

# Pediatric Audiology Practice Guidelines (0-5 years)

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Submitted by: CSASK ADHOC Committee  
on Pediatric Audiology Guidelines



## Acknowledgements:

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Audiologists providing services to pediatric clients in the province of Saskatchewan meet the minimum competencies outlined in the CAASPR National Audiology Competency profile May 2018 <http://caaspr.ca/wp-content/uploads/2018/06/National-Audiology-Competency-Profile.pdf>

Audiologists providing services to pediatric clients in the province of Saskatchewan will adhere to best practice guidelines as outlined in this document. The purpose of this document is to ensure that clients in the 0-5 age group are receiving services that meet or exceed accepted standards. If an audiologist does not have required training or experience to meet established criteria they should refer to an audiologist who does possess these skill sets.

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## **1. IDENTIFICATION**

### **1.1 Background**

Standards of care for audiological practice involving children aged 0 to 5 years are informed by the principles of Early Hearing Detection and Intervention (EHDI) as outlined in the Joint Committee on Infant Hearing 2019 Position Statement

[https://www.audiology.org/sites/default/files/publications/resources/2019\\_JointCommitteeInfantHearing\\_Principles\\_Guidelines4EarlyHearingDetectionInterventionProgrs.pdf](https://www.audiology.org/sites/default/files/publications/resources/2019_JointCommitteeInfantHearing_Principles_Guidelines4EarlyHearingDetectionInterventionProgrs.pdf). The Saskatchewan

Document is based on previous guidelines developed by British Columbia

<http://www.phsa.ca/Documents/bcehpaudiologyassessmentprotocol.pdf> and Ontario

[http://www.caslpo.com/sites/default/uploads/files/PSG\\_EN\\_Hearing\\_Assessment\\_of\\_Children\\_by\\_Audiologist.pdf](http://www.caslpo.com/sites/default/uploads/files/PSG_EN_Hearing_Assessment_of_Children_by_Audiologist.pdf). Any infant or child requiring services will be referred to a pediatric audiologist with

qualifications, training and equipment to complete diagnostic frequency specific air/bone conduction auditory brainstem response (ABR) testing and age appropriate diagnostic behavioural, otoacoustic emissions, immittance/ reflex testing .

### **1.2 Rationale for Identification**

Hearing loss has a significant impact on the speech-language, cognitive, and psychosocial development of the infant and child. Early identification is critical to ensure the best outcomes for all infants and children. Identification of hearing loss can occur within the first month of life. For infants, evaluation will consist of objective measures including otoacoustic emissions (OAEs), frequency-specific ABR and age-appropriate immittance and acoustic reflex measures. Infants assessed in the first month of life are more likely to sleep during their evaluation. This leads to a timely diagnosis if hearing loss is present and minimizes the burden on families of attending repeat testing. ABR thresholds can be used for fitting of amplification if indicated.

Most infants six months of age and older can be tested with conventional behavioural audiological procedures including soundfield and ear-specific testing in the soundbooth, OAEs, and age-appropriate immittance/acoustic reflex measures.

The main goals of hearing assessment for children are:

- To confirm or deny the presence of a hearing loss.
- To provide the most complete audiometric record possible to allow for intervention to proceed as indicated.
- To provide surveillance of hearing thresholds in populations at risk for later onset or progressive hearing loss.

The specific objectives of a hearing evaluation in infants and children are:

- Accurate ear-specific and frequency-specific threshold estimation
- Identification of type of hearing impairment if present (conductive, sensorineural, mixed, neural)
- Identification of children who may require higher order audiological evaluation at a later date (e.g. central auditory processing evaluation)

### **1.3 Resource Requirements**

- An audiometric test environment compliant with current ANSI standards
- Dual channel audiometer capable of presenting pure tone and frequency modulated warbled tone stimuli from 250 Hz through 8000 Hz to profound levels with insert headphones, TDH headphones, bone conductor and soundfield speakers all meeting current ANSI standards
- Visual Reinforcement Audiometry (VRA) system (if evaluating infants and children under 4 years of age)
- Auditory evoked potential system with the capability of measuring OAEs and conducting frequency-specific air and bone conduction testing (If providing ABR testing)
- Acoustic Immittance system with appropriate capabilities for the age of the infant/child evaluated
- Otoscope
- Required single-use disposable supplies
- Infection control materials

All equipment outlined above should be routinely checked to ensure proper function and calibrated annually, when moved or replaced. Manufacturer calibration supplied with newly purchased instrumentation is not considered sufficient for early hearing assessments. For sites providing ABR assessment, the BCEHP Audiology Assessment Protocol specifications and training manual are recommended <http://www.phsa.ca/Documents/bcehpaudiologyassessmentprotocol.pdf>.

