

# Intervention to Increase Pediatric Hearing Aid Use

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# Disclosures

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## Financial

- I received an honorarium and reimbursement for travel to present at the conference

## Non-financial

- None

# Agenda

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Inconsistent hearing aid use



Hearing aid management  
challenges



Caregiver interventions to increase  
use



AUDITOR  
Y



LANGUA  
GE



COGNITI  
VE

Early  
childhood

A critical  
period for  
development

Auditory  
experience  
impacts  
language  
development  
(e.g., McCreery & Walker, 2021)

Early fitting

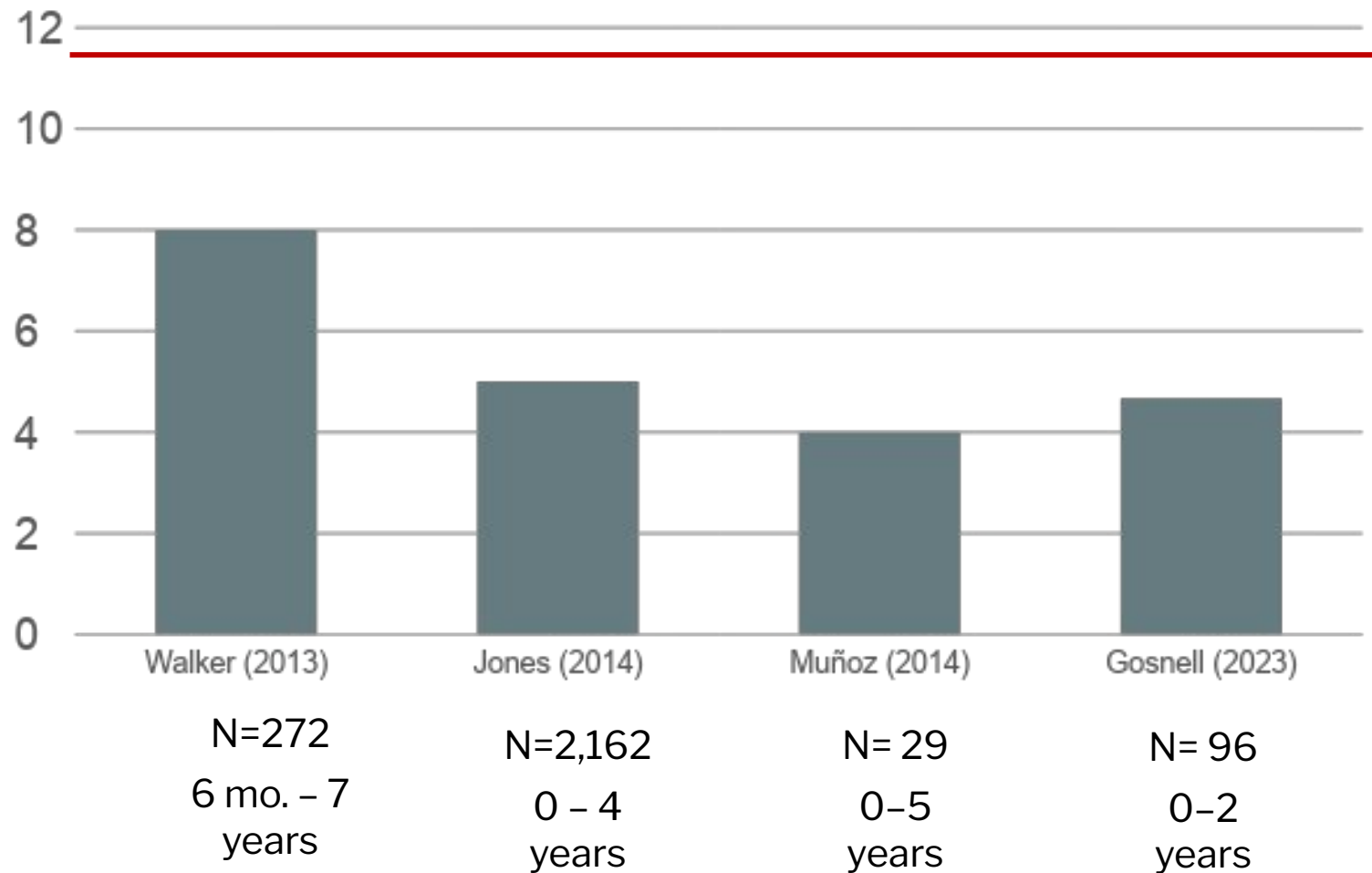
Fitting to prescribed targets

Hours of use

BETTER LANGUAGE OUTCOMES WITH 10+ HOURS OF  
HEARING AID USE PER DAY  
(TOMBLIN ET AL., 2015)

