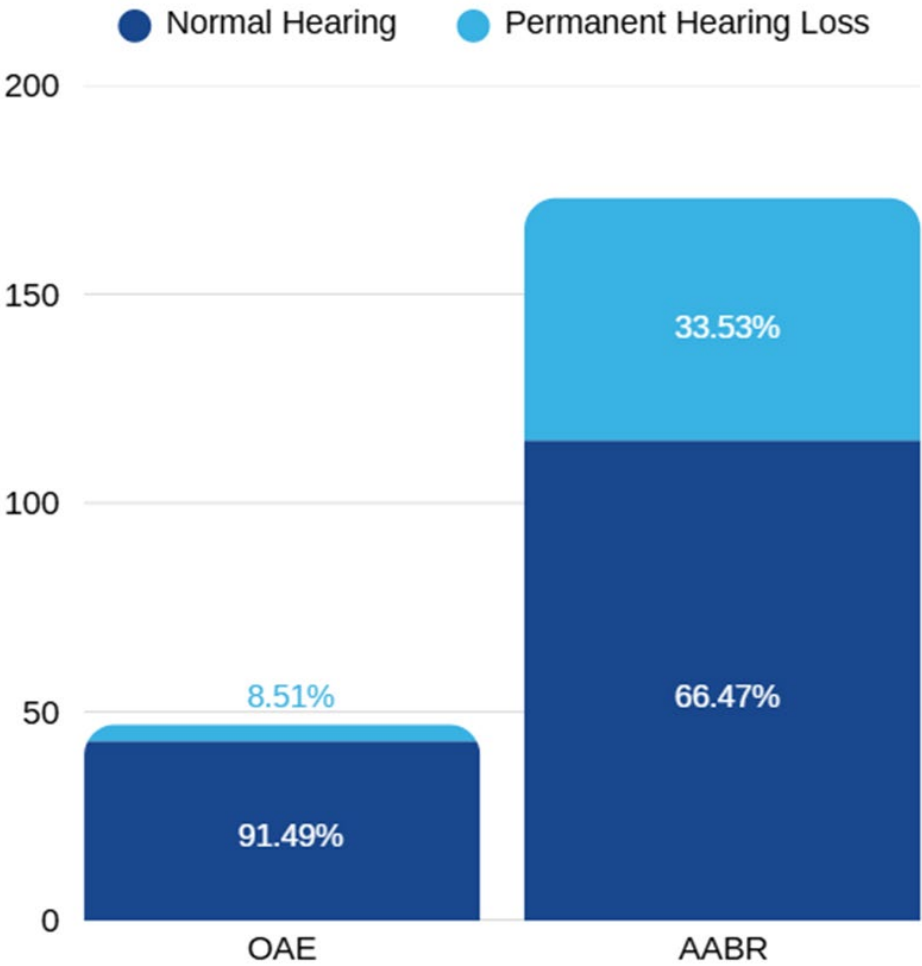


In House ABR Program



Remote ABR Program

Remote ABR: Observations



Remote ABR: Observations

- Introduction of “Outpatient Screening Protocol”
 - Shorter appointment length to accommodate more patients

No Outpatient or Rescreen



1. Tympanometry
2. DPOAEs
3. High Intensity Click
4. Click to Threshold

Outpatient or Rescreen Completed



1. Tympanometry
2. DPOAEs
3. High Intensity Click
4. Diagnostic ABR at 500, 2000, and 4000 Hz

Remote ABR: Next Steps

- Investigate new locations for additional remote ABR programs
- Create protocol for remote hearing aid fittings and additional remote procedures, to continue to serve patients who are seen through these programs
- Continue outreach methods to provide better education for pediatricians, birth hospitals, and additional referral sources in the areas served by our remote ABR programs

Remote ABR: New Locations

- In State
 - Remote ABR Program in Midland, TX
- Out of State
 - Remote ABR Program in Indiana in collaboration with St. Joseph Health System



Case Study: Patient J

- Born May 2025
- Seen in July 2025 for an ABR through our remote ABR program
 - Diagnosed with severe to profound sensorineural hearing loss bilaterally
- Began virtual speech therapy services through THI in August 2025
 - Pursuing total communication approach
- Fit with hearing aids at THI in January 2026
 - Delays with seeing an ENT and determining where they would like to continue follow-up care
- Referred to cochlear implant ENT to continue with cochlear implant process

Case Study: Patient J

Successes for Patient J's Care

- Earlier diagnosis
- Access to earlier intervention
 - Speech therapy
 - ASL
- Opportunities to provide some additional remote appointments when possible
 - Follow-up following hearing aid fitting
 - Speech therapy
 - Potentially cochlear implant services after implantation
- Opportunities to collaborate with ENTs and pediatricians from the Lufkin area

Challenges (and Future Opportunities!) for Patient J's Care

- Delays in hearing aid fitting due to transportation to clinic and ENT availability
 - Develop protocol for remote hearing aid fitting in conjunction with partnering clinic
 - Increase outreach to area ENTs to develop a working relationship
- Limited access to cochlear implant surgeons in the patient's area, requiring additional drive times to Houston area for appointments
 - Work with area ENTs to order necessary imaging to be reviewed by cochlear implant surgeon
 - Consider telehealth when possible for follow-up ENT appointments



**ANY
QUESTIONS?**



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Resources

- EHDI Pediatric Audiology Links to Services (EHDI-PALS)
 - <https://www.ehdi-pals.org/default.aspx#gsc.tab=0>
- Joint Committee on Infant Hearing EHDI Guidelines
 - <http://www.jcih.org/>
- Centers for Disease Control and Prevention (CDC) Annual EHDI Data
 - <https://www.cdc.gov/ncbddd/hearingloss/index.html>
- National Center for Hearing Assessment and Management (NCHAM) at Utah State University
 - <https://www.infanthearing.org/>
- World Health Organization (WHO)
 - <https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss>
- American Speech-Language-Hearing Association
 - <https://www.asha.org/advocacy/early-hearing-detection-and-intervention/>
- American Academy of Audiology (AAA) Practice Guidelines and Standards
 - <https://www.audiology.org/practice-resources/practice-guidelines-and-standards/>