The safety and comfort of the infant or child must be of paramount concern. Infants and young children should be supervised throughout assessment by an individual familiar with relevant safety procedures and with adequate training in handling young infants. Workplace safety standards must be observed and considered when establishing site specific protocols.

### **1.4 Best Practice Guidelines**

- The audiologist must ensure they have training and experience evaluating infants and children <5 years of age. This should include coursework in infant and pediatric diagnostic audiology in addition to demonstrated experience and competency with frequency specific

air and bone conduction ABR testing. At this time in Saskatchewan there is no set training guideline for personnel to complete prior to testing infants and pediatric clients. The committee has agreed to defer to the BCEHP guidelines until Saskatchewan specific guidelines are available.

- If an audiologist doesn't have training and experience in this area, they will refer to an audiologist who does have these competencies.
- All assessments will be carried out by CSASK registered audiologists who adhere to the agreed upon guidelines. The rationale consists of several important points ( Based on BCEHP guideline):
  - A. this protocol is technically demanding and contains elements that may be outside conventional experience of many paediatric audiologists
  - B. specialized training is required to maximize understanding of, and to fulfill a highly specific standard of care with many mandatory elements

The following components will be included in all evaluations:

- The audiologist must obtain a complete case history on all clients.
- The audiologist must choose the appropriate evaluation protocols for the client's needs, age and developmental level.
- Evaluation protocols for objective and behavioural evaluation will be based on current best practice. Refer to BCEHP audiology assessment protocol <http://www.phsa.ca/Documents/bcehp> for specific guidelines for audiological evaluation from infancy through early childhood.
- The audiologist will ensure complete documentation of records on each client in their care. This includes consent, case history, evaluation results and correspondence with the family and/ or other care providers.
- The audiologist must refer to the appropriate professionals when presenting conditions are outside area of competency for an audiologist.
- The audiologist will communicate results clearly to the family of the client including implications for development.
- The audiologist will communicate recommendations clearly to the family of clients.
- The audiologist will refer the family to community-based resources as indicated by client need.
- The audiologist will always include the family in any decisions regarding the care of their infant or young child.
- The audiologist will discharge the child from care when evaluation and/or treatment goals are met.

- The audiologist will obtain a medical consent for amplification signed by an otolaryngologist or family physician before fitting amplification on the child.

#### Saskatchewan Specific Guidelines

The Joint Committee on Infant Hearing ( JCIH 2019 ) targets of 1-3-6 with 3 months for diagnosis continue to stand but the goal in Saskatchewan to have infants diagnosed by one month of age if possible. Infants are more likely to nap if their evaluation occurs within the first month of life. In addition, if the infant has Cytomegalovirus, identification within the first few months of life is critical to outcomes related to hearing. For any infant, the earlier hearing loss is identified, the earlier intervention can begin. This leads to better outcomes for all aspects of the child's development.

#### References:

BC Early Hearing Program Audiology Assessment Protocol Version 4.1 November 2012

Retrieved April 24, 2019 from

<http://www.phsa.ca/Documents/bcehpaudiologyassessmentprotocol.pdf>

CASLPO Practice Standards and Guideline for Hearing Assessment of Children by Audiologists March 2018 reformatted. Retrieved April 24, 2019 from

[http://www.caslpo.com/sites/default/uploads/files/PSG\\_EN\\_Hearing\\_Assessment\\_of\\_Children\\_by\\_Audiologist.pdf](http://www.caslpo.com/sites/default/uploads/files/PSG_EN_Hearing_Assessment_of_Children_by_Audiologist.pdf)

Joint Committee on Infant Hearing Year 2019 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs . Retrieved January 4, 2020 from

[https://www.audiology.org/sites/default/files/publications/resources/2019\\_JointCommiteeInfantHearing\\_Principles\\_Guidelines4EarlyHearingDetectionInterventionProgrs.pdf](https://www.audiology.org/sites/default/files/publications/resources/2019_JointCommiteeInfantHearing_Principles_Guidelines4EarlyHearingDetectionInterventionProgrs.pdf)

## **2. Intervention: Amplification**

### **2.1 Guideline Principles**

The Saskatchewan Pediatric Audiology Amplification guideline is based on four key principles:

- The guideline is science-based. The content of the protocol is based on the best-available scientific evidence in the field of pediatric amplification whenever possible.
- The provision of amplification should occur at the earliest possible time after the confirmation of hearing loss to minimize the negative developmental consequences associated with untreated hearing loss.
- The goal of providing hearing aids for infants and young children should be to make speech audible and, in cases of unilateral hearing loss, to promote binaural hearing when possible. Candidacy decisions about amplification are based on the degree to which audibility is reduced by the child's hearing loss and hearing aid verification is designed to confirm that audibility of speech has been optimized with amplification.
- The provision of amplification for infants and young children is a partnership between the parents/caregivers, audiologists, otolaryngologists and early intervention providers.

The Saskatchewan Pediatric Amplification guideline is based on the comprehensive Protocols established by Ontario

[https://www.uwo.ca/nca/pdfs/clinical\\_protocols/IHP\\_Amplification%20Protocol\\_2019.01.pdf](https://www.uwo.ca/nca/pdfs/clinical_protocols/IHP_Amplification%20Protocol_2019.01.pdf)

<https://www.dslio.com/>

and BC Early Hearing Program.

### **2.2 Competencies and Facility Requirements**

#### **A. Personnel; Test Environment; Equipment, Supplies and Calibration:**

The guideline lists standard competencies and facility requirements for pediatric audiology and amplification.

Hearing aid fittings and verification will be done in an audiometric environment that satisfies the current ANSI standards and complies with accepted audiology infection control

<https://canadianaudiology.ca/wp-content/uploads/2016/11/Infection-Prevention-and-Control-Guidelines-for-Audiology.pdf>.

Clinics providing infant and pediatric services must have all hardware (e.g. otoscope, audiometer, computer, verification equipment), software (e.g. NOAH database, hearing aid programming



software), consumables and supplies (e.g. specula, probe tubes, foam eartips, pediatric BTE parts) listed in section 1.3 of the BCEHP Amplification Protocol 2018. The guideline mandates that audiometric equipment must be installed by a qualified/certified audiometric instrument specialist, authorized and trained by the equipment manufacturer, and calibrated according to current ANSI™ Standards for audiometers. All equipment must be maintained in accordance with the calibration requirements outlined in the Saskatchewan Hearing Aids Sales and Services Regulation document <http://www.qp.gov.sk.ca/documents/English/Regulations/Regulations/H2-01R1.pdf>

## **B. Data and Documentation**

All clinical data and documentation must be maintained in accordance with the requirements outlined in the CSASK Documentation and Record Management Guideline ([https://CSASK.web.thentiaqa.com/wp-content/uploads/2018/04/Documentation\\_and\\_Record\\_Management\\_Guidelines\\_-\\_Final\\_May10\\_2016.pdf](https://CSASK.web.thentiaqa.com/wp-content/uploads/2018/04/Documentation_and_Record_Management_Guidelines_-_Final_May10_2016.pdf)) and retained in the child's record. Documentation requirements include: client personal information, clinical visit dates, medical clearance date, audiometric results, immittance results, OAE results, RECD measurement values, ear-specific hearing device model/serial numbers, and hearing aid verification printouts with prescriptive method Desired Sensation Level (DSL™V.5), and hearing aid validation information.

The information will be used to determine eligibility for funding, confirm accuracy of invoicing, and track intervention services. Information about individual children may be shared with other professionals who provide services to families as part of the program. These professionals may include other hearing clinics, hospitals, health units, child development centers, early intervention programs, and education centers. Consent to the disclosure of personal health information to other professionals will be obtained in accordance with provincial Health Information Protection regulations <https://publications.saskatchewan.ca/#/products/10368> .

### **2.3 Amplification Candidacy and Audiological Data**

The guideline determines candidacy for amplification by considering the Degree of Hearing Loss and Speech Intelligibility Index (SII) Value, Medical Clearance, Age at Fitting, Audiometric Thresholds, and RECD.

Children with unaided Speech Intelligibility Index (SII) values  $\leq 80$  in at least one ear should be considered candidates for amplification, binaural amplification is recommended for all infants with confirmed permanent hearing loss in both ears ( $SII \leq 80$  for both ears), and includes any hearing loss for which there is reasonable evidence that a child's development will be compromised without intervention.

With medical clearance from an Otolaryngologist or Otologist, provision of amplification by six months of age (corrected age) is recommended by the Joint Committee on Infant Hearing Position

Statement (JCIH 2007,2019) in most cases. Fitting of amplification should be based on a minimum of two confirmed thresholds per ear (2000 Hz and 500 Hz). If moderately severe to profound hearing loss is clearly confirmed by ABR and auditory neuropathy spectrum disorder (ANSD) has been ruled out, the client and family should be referred to the appropriate services for cochlear implant candidacy assessment and consultation. RECD must be measured for each child and applied to hearing aid verification measures unless contraindicated.

### **Amplification For Different Types Of Hearing Loss:**

This guideline identifies important considerations for the provision of amplification for infants and young children with:

- Unilateral Hearing Loss (UHL) - aidable and unaidable
- Mild Bilateral Hearing Loss (MBHL): PTA of 20 to 40 dBHL in both ears
- Long-term Temporary Conductive Hearing Loss (CHL)
- Auditory Neuropathy Spectrum Disorder (ANSD)

### **2.4 Contralateral Routing Of Sound (CROS), Bone Conduction Devices And Bimodal Stimulation**

The guideline recommends individualized decisions regarding CROS devices (air conduction or bone conduction) for young children 0-5 with severe or profound unilateral hearing loss (UHL). This is an area of audiology practice which is evolving rapidly. Any decisions regarding an individual infant or child will be evidence-based.

Bone Conduction devices should be considered for unilateral and bilateral CHLs, and for mixed hearing losses (BC PTA < 45 dBHL) that can't be fit with a BTE. Bilateral Bone Conduction devices may be indicated for bilateral conductive losses but benefit should be clearly established for individual clients prior to recommending purchase. Conductive hearing loss must be shown to be long term (lasting a period of six months or more) and medical clearance provided by an otolaryngologist or otologist prior to proceeding with intervention.

Evidence suggests that Bimodal Stimulation is beneficial to children and adults for speech recognition and sound localization, and children who receive a unilateral cochlear implant and have residual hearing in the opposite ear should be considered candidates to continue to use conventional amplification in the non-implanted ear.

### **2.5 Criteria for Hearing Instrument Selection**

Hearing instruments chosen for inclusion in the guideline have a number of features that are mandatory and/or desirable for pediatric hearing aid fittings. These include non-electroacoustic characteristics of BTEs (e.g. compatibility with RM-HAT, tamper-proof BTE hooks and battery doors,

IP68 moisture resistance rating, parental controls and indicators) and important electroacoustic characteristics (e.g. sufficient gain to meet target levels using DSL™V.5 prescriptive method, flexible fitting range). These features are outlined in the following sections:

## **2.6 Earmolds: Style, Material, Tubing**

This guideline defers to audiologist's discretion for choice of style, but states that shell style earmold with no vent is often recommended for infants in order to maximize retention, durability, and avoid feedback. A helix-lock may help if retention is a problem, but caution parents to ensure proper insertion. For older children, venting may be desired depending on the degree and configuration of the child's hearing loss and to avoid unnecessary occlusion of the ear canal.

The guideline identifies the two main choices of pliable earmold material to be considered for infants: PVC (vinyl) or Silicone, with consideration for any allergies. PVC is stiffer and can allow tubing to be glued so may be preferable for children less than six months of age, or for children with unusually small ear canals.

## **2.7 Verification of Electroacoustic Characteristics**

The Desired Sensation Level Method (DSL™ V.5) is the preferred prescriptive method, using in-situ verification (REM) or Simulated Real-Ear Measures (SREM) with Real-Ear to Coupler Difference (RECD) measured or predicted (predicted only to be used when the RECD cannot be measured).

### **Hearing Aid Verification Stimuli And Presentation Levels:**

The guideline recommends hearing aid fittings should be matched within 5dB of prescriptive targets at input levels for soft (55 dB SPL), average (65 dB SPL) and loud speech (75 dB SPL), in addition to Maximum Power Output (85 or 90 dB SPL). SII for soft and average speech should be compared to the normative SII range as per Bagatto et al, 2016. If the hearing aid fitting deviates more than 5dB from prescriptive targets, or SII is outside of the normative SII range, the reason for such deviation should be documented.

## **2.8 Advanced Signal Processing Features: Activation And Verification Of Feedback Suppression, Frequency Lowering, Noise Management And Directional Microphones**

The guideline points out that many advanced signal processing algorithms and features in hearing aids are designed based on adult listening preferences and perception, and there is limited research into benefits for children. To measure the effects of such advanced features, speech-based verification should occur when any advanced processing feature is activated and not using manufacturers' "verification mode," except for verification of the maximum power output (MPO).

Advanced signal processing features can benefit children, but effects on audibility must be quantified when employing any advanced processing features (feedback suppression, frequency lowering, noise management) and such strategies should be activated prior to verification for this purpose. Adaptive directional microphones can provide better auditory

access to speech; however, because young children do not always orient to the talker of interest, they should not be activated until the child is older.

## **2.9 Outcome Validation**

The goal of amplification is to ensure that a child's own speech and that of others is audible, comfortable and clear, and identifies measures for outcome validation for monitoring a child's functional abilities with their hearing aids over time, including behavioral assessment of Aided Speech (Aided/Unaided SAT or SRT, and WRS) and Functional Assessment Questionnaires.

Outcome validation involves ongoing collaboration among the team including qualified early interventionists. Further diagnosis is required when minimal progress in auditory development is identified after a trial with amplification. This may involve a referral for ABR, referral to the Cochlear Implant Program or counselling regarding communication modality.

The Pediatric Audiologic Monitoring Protocol (Bagatto et al., 2011) should be directly referred to via <http://www.dslio.com> for recommended monitoring protocols and forms. The UWOPed AMP Guideline was designed to aid audiologists in monitoring and tracking hearing outcomes for children ages 0-6 years. In addition, the Ped AMP Guideline is regularly updated to adhere to the most current evidence-based practice.

## **2.10 Follow-up Guidelines for Amplification**

The guideline recommends a regular follow-up schedule for audiological appointments which include earmold check, BTE listening check, probe microphone measurements, electroacoustic analysis (ie. ANSI™ Test) and aided behavioural audiometric evaluations.

### **References:**

American Speech and Hearing Association (2000). Principles and Guidelines for Early Hearing Detection and Intervention Programs 2000 Pediatrics. Oct; 106(4):798-817.

American National Standards Institute (1997) S3.5-1997 Methods for calculation of the speech intelligibility index, New York, New York

Bagatto, M.P., Moodie, S.T., Malandrino, A.C., Richert, F.M., Clench, D.A., Scollie, S.d., (2011) The University of Western Ontario Pediatric Audiological Monitoring Protocol Version 1.0, Revision 2. Child Amplification Laboratory, National Center For Audiology UWO. Retrieved from <http://www.dslio.com>

Government of Saskatchewan (1999) . Health Information Protection Act. Retrieved from <https://publications.saskatchewan.ca/#/products/10368>

Government of Saskatchewan (2006). Hearing Aids Sales and Services Regulation document retrieved from <http://www.qp.gov.sk.ca/documents/English/Regulations/Regulations/H2-01R1.pdf>

Interorganizational Group for Speech-Language Pathology and Audiology (2010) Infection Prevention and Control Guidelines . <https://canadianaudiology.ca/wp-content/uploads/2016/11/Infection-Prevention-and-Control-Guidelines-for-Audiology.pdf>

Joint Committee on Infant Hearing. (2007). Year 2007 position statement: principles and guidelines for early hearing detection and intervention programs. *Pediatrics*, 120(4), 898-921. <https://www.ansi.org/> [https://www.cshhpbcc.org/docs/acpg-04\\_-\\_infection\\_prevention\\_and\\_control\\_guidelines\\_for\\_aud.pdf](https://www.cshhpbcc.org/docs/acpg-04_-_infection_prevention_and_control_guidelines_for_aud.pdf)

Joint Committee on Infant Hearing Year 2019 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs . Retrieved January 4, 2020 from [https://www.audiology.org/sites/default/files/publications/resources/2019\\_JointCommitteeInfantHearing\\_Principles\\_Guidelines4EarlyHearingDetectionInterventionProgrs.pdf](https://www.audiology.org/sites/default/files/publications/resources/2019_JointCommitteeInfantHearing_Principles_Guidelines4EarlyHearingDetectionInterventionProgrs.pdf)

McCreery, R., (2018) Amplification Protocol in Collaboration with the BCEHP Amplification Advisory Group. BC Early Hearing Program Amplification Protocol, September 2018 Revision Ontario Ministry of Children, Community and Social Services (2019) Protocol for the provision of Amplification. Retrieved January 4, 2020 from [https://www.uwo.ca/nca/pdfs/clinical\\_protocols/IHP\\_Amplification%20Protocol\\_2019.01.pdf](https://www.uwo.ca/nca/pdfs/clinical_protocols/IHP_Amplification%20Protocol_2019.01.pdf)

### **3. Intervention - Assistive Listening Devices/ Remote Microphone**

#### **3.1 Background and Rationale**

According to the US Food and Drug Administration (FDA), Assistive Listening Devices (ALDs) are defined as a large variety of devices designed to help you hear sounds in everyday activities. Whereas the College of Speech and Hearing Health Professionals of BC define Remote Microphone Hearing Assistance Technology (RMHAT) as a microphone placed close to the talker's mouth where the decibel level of acoustic speech is well above that of interfering noise and reverberation. The resulting high quality signal is delivered to the listening via: Personal HAT such as FM or infrared receiver, sound field loudspeaker or induction loop receiver.

The benefit of ALDs and RMHAT with children who have hearing loss have been well established in the educational setting. We know that these technologies help improve listening in environments with poor signal to noise ratios, when the distance is great between the listener and talker, and when there is reverberation present (AAA, 2011). These benefits may also be applied to home and day care settings to overcome the same issues as in the classroom and to aid in the development of language acquisition (College, 2011).

ALDs and RMHAT need to have guidelines and protocols established to help aid the individuals that will be diagnosing and fitting children of Saskatchewan with amplification.

#### **3.2 Recommendations/Guidelines for CSASK Audiologists**

AAA's Clinical Practice guideline provides clarification in determining candidacy for RMHAT (AAA, 2011). Saskatchewan Audiologists providing RMHAT technology will refer directly to this guideline in the absence of Saskatchewan specific guidelines [https://audiology-web.s3.amazonaws.com/migrated/HAT\\_Guidelines\\_Supplement\\_A.pdf\\_53996ef7758497.54419000.pdf](https://audiology-web.s3.amazonaws.com/migrated/HAT_Guidelines_Supplement_A.pdf_53996ef7758497.54419000.pdf)

##### **Step 1 - Potential candidacy for RMHAT**

Does the child have hearing loss, Auditory Processing Deficit, Learning Disability, Auditory Neuropathy Spectrum Disorder, Language Deficit, Attention Deficit or is an English Language Learner? If so, is there documented evidence of hearing, listening or learning problems?

##### **Step 2 - Considerations**

Acoustic environment, social/emotional, functional and support. If there are no contra-indications move to the next step.

##### **Step 3 - Device Selection**

Involves looking at the audiological information, developmental concerns, child's listening environment and technological issues.

#### Step 4 - Fitting and Verification

After selection of the RMHAT has been completed, the device needs to be verified before it can be fit on a child. Verification includes both audibility and intelligibility.

#### Step 5 - Implementation and Validation

AAA recommends that a RMHAT plan be developed for the child that includes information on orientation, instructions on use and guidelines for an appropriate follow-up schedule. Validation for the RMHAT would include either objective or subjective measurements and should be done in or reflect the child's typical listening environment. Validation tools include self-assessment, observational questionnaires completed by parents or caregivers, and functional evaluations performed in the child's typical listening environment (AAA. 2011).

#### Monitoring

AAA's Clinical Practice guideline also recommends that any child that is fit with a RMHAT device should have it checked regularly to make sure it is working properly. If repairs are needed, this should happen in a timely manner with a loaner provided when possible. A monitoring plan should be established that outlines who will do the monitoring, along with the location and schedule of the monitoring. The child that is using the RMHAT device should be evaluated to see if the child is meeting their auditory and listening goals as well as being able to communicate with their peers (AAA, 2011).

#### References:

College of Speech and Hearing Health Professionals of BC. (2011) Clinical Practice Guideline. Document: CPG(A)-03.

U.S. Food & Drug Administration. (2018) Other Products and Devices to Improve Hearing. Retrieved from [FDA.gov](https://www.fda.gov).

American Academy of Audiology Clinical Practice Guidelines. (2011) Remote Microphone Hearing Assistance Technologies for Children and Youth from Birth to 21 Years. Retrieved from <https://www.audiology.org>.

McCreery, Ph.D. (2018). Amplification Protocol in collaboration with BCEHP Amplification Advisory Group.

## **4.Intervention**

### **4.1 Evidence-based Practice**

- Decisions about intervention planning will be based on evidence rather than on beliefs or philosophy
  - Evidence includes information from current research, assessments, objective and subjective outcome measurements, as well as family observations and values
  - Decision making will be based on assessment at regular intervals

### **4.2 Family-centred Care**

- Family-centred Care refers to the principle and practice that puts the family at the heart or centre of services, recognizing family strengths and competence.
  - Core features include:
    - Parent-service relationship that is considered a partnership
    - Family choice and decision making
    - Provision of flexible services
    - Family strength used as a resource
    - Respect of family diversity
    - Empowering assistance

### **4.3 Individualized and Flexible Intervention Services**

- Recognition of uniqueness of every child and family and that no one method, approach or specific curriculum will meet the needs of all families
- Services will be provided by qualified individuals
- Need for telehealth services to reach families and professionals working with families

### **4.4 Support, Communication and Collaboration**

- All reasonable efforts should be made to ensure the family receives all necessary support through the auditory (re)habilitation process. This may include access to services and information within the immediate health care team as well as community based organizations.



- Members of the Early Interventionist Teams serving infants and children will communicate and collaborate with other professionals working with the family to optimize outcomes.

