Title: Defining Essential Services for Deaf and Hard of Hearing Children during the COVID-19 Pandemic

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Abstract

COVID-19 is a rapidly growing global pandemic caused by a novel coronavirus. With no vaccine or definitive treatment, public health authorities have recommended a strategy of “social distancing,” reducing individual interaction, canceling elective procedures, and limiting non-essential services. Healthcare providers must determine what procedures are considered “elective,” balancing risk of treatment delays with that of coronavirus exposure to patient, family, or providers. Given critical periods for language development and the long-term impact of auditory deprivation, some audiologic and otologic services should be considered essential. In this manuscript we describe the experience of a quaternary referral pediatric hospital in Seattle, the initial epicenter of COVID-19 in the United States, and share strategies for risk minimization employed by Seattle Children’s Hospital. We hope this work can be a reference for other centers continuing care for children who are deaf and hard of hearing during the COVID-19 and future resource-limiting crises.
Introduction

Coronavirus disease 2019 (COVID-19) is an acute respiratory illness caused by the newly identified β-coronavirus SARS-CoV-2 virus.[1] At more than 2 million cases worldwide, the pandemic is a global public health emergency.[2] With no vaccine or treatment, “social distancing,” or reducing interpersonal and community interaction, may be the only way to minimize disease transmission.[3] Accordingly, the Centers for Disease Control and Prevention published recommendations on March 9, 2020 for healthcare in Seattle, WA to cancel non-urgent procedures, minimize clinic volume and utilize telehealth where possible.[4] However, providers must determine what health services are considered urgent or essential.

Care for patients who are deaf and hard of hearing (DHH) should be considered time-sensitive and essential during the pandemic. Of particular importance, Early Hearing Detection and Intervention (EHDI) programs in all 50 states promote “1-3-6” benchmarks: newborn hearing screening by one month of age, diagnosis of hearing loss (HL) by three months, and the opportunity to enroll in early intervention services by six months.[5] Children with HL enrolled in intervention by 6 months of age have improved language scores when compared to those identified later.[6] But in addition to EHDI, sudden HL, HL due to meningitis, or HL related to medical treatment warrant prompt evaluation.

Setting
The first reported cases of COVID-19 in the United States occurred in Seattle, WA. Since then, there have been 4620 cases and 303 deaths in King County to date.[2] Seattle Children’s Hospital (SCH) is a major referral center for children with positive newborn screens or diagnostic testing in our region. It also serves as a quaternary referral pediatric hospital for the Washington, Wyoming, Alaska, Montana, and Idaho region. Our team of 10 fellowship-trained pediatric otolaryngologists and 30 pediatric audiologists see nearly 40,000 visits per year. The two divisions met early in the crisis and defined the following services for DHH children as essential.

Newborn Hearing Screening

SCH is not a birthing center, but at this time, several birthing centers in Washington state have stopped outpatient hearing screening and rescreening during the pandemic. In some birthing centers, otoacoustic emission (OAE) or auditory brainstem response (ABR) screening is performed by labor and delivery nurses who continue to care for perinatal patients. It is unclear whether the third parties that perform hearing screening in other birthing centers will continue full service.

Reduction in screening increases the importance of risk-mitigation strategies. We are developing an outreach plan to identify those babies not screened at birth and those referred for a diagnostic hearing evaluation whose appointment was canceled because of parental COVID-19 concerns.

Audiologic Evaluation
The SCH Audiology Division has prioritized scheduling diagnostic ABRs for patients who referred in both ears on newborn hearing screening. Diagnostic ABRs for babies nearing 6 months of age are particularly important, as this is the oldest the procedure can be performed without sedation. Patients without access to speech or communication who are acutely “out of sound” are also prioritized. These include patients with HL without functioning hearing aids or cochlear implants.

Older children with suspected changes in hearing or at increased risk for HL are also being seen. These also include audiograms deemed urgent by the otolaryngology, craniofacial, and hematology-oncology services, to evaluate for HL resulting from disease or medical treatment. Unilateral HL is not considered an urgent indication for audiogram, unless sudden in onset.

Hearing Device Fitting

New hearing device fitting continue to be scheduled for patients with bilateral HL who would not have access to communication otherwise. Hearing aid fitting is based on an audiogram or ABR that is less than 6 months old, so patients nearing the expiration of this interval are seen more urgently. Hearing device troubleshooting appointments are carried out via telemedicine where possible.

Otologic Surgery

Because mastoidectomy is considered an aerosol-generating procedure, considerable concern exists around cochlear implantation.[7] However, given the importance of early
age at implantation on spoken language outcome,[8] cochlear implantation is considered essential if the patient has pre-lingual HL (excluding second-side surgeries), or if the patient is without means of communication. Other urgent indications for mastoidectomy include acute mastoiditis and cholesteatoma.

**Resources**

The services SCH offers during the COVID-19 pandemic, including those for DHH children, rely heavily on the personal protective equipment (PPE), testing, and prevention resources available. Providers, patients and family members are screened for symptoms and fever at hospital entry points. Only one family member may accompany pediatric patients. Patients are tested for COVID-19 within 72 hours of any procedure, including sedated ABRs and cochlear implants. All other inpatients are tested at admission. Results for testing return within 12-24 hours. Testing is performed via nasal swab quantitative polymerase chain reaction (PCR) with limit of detection of approximately four copies of viral genomic RNA.[9] For patients with unknown or positive COVID-19 testing, PPE includes gowns, gloves, and controlled air purifying respirators (CAPRs). Otherwise, providers wear face shields and surgical masks during all encounters.

**Conclusion**

Care for children who are DHH is essential, even during the COVID-19 crisis. One to two months’ delay can have implications for language and development. During this time, children may “fall through the cracks” as centers reduce their screening or testing.
practices. Establishing criteria for ABRs, audiograms, hearing devices, cochlear implantation or other intervention can help determine what care is essential during the COVID crisis. The practices implemented at SCH provide one model for continued provision of audiologic and otologic care while prioritizing the safety of its patients and providers.

References:


