



South Dakota Early Hearing Detection & Intervention Program: Using Teleaudiology to Conduct Infant Diagnostic Assessments

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Abstract

Teleaudiology allows patients and providers to bypass several economic and geographic barriers that impede the delivery and accessibility of audiological services. The South Dakota Early Hearing Detection and Intervention (EHDI) program recognized this benefit and created a teleaudiology infrastructure for the diagnostic assessment of infants. Using a hub-and-spoke model, a certified pediatric audiologist at the hub site assesses infants located at two spoke sites in South Dakota. Remote control software applications are used to provide a synchronous method of service delivery. The audiologist's test battery includes video otoscopy, tympanometry, and auditory brainstem response (ABR) testing. Since establishing the teleaudiology program, nine infant assessments have been completed. The South Dakota EHDI program will continue improving the teleaudiology project to ensure all infants in the state have access to pediatric audiological services.

Introduction

- Telepractice enables clinicians to offer health services at a distance by linking clinician and patient or clinician and clinician via technology.
- Long distances, detrimental weather conditions, travel expenses, and impaired mobility are all factors that may impede the delivery of audiological services.
- Within the pediatric population, untreated hearing loss can affect a child's speech, language, cognitive, and social development.
- Several audiological services have been delivered via telepractice, and research studies validate the accuracy and feasibility of such services.
- Teleaudiology applications have also been used by several state Early Hearing Detection and Intervention (EHDI) programs.
- EHDI programs adhere to the "1-3-6" benchmarks: all newborns should be screened for hearing loss no later than one month of age; newborns who refer on their initial screening should receive a diagnostic evaluation no later than three months of age; and infants who are identified as deaf or hard of hearing should enroll in early intervention services no later than six months of age.

History of South Dakota EHDI Program

- South Dakota's EHDI program was established in 2001 after the state received funding from the Centers for Disease Control and Prevention (CDC). Additional funding was provided by the Health Resources and Services Administration (HRSA) in 2015.
- High lost-to-follow-up/lost-to-documentation (LTF/D) rates remain a priority for the South Dakota EHDI program. These rates are highest among American Indian families and infants born to low-income families living in western and central South Dakota. Several reasons account for the state's high LTF/D rates such as limited pediatric audiological services, rurality/geographic isolation, and high poverty levels.

Creation of Teleaudiology Infrastructure

From 2016 to 2017, the Collaborative established two teleaudiology sites in South Dakota in an effort to reduce the high LTF/D rates.

Method

Using a hub-and-spoke paradigm, synchronous (real-time) methods are used to assess infants for hearing loss. A hub-and-spoke model allows healthcare professionals (located at a centralized *hub* site) to assess patients located at distant *spoke* sites via telepractice. The University of South Dakota Speech Language and Hearing Clinic, located in Vermillion, South Dakota, serves as the hub site. The first spoke site is located at the Sanford Health Winner Regional Hospital in Winner, South Dakota. The second spoke site is located at Avera Saint Luke's Hospital in Aberdeen, South Dakota. The audiologist's test battery includes video otoscopy, tympanometry, and auditory brainstem response (ABR) testing.

Training

Medical personnel at the spoke site locations were trained on proper procedures for placing equipment and interacting with family members. Toolkits, PowerPoint presentations, and video trainings were also provided to spoke site assistants.

Equipment

Equipment	Software	Additional Requirements
Video otoscope	Software allowing remote access to spoke site computer	Adequate upstream speed at spoke site (must be at least 3 megabit)
ABR equipment	Software allowing video and audio connection between hub and spoke sites	Permissible ambient noise levels at spoke site
OAE equipment		Internet connection at spoke site
Tympanometry equipment		Trained technicians at spoke site
Computer to run hardware and software programs		
Web camera		
Ancillary supplies (probe tips, specula, etc.)		