#### **4.5 Recommended Standards for CSASK Audiologists**

##### **Standard 1. Initiate intervention Services by Age Six Months**

- Infants with hearing loss will begin receiving appropriate Early Intervention Services by six months of age
  - Frequency of service
    - Families of young children and infants with bilateral moderate or greater hearing loss should be seen at frequent regular intervention.
    - Families of young children and infants with bilateral mild losses, unilateral losses or chronic conductive losses should be seen for several initial sessions until amplification is established and then monitored to ensure they are making appropriate progress and that the hearing loss has not changed.
    - Frequency may be adjusted based on individual needs.
  - Outreach programs to develop skills for working with young children with hearing loss should be delivered by the specialist with Audiological Intervention Qualifications.

##### **Standard 2. Provide Full and Unbiased Information**

- Caregivers will be provided full and unbiased information about options for their children. Audiologists providing pediatric services will be familiar with evidence regarding potential benefit and limitations of recommended interventions and counsel caregivers in this regard. Audiologists will also be familiar with organizations in the community offering services to infants and children with hearing loss and their caregivers and help direct families to services at their request.

##### **Standard 3. Referral Process**

- The referral for intervention services in the province of Saskatchewan is currently under development.

##### **Standard 4. Assessments**

- Ongoing audiological evaluation will occur as indicated by individual client needs.

##### **Standard 5. Individualized Family Service Plan (IFSP)**

- Where significant hearing loss is identified, the audiologist should collaborate with the family to develop an IFSP addressing the following outcome areas:
  - Auditory development
  - Communication and language development
  - Cognitive development
  - Speech development
  - Social-emotional development
  - Emergent literacy development
  - Other (e.g. motor)
  
- The IFSP should identify appropriate objective and subjective measures for tracking the outcome areas and be regularly reviewed with the family.

#### **4.6 Other considerations**

- Access to amplification
  - Audiologists providing pediatric services should work to offer these services in a way which supports timely and unhindered access to amplification and audiological services for all children and their families.

***Adapted from BC Early Hearing Program***

## **5. Remote Services and Telehealth**

### **5.1 Background and Rationale**

The American Speech-Language Hearing Association (ASHA) defines telepractice as the delivery of services through videoconferencing by audiologists and speech-language pathologists (ASHA, 2014). Telehealth is becoming widely used by audiologists and other health professionals across Canada and the United States. This may be attributed to increasing advancements in technology and improved internet access in remote communities (Houston, Behl, & Mottershead, 2018).

Saskatchewan has many rural and remote communities which makes providing timely and consistent service to children with hearing loss difficult. The implementation of telepractice may allow audiologists and early interventionists to provide regular service without the restriction of travel and disruption to family schedules. Telepractice can improve access to care for families who must travel great distances with young children to receive timely diagnosis or regular services. As a result, this may increase family commitment to services and decrease loss to follow up (Houston et al., 2018).

### **5.2 Telepractice in Audiology**

Teleaudiology utilizes telecommunication technology to deliver diagnostic audiological and treatment related service (Houston et al., 2018). The use of telepractice in audiology has been evaluated and is supported as a reliable service delivery model (Cohn and Cason, 2012; Hatton et al, 2019; Swanepoel and Hall, 2010). The province of Saskatchewan's newborn infant hearing screening program has a goal to screen all infants by one month of age, diagnose hearing loss by three months of age, and initiate early intervention by six months of age. The use of teleaudiology in the province of Saskatchewan would allow these timelines to be met by connecting families who live in rural and remote areas with audiologists who specialize in working with pediatrics.

### **5.3 Teleintervention for Children with Hearing Loss**

Teleintervention (TI) utilizes telecommunication technology to deliver early intervention services to families (Houston et al., 2018 ). TI is becoming a more commonly used method of providing early intervention services to families with children who are D/deaf or hard of hearing (Houston et al. 2018). Evidence to support the effectiveness of TI comes from a study by Behl et al. (2017) that found children who received TI had statistically significant language outcomes when compared to children who received in-person intervention. According to the BC Early Hearing Program (2014) children with a bilateral moderate or greater hearing loss should receive weekly intervention and children with a bilateral mild hearing loss should receive several initial sessions with periodic monitoring based on progress thereafter. The frequency of sessions required to meet best practice guidelines may not be feasible for families who live in remote or rural communities due to

increased travel time and disruption of family routine. The use of TI may be a solution to maintaining a consistent therapy schedule that meets best practice guidelines for all children with hearing loss including those who live in rural or remote areas in Saskatchewan.

#### **5.4 Recommendations/Guidelines for CSASK Audiologists**

Please refer to the link below for the full length version of Speech-Language & Audiology Canada's (SAC) position and suggested guidelines for use of telepractice for audiologists.