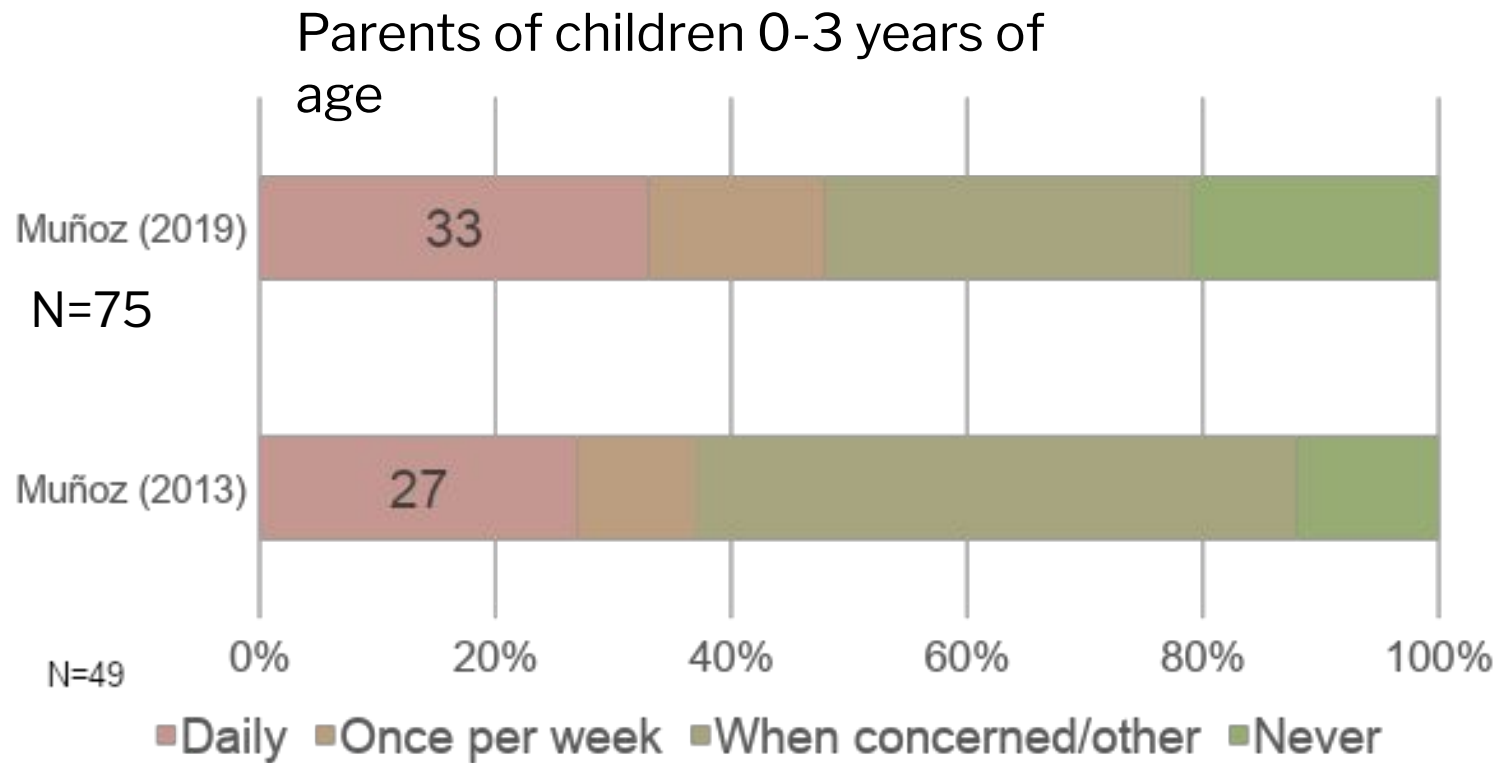


## Low Average Hours of Daily Hearing Aid Use



# Infrequent device listening checks

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# Parents need more help

(Nichols et al., 2022)

*“What parts should we be cleaning? What should we be looking for?”*

*“I usually grab his hearing aid and put it up to my ear... is that an effective method... or should I be using this listening tube?”*