Note. Establishing a teleaudiology program requires standard audiology equipment, specific software programs, and additional standards required of the spoke site itself. ABR = auditory brainstem response; OAE = otoacoustic emissions

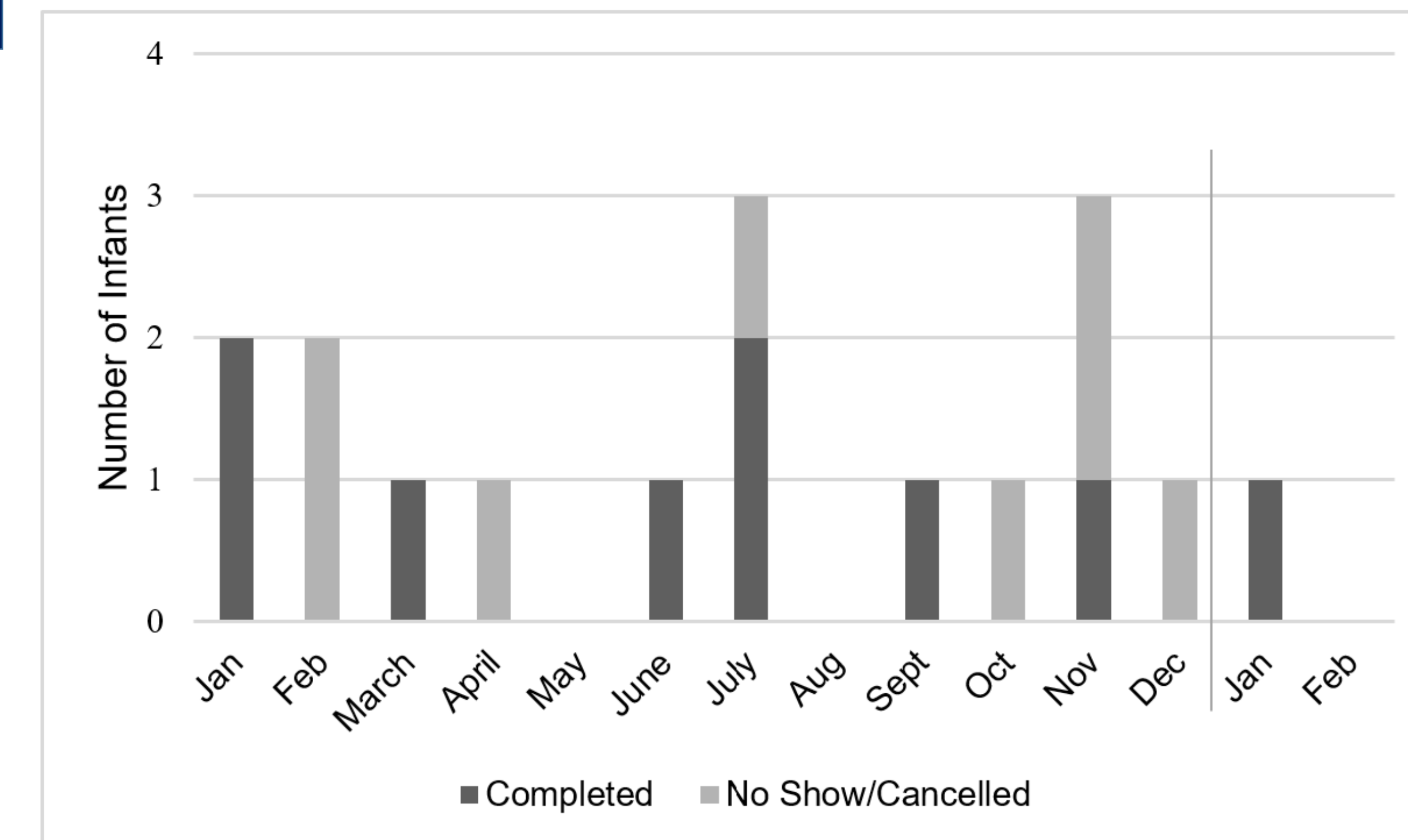
Results

Testing at the teleaudiology sites began in January 2019. As of February 2020, a total of nine infants have received diagnostic assessments. Eight additional appointments were classified as *no show or cancelled* (see Table 2).

Although one spoke site was consistently referring infants to their teleaudiology location, the other spoke site was facing challenges with its referral process.

Note. Article was published in the *Journal of Early Hearing Detection & Intervention*, 2020; 5(1): 47-53

Table 2



Collecting Feedback from Spoke Sites

A formal feedback survey was given to medical personnel at each spoke site. Overall, feedback was positive and recommendations for improvement were addressed.

Conclusion

The South Dakota EHDI Collaborative's teleaudiology program and its adoption of a hub-and-spoke model has demonstrated the feasibility of using remote control software applications to complete video otoscopy, tympanometry, and ABR testing.

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