[https://www.sac-oac.ca/sites/default/files/resources/sac\\_telepractice\\_position\\_paper\\_english.pdf](https://www.sac-oac.ca/sites/default/files/resources/sac_telepractice_position_paper_english.pdf)

## References:

American Speech-Language -Hearing Association. (2014) Telepractice: An Overview and Best Practice. Retrieved February 27, 2019 from <https://pubs.asha.org/doi/10.1044/aac23.1.4>

B.C. Early Hearing Program (2014) Intervention Guideline.

Behl, D. D., Blaiser, K., Cook, G., Barrett, T., Callow-Heusser, C., Brooks, B. M., Dawson, P., Quigley, S., & White, K. (2017). A multisite study evaluating the benefits of early intervention via telepractice. *Infants & Young Children*, 30(2), 147-161.

Cohn, E. R., and Cason, J. (2012). Telepractice: A wide-angle view for persons with hearing loss. *The Volta Review*, 112 (3), 207-226.

Hatton, J., Rowlandson, J., Beers, A., Small, S., (2019). Telehealth-enabled auditory brainstem response testing for infants living in rural communities; the British Columbia Early Hearing Program experience. *International Journal of Audiology*, 58(7), 381-392.

Houston, K. T., Behl, D., Mottershead, S. (2018). Using Telepractice to Improve Outcomes for Children who are Deaf or Hard of Hearing and their families. A Resource Guide for Early Hearing Detection and Intervention. Retrieved from: [http://infanthearing.org/ehdi-ebook/2018\\_ebook/17%20Chapter 17 Using Telepractice 2018.pdf](http://infanthearing.org/ehdi-ebook/2018_ebook/17%20Chapter%2017%20Using%20Telepractice%202018.pdf)

Speech-Language and Audiology Canada. (2006). SAC Position Paper on The Use of Telepractice for SAC SLPs and Audiologists. Retrieved on February 27, 2019 from [https://www.sac-oac.ca/sites/default/files/resources/sac\\_telepractice\\_position\\_paper\\_english.pdf](https://www.sac-oac.ca/sites/default/files/resources/sac_telepractice_position_paper_english.pdf).

Swanepoel, D. W., & Hall, J.W. (2010). A systematic review of telehealth applications in audiology. *Telemedicine and e-Health*, 16(2), 181-200.

## **6. Advocacy**

Saskatchewan does not provide dedicated funding or subsidy for hearing aids, assistive technology, batteries or therapy. Families covered by provincial Supplementary Health or Family Health Benefits, or federal Non Insured Health Benefits have coverage for conventional hearing aids with pre approval every five years. Families with third party insurance may have all or part of conventional hearing aids and services covered . The audiologist should encourage families to check their existing policies to determine the extent of coverage.

If a family does not have coverage, the audiologist should direct them to available external funding sources who may assist with the cost of hearing aids, assistive technology or therapy. Potential funding sources include:

- Saskatchewan Royal Purple and Elks
- Kinsmen Foundation
- Jordan's Principle ([www.canada.ca>jordans-principle](http://www.canada.ca/jordans-principle))
- Manufacturer's hearing foundations

The audiologist should provide a letter in support of a funding request if it is required including rationale for choice of device/service, estimated cost and expected benefit to the client.

The audiologist should direct parents to agencies that provide resources for families with young hearing impaired children. These agencies may include providers of direct treatment services, education and family support networks. These agencies would include but are not limited to the following:

- Saskatchewan AG BELL <http://www.saskagbell.ca/index.php>
- SPARC ( Saskatchewan Pediatric Auditory Rehabilitation Centre) <http://healthsciences.usask.ca/sparc/>
- Saskatchewan Deaf and Hard of Hearing Services (SDHHS)<http://sdhhs.com/>
- Saskatchewan Cochlear Implant Program - Room 25 Ellis Hall Royal University Hospital 306-655-1320
- Saskatchewan Public and Separate school divisions <https://www.saskatchewan.ca/residents/education-and-learning/prek-12-education-early-learning-and-schools/supporting-students-with-additional-needs>

\*This is not a complete listing of agencies.

The audiologist should become familiar with the available resources related to advocacy for hearing impaired children and their families at the provincial, national and international level.

Useful Canadian links are provided below:

- Speech Language and Audiology Canada <https://www.sac-oac.ca/professional-resources/sac-action>
- Canadian Academy of Audiology <https://canadianaudiology.ca/what-we-do/advocacy/>
- Hearing Foundation of Canada <http://www.hearingfoundation.ca/>
- Canadian Infant Hearing Task Force <http://www.infanthearingcanada.ca/>
- Saskatchewan AG BELL <http://www.saskagbell.ca/>
- Elks and Royal Purple Canada <https://www.elksofcanada.ca/>