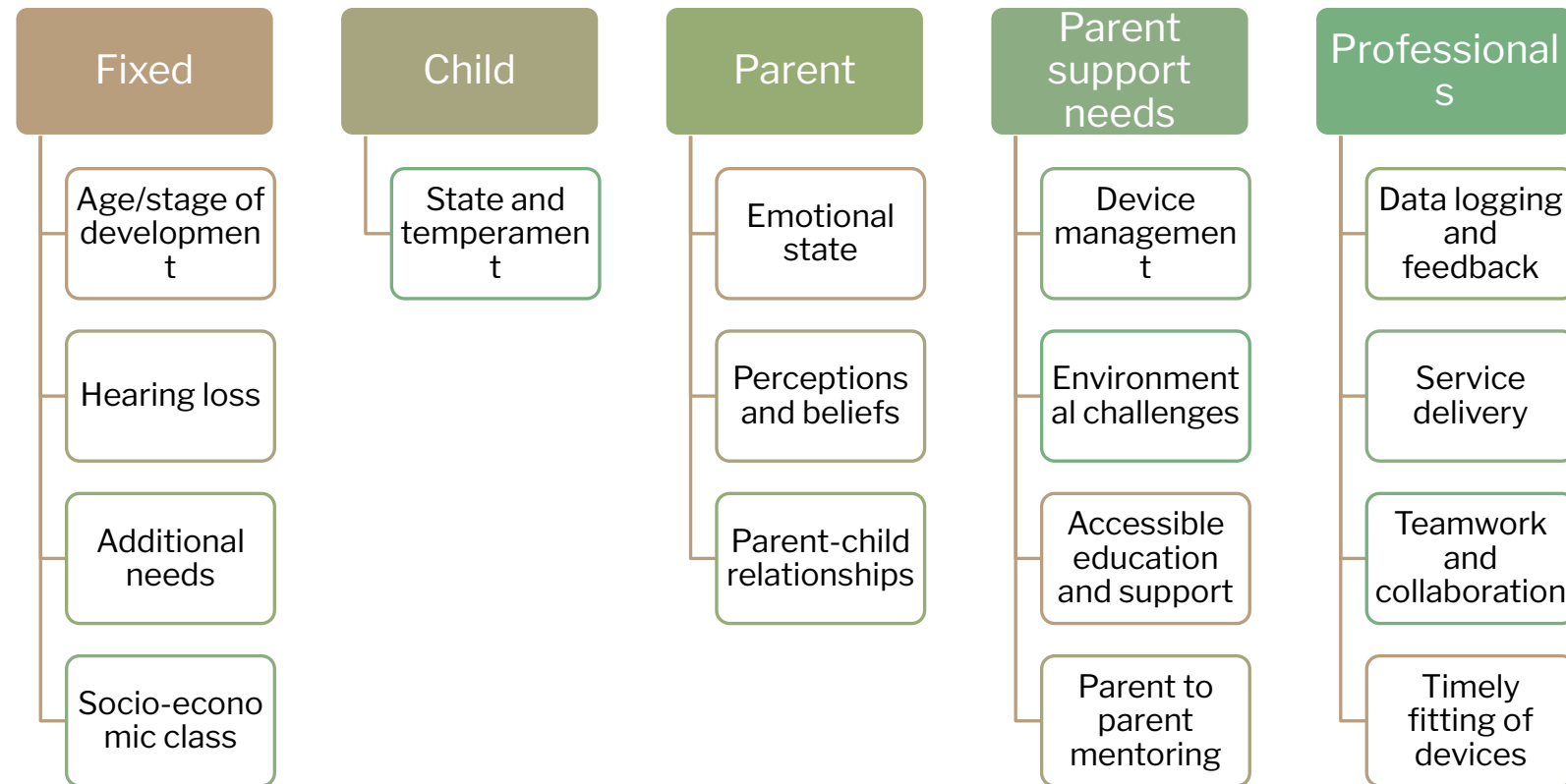
*“I didn’t get any information like she [audiologist] just gave me the backpack and was like ‘here, there you go’”*

*“The audiologist tries to explain but it’s a lot of information when you’re in an appointment”*

*“I didn’t know how to clean it [hearing aid] before this video at all... they [audiologist] handed it to you like ‘there’s a tool in there to clean this, this and this’ and I never cleaned it because I wasn’t sure how to go about it”*

# Scoping review: factors affecting hearing aid use from 25 studies (Nailand et al., 2021)

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# Parent Challenges

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## Problems with Adherence are understandable

Child's hearing loss is often unexpected

Most parents have typical hearing

Parents are unfamiliar with hearing loss  
and hearing aids

Parents experience emotional and  
practical challenges

# Parent reported struggles

(Muñoz et al., 2015 & 2016; Caballero et al., 2017; Nichols et al. 2022)

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Child  
behavior

Routines

Fear and  
uncertainty

Depression  
and anxiety

Frustration  
and lack of  
confidence

Not enough  
information  
and training

## Examples from an eHealth coaching study

(Nichols et al., 2022)

*“I would come [to daycare] or my husband would come to pick him up and they would be like ‘uh, his hearing aid is somewhere’ and... would have to go find it”*

*“I need to do a better job... with my mother. She’s just not comfortable. She’s afraid she’s going to mess it [hearing aids] up*

*“it’s just so overwhelming... I always describe it as drowning... I remember her [audiologist] talking and... shaking my head like ‘you have to pay attention this is important’. There was just so much information at one time”*

*“I think it’s frustrating because we don’t really know... how much these hearing aids are helping”*

# Examples from an interview study

Muñoz et al. (2023)

*“Estoy preocupada de que los otros niños que nunca han visto se burlen de él o le dejen afuera por ser diferente”*

I am worried that the other children who have never seen him will make fun of him or leave him out because he is different.

*“Nada más me mostraron como la primera vez”*

They [audiologist] just showed me how the first time

*“me lo ponga en el oído y si escucho el sonido...yo realmente yo no sé si el audífono está funcionando”*

I put it in my ear, and if I hear the sound...I really don't know if the hearing aid is working

# Psychosocial challenges

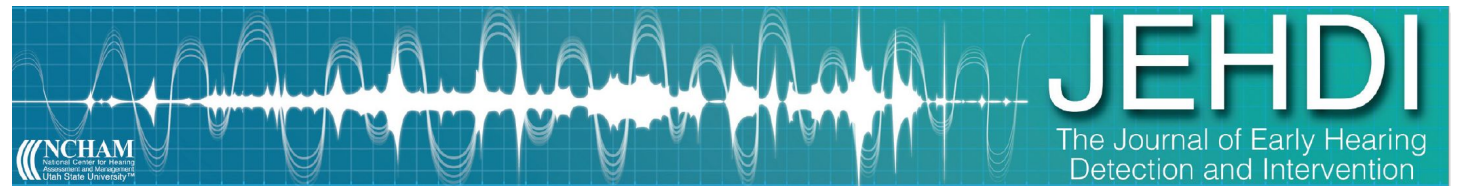
9 articles

**Stress** (5): negatively influenced child outcomes - mothers and fathers need social support

**Self efficacy** (2): higher for CI than HA, mothers than fathers - correlated with taking needed actions

**Depression** (1): almost 1/2 depressed

**Psychological inflexibility & depression** (1): ~1/4 depressed - hearing loss specific psychological inflexibility instrument needed



2021; 6(1): 90-95

## Psychosocial Experiences of Parents of Young Children who Use Hearing Devices: A Scoping Review

Karen Muñoz, EdD<sup>1</sup>  
Natalie Nichols, BS<sup>1</sup>  
Sydnee Hill<sup>1</sup>

<sup>1</sup>Utah State University, Logan, UT





How many of  
you have  
heard of  
psychological  
inflexibility?

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# Psychological inflexibility

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An individual's response to difficult internal experiences (e.g., emotions, thoughts) in a way that is maladaptive


Gets in the way of taking desired actions

Can interfere with achieving desired intervention outcomes

Parents can experience thoughts and emotions that interfere with taking actions to address their child's hearing problem.



For example, they may have negative thoughts or uncomfortable feelings about hearing aids and not put them on their child.



Understanding underlying barriers is needed to effectively target education and support.

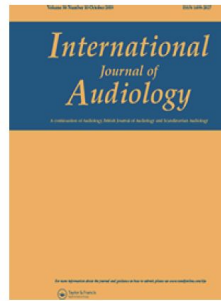
**Why are we talking about psychological inflexibility in audiology?**

# Hearing loss specific instruments developed and validated

Adults with hearing loss  
(N = 264)

Primary caregivers of  
children with hearing  
loss

(N = 275)



International Journal of Audiology



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## Measuring psychological inflexibility in adult and child hearing loss

Clarissa W. Ong, John J. Whicker, Karen Muñoz & Michael P. Twohig

## Acceptance and Action Questionnaire—Managing Child Hearing Loss (AAQ-MCHL)

In this questionnaire, we use the term “frustration” to describe negative thoughts and feelings about your child’s hearing loss. Please replace the word “frustration” with thoughts and feelings about your child’s hearing loss that bother you the most.

0	1	2	3	4	5	6
Never True	Very rarely true	Seldom true	Sometimes true	Often true	Almost always true	Always true

1. My frustration with my child’s hearing loss has negatively affected my parenting.
2. I wish I could control negative thoughts and feelings about my child’s hearing loss.
3. I need to manage negative thoughts about my child’s hearing loss to be a better parent.
4. My negative thoughts and feelings about my child’s hearing loss lead me to avoid situations.
5. I worry about what others think of my child’s hearing loss.
6. I suppress negative thoughts and feelings related to my child’s hearing loss.
7. I spend a lot of time thinking how things would be for me without my child’s hearing loss.
8. Frustration with my child’s hearing loss keeps me from effectively treating and managing it.

*Scoring instructions: Sum item ratings to get a total score.*

# Screeners can help identify internal struggles

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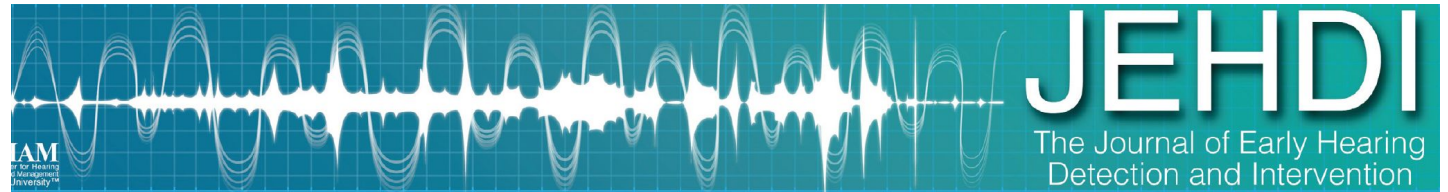
Score ranges from 0 – 48

Higher score means more internal struggles

Four variables signaled higher risk for parents' psychosocial well-being:

- lower income
- presence of other disabilities
- younger child age
- **psychological inflexibility**

Psychological inflexibility was significantly associate with psychological distress and functional impairment



2021; 6(2): 1-8

## **Factors Associated with the Psychosocial Well-being Among Parents of Children who are Deaf or Hard of Hearing**

Karen Muñoz, EdD<sup>1</sup>  
John J. Whicker, PhD<sup>2</sup>  
Clarissa W. Ong, PhD<sup>3</sup>  
Michael P. Twohig, PhD<sup>3</sup>

# To help, you first need to understand

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1

What are parents' internal experiences (thoughts, feelings, emotions)?

2

How are they interfering with hearing aid management?

# To find out...

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Talk about  
their  
struggles

Use a  
screening  
tool



# When you ask about struggles...

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Be a detective - ask open-ended questions

- Funnel down to the underlying issue

Talking it out is therapeutic

Once done talking through it - validate

# Example: identifying underlying issues

(Muñoz & Twohig,  
2024)

Audiologist	Parent
How have things been going with the hearing aids for you?	Ok, there's a lot to get used to, but I think it's going well.
What part of this has been hardest for you?	There were some days that I forgot to put the hearing aids on.
<i>Nods and gives space with silence for parent to expand</i>	I couldn't believe I forgot.
It makes sense this is hard; you aren't in a routine yet. It's common for parents to forget at first.	Yeah, I guess it isn't just me being forgetful. She's just so little.
How are you feeling about her wearing the hearing aids?	It's hard to wrap my head around this; no one in our families has a hearing loss.
You feel uncertain about her hearing loss.	Yeah, I don't know what to think.
What's making you feel uncertain?	Well, my parents don't believe she has a hearing loss.
What else are you feeling?	My husband and I wonder too, I mean she does react when the dog barks.
Alright, it sounds like you and your family have doubts about the hearing loss diagnosis, and it's hard to put the hearing aids on when you are not sure she really needs them. Does that sound right?	

What hesitancies do you have talking about thoughts and emotions with parents?

PAIR AND SHARE

# Common clinician barriers

(e.g., Muñoz et al., 2017; Grigsby et al., 2024)

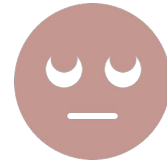
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Worries  
about time



Uncertain  
how to  
respond



Unsure of  
role



Intrusive to  
parent



What  
helps  
parents?

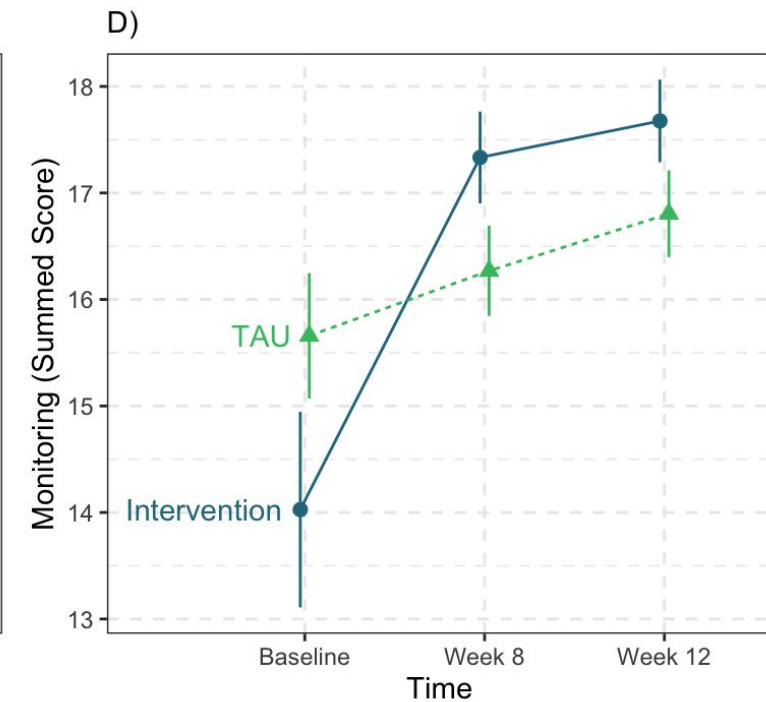
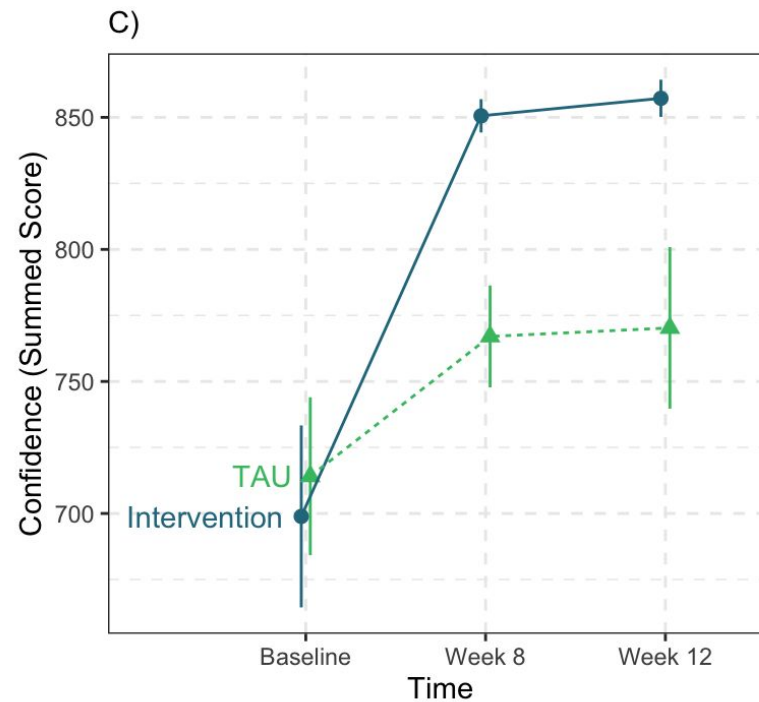
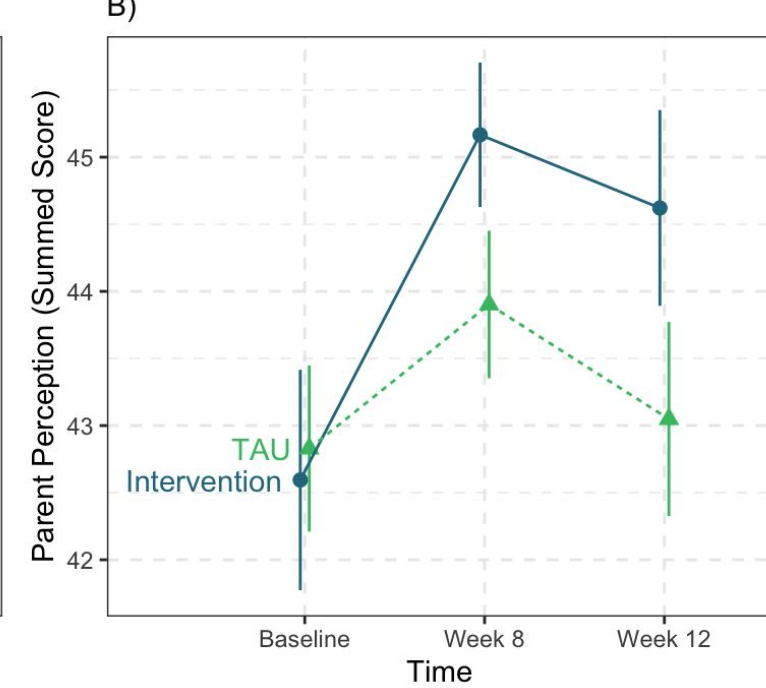
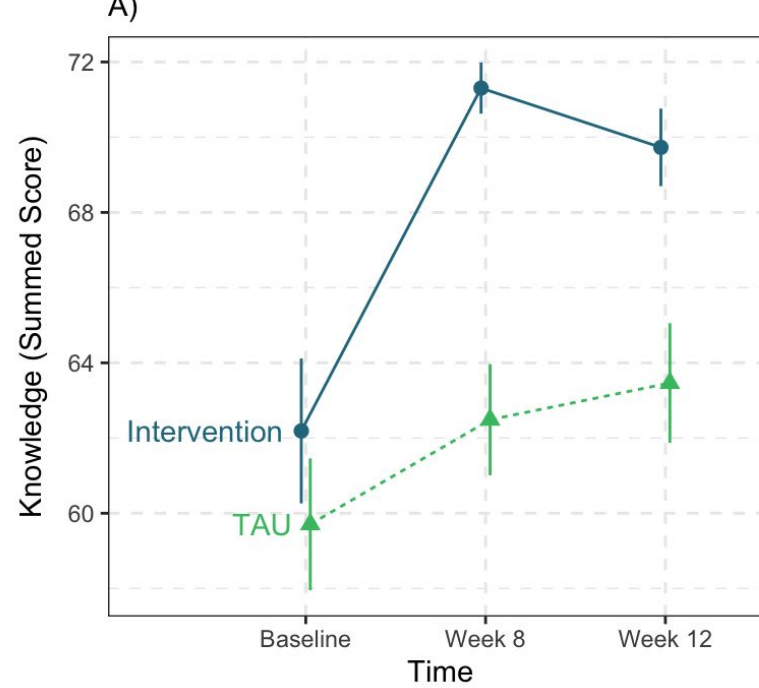
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# EHEALTH 6 WEEKS VIDEOS + COACHING RCT (N=82)

Differential change over time

- Knowledge:  $p = 0.008^*$
- Parent perceptions:  $p = 0.065$
- Confidence:  $p = 0.004^*$
- Monitoring:  $p = 0.004^*$

Muñoz et al. (2021)



# Data logging + education/coaching

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Research	Number of children	Average hours increase	Delivery
Muñoz et al. (2017)	4	3.5	Virtual support
Ambrose et al. (2020)	3	5.9	In-person structured education and support
Muñoz et al. (2023)	3	3	Virtual support

# Muñoz et al., 2017

Supplement to treatment as usual – remote DL + support  
(6 months: initial observation – active problem-solving – monitoring)

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## English

- 2 months – new fitting
  - 13 visits total – 54% virtual
  - DL ranged 2.5 to 19.2
- 24 months – low hours of use
  - Child behavior issue
  - 16 visits total – 44% virtual
  - DL ranged 6.2 to 12.2

## Spanish

- 5 years – low hours of use
  - Father engagement issue
  - 11 visits total - 91% virtual
  - DL ranged 9.4 to 14.9
- 3 years – low hours of use
  - Grandmother engagement issue
  - 15 visits total – 87% virtual
  - DL ranged 2.2 to 8.3



# Ambrose et al., 2020

## Structured protocol - children 14 to 36 months

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- Baseline data logging
- Pre-intervention assessment to identify HA use challenges
- Intervention: workshop, coaching, check-ins
  - Individualized within four topic areas based on pre-assessment
- Post-intervention assessment
- One-month maintenance probe

Hearing aid use increase maintained at one month:

- Dyad 1:
  - ↑ 5.3 hours  
(2.8 to 8.1)
- Dyad 2:
  - ↑ 9 hours  
(2.3 to 11.3)
- Dyad 3:
  - ↑ 3.4 hours  
(0 to 3.4)

# Muñoz et al., 2023

## Single subject ABC design

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- Condition A - baseline
    - 1 week: data logging only
  - Condition B – data logging awareness
    - 2 weeks - parents submitted hours each evening (bedtime)
  - Condition C – coaching + data logging
    - 4 weeks – virtual visit for support
- Child 1: 11 months
    - ↑ 4.4 hours
    - (4.5 to 8.9)
  - Child 2: 4 years **no meaningful change**
    - ↑ 0.49 hours
    - (2.9 to 3.39)
  - Child 3: 3 years
    - ↑ 4.1 hours
    - (6 to 10.1)

# Take aways for helping parents

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01

Individualize  
for each family

02

Purposeful  
process over  
time

03

Check-in on  
progress and  
adjust  
approach as  
needed

04

Flexible  
delivery helps  
(virtual /  
in-person)



What would help you partner with parents on hearing aid management?

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PAIR & SHARE

# Resources

# Our Website English & Spanish

heartolearn.org

oirparaaprender.org

Focused on 0-6 years

Video

Language activities

Infographics



## Resources for Parents and Professionals



En Español

Webinars

Tutorials

Materials

Infographics



Home | About | Families | Contact Us

**Building Success**  
**One Step at a Time**  
Hearing-Language-Literacy



How to Check Hearing Aid Batteries



How to Clean Earmolds



How to Do a Hearing Aid Listening Check



How to Cut Earmold Tubing



How to Replace a Hearing Aid Battery



LEARN NEW SKILLS: SHORT VIDEO DEMONSTRATIONS



Brief videos  
and  
instructional  
tutorials

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1. Provider Guide



2. Coping and Planning



3. Developing New Routines



4. Hearing Aid Use



5. Hearing Aid Care Guide

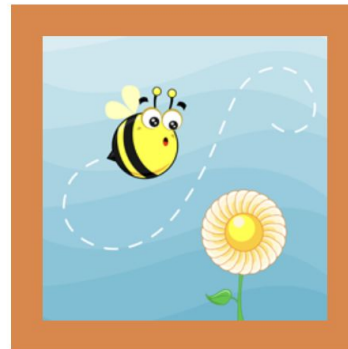


GETTING STARTED WITH HEARING AIDS: A REMOTE PARENT EDUCATION AND SUPPORT PROGRAM

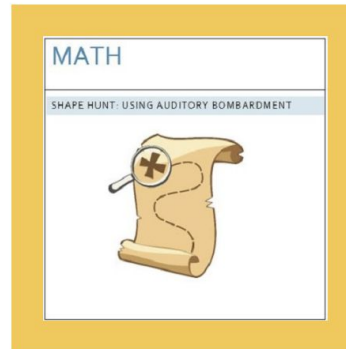




Language



Literacy



Math



Music



LSL Strategies



Featured Projects

# Materials and activities for parents

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## Wearing Hearing Aids improves language skills IF WORN 10 HOURS OR MORE EACH DAY.



Put hearing aids on → When awake

In the car ←



→ At play



Every day

- Sunday
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday

Talk to your audiologist about how best to meet the needs of your family

Reference: Tomblin, J.B., Harrison, M., Ambrose, S.E., Walker, E.A., Clison, J.J. & Moeller, M.P. (2015). Language outcomes in young children with mild to severe hearing loss. *Ear and Hearing*, 36, 765-815. doi: 10.1097/AUD.0000000000000219

## REMOTE MICROPHONES: LEARNING HAPPENS EVERYWHERE!

How do they work?



Why use them?

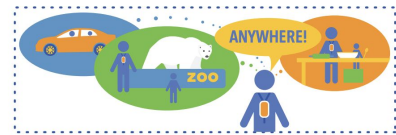
We live in a noisy, active world! Young children need to hear your voice clearer than other noises so they can learn to listen and talk. When you wear a remote microphone your child can hear you even when it is noisy or if they are not near you.



Who should use them?



Where to use them?



Curran, et al. (2019). *JSLHR*, 42(3), 564-576. | Walker, et al. (2019). *IAA*, 58(4), 200-207. | Avivi-Reich, et al. (2020). *JSLHR*, 43(1), 345-35.

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Contributors: Meredith Spraford, Boys Town National Research Hospital; Elizabeth Walker, University of Iowa; Karen Muñoz, Utah State University

## HELP CHILDREN USE AND CARE FOR HEARING DEVICES

Practice these tasks together until you are confident your child can:



- LET YOU KNOW WHEN DEVICES AREN'T WORKING
- REPOSITION HEARING DEVICES IF NEEDED
- STORE THE HEARING DEVICES IN A SAFE PLACE
- PUT DEVICES ON AND TAKE OFF WITHOUT REMINDERS
- CHECK AND CHANGE BATTERIES
- CLEAN AND CARE FOR DEVICES
- IDENTIFY PROBLEMS WITH DEVICES
- CONNECT TO TECHNOLOGY WITH HEARING DEVICE

Age 2 3 4 5 6 7 8 9

Not all children may be ready to do these skills by the ages listed in this guideline. Talk to your child's audiologist for ideas on how to teach your child to independently care for their hearing devices.

Ambrose, S., et al. (2019). Effects of intervention designed to increase toddlers' hearing aid use. *Journal of Deaf Studies and Deaf Education*. Klein, et al. (2019). Effects of grade and school services on children's responsibility for hearing aid care. *American Journal of Audiology*.

Contributors: Meredith Spraford, Boys Town National Research Hospital; Elizabeth Walker, University of Iowa; Karen Muñoz, Utah State University

# Infographics

# Implementing Family-Centered Care in Early Intervention for Children with Hearing Loss: Engaging Parents with a Question Prompt List (QPL)

A new tool for engaging more families in a child's hearing management and development

By KRIS ENGLISH, PhD; ELIZABETH WALKER, PhD; KERRI FARAH; KAREN MUÑOZ, EdD; ANGELA PELOSI, MAUDSA; NERINA SCARINCI, PhD; JANET DESGEORGES; HOLLE AUNGST, AuD; JANE MADELL, PhD; MARY PAT MOELLER, PhD; JOSEPHINE MARRIAGE, PhD; CAROL FLEXER, PhD, and CHRISTINE JONES, AuD

The authors have developed a Question Prompt List (QPL) that can be used by audiologists to encourage families to engage in both fact-based and adjustment-based questions during audiology appointments. The impetus for developing this QPL was to facilitate more family-centered practices in early intervention.

*Editor's Note: As detailed in a June 23, 2017 Hearing Review online news article, Phonak has convened an international expert panel to provide recommendations for Pediatric Family-Centered Audiological Care, marking an expansion of the Phonak Family-Centered Care (FCC) initiative launched in October 2015. The FCC pediatric panel, chaired by Dr Kris English, includes a select group of experts who believe that, in order to provide optimal patient consulting and treatment, audiological care must shift to emphasize both patient and family involvement during the entire treatment process as a means to enhance the value of hearing care services.*

Family-Centered Care (FCC) has long been promoted as best practice in the provision of hearing healthcare services for children who are deaf or hard-of-hearing and their families.<sup>1,2</sup> Although there is some

variation in the definition of FCC among researchers and clinicians, there is consensus in the field of early intervention for children who are deaf or hard-of-hearing that the following 10 best practice principles should be applied:

- 1) Early, timely, equitable access to services;
- 2) Family-provider partnerships;
- 3) Informed choice and decision making;
- 4) Family, social, and emotional support;
- 5) Family-infant interaction;
- 6) Use of assistive technologies and supporting means of communication;
- 7) Qualified providers;
- 8) Collaborative teamwork;
- 9) Progress monitoring; and
- 10) Program monitoring.<sup>3</sup>

In many ways, the early, timely, and equitable access to services for families of children



**Kris English, PhD**, is a professor at the University of Akron/NOAC; **Elizabeth Walker, PhD**, is an assistant professor in the Department of Communication Sciences and Disorders at the University of Iowa in Iowa City; **Kerri Farah, BSc**, is the Clinical Lead at Guy's and St Thomas' NHS, UK; **Karen Muñoz, EdD**, is the Associate Professor of Audiology and Interim Department Head, Communicative Disorders and Deaf Education, at Utah State University; **Angela Pelosi, MAUDSA**, is the Global Head of Pediatrics at Phonak AG, Switzerland; **Nerina Scarinci, PhD**, is a Senior Lecturer in Speech Pathology and Audiology at The University of Queensland; **Janet DesGeorges** is the parent of a deaf daughter and the Executive Director of Hands & Voices, a parent support organization; **Holle**

**Aungst, AuD**, is the Coordinator of Pediatric Audiology at Head and Neck Institute, Cleveland Clinic; **Jane R. Madell, PhD**, is a pediatric audiologist, speech-language pathologist, LSLS auditory-verbal specialist, and consults nationally and internationally on managing hearing in children; **Mary Pat Moeller, PhD**, is Director of the Center for Childhood Deafness, Language and Learning Research at Boys Town National Research Hospital in Omaha, Neb; **Josephine Marriage, PhD**, is the Director of CHEAR (UK) and is a Clinical Scientist in audiology and registered hearing aid dispenser; **Carol**

**Flexer, PhD**, LSLS Cert AVT, is a Distinguished Professor Emeritus of Audiology at the University of Akron; **Christine Jones, AuD**, is the Director of the Phonak Audiology Research Center (PARC) in Warrenville, Ill.

# Childhood Hearing Loss Question Prompt List for Parents

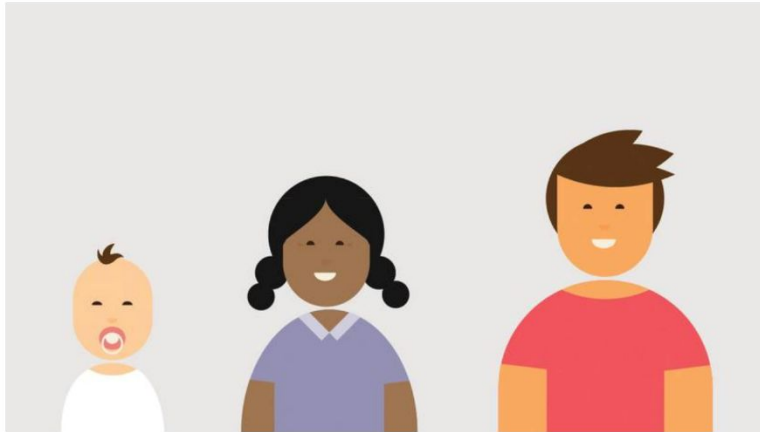
Developed by an international working group (English et al., 2017)

To support family-centered care and engage parents

Available on Phonak website

<https://www.phonakpro.com/us/en/resources/conseling-tools/family-centered-care/fcc-children/family-centered-care-qpl.html>

## Growing Up with Hearing Loss



Growing Up with Hearing Loss is an interactive platform to help children and young adults with hearing loss and their families successfully manage key transitions and use them as opportunities to learn, grow, and discover new things about themselves and the world.

## Growing Up with Hearing Loss Contents



Ida Institute Tools:  
[idainstitute.com/tools/](https://idainstitute.com/tools/)

# Help parents and children plan for transitions

# Questions?

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