

Making a Connection:

Integrating Assistive Devices to Increase the Hearing Aid Wearer's Success

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Hear better. Live better.

Webinar FAQs

Assistive Devices

Michele Hurley, Au.D.

How to Ask a Question:

- Click Q & A, type your question, and Send

Resources Tab:

- Download the course handout
- Link to course information page
- View presenter information

How to view captions:

- Click Show Caption CC Button

How to earn CEUs:

- After the webinar, go to your Pending Courses and pass the multiple-choice exam

For assistance or tech support:

- Call 866-782-9924
- customerservice@audiologyonline.com
- Use the Q&A window

Learner Outcomes

Upon completion of this course, participants will be able to:

1

List two benefits of
Telecoil use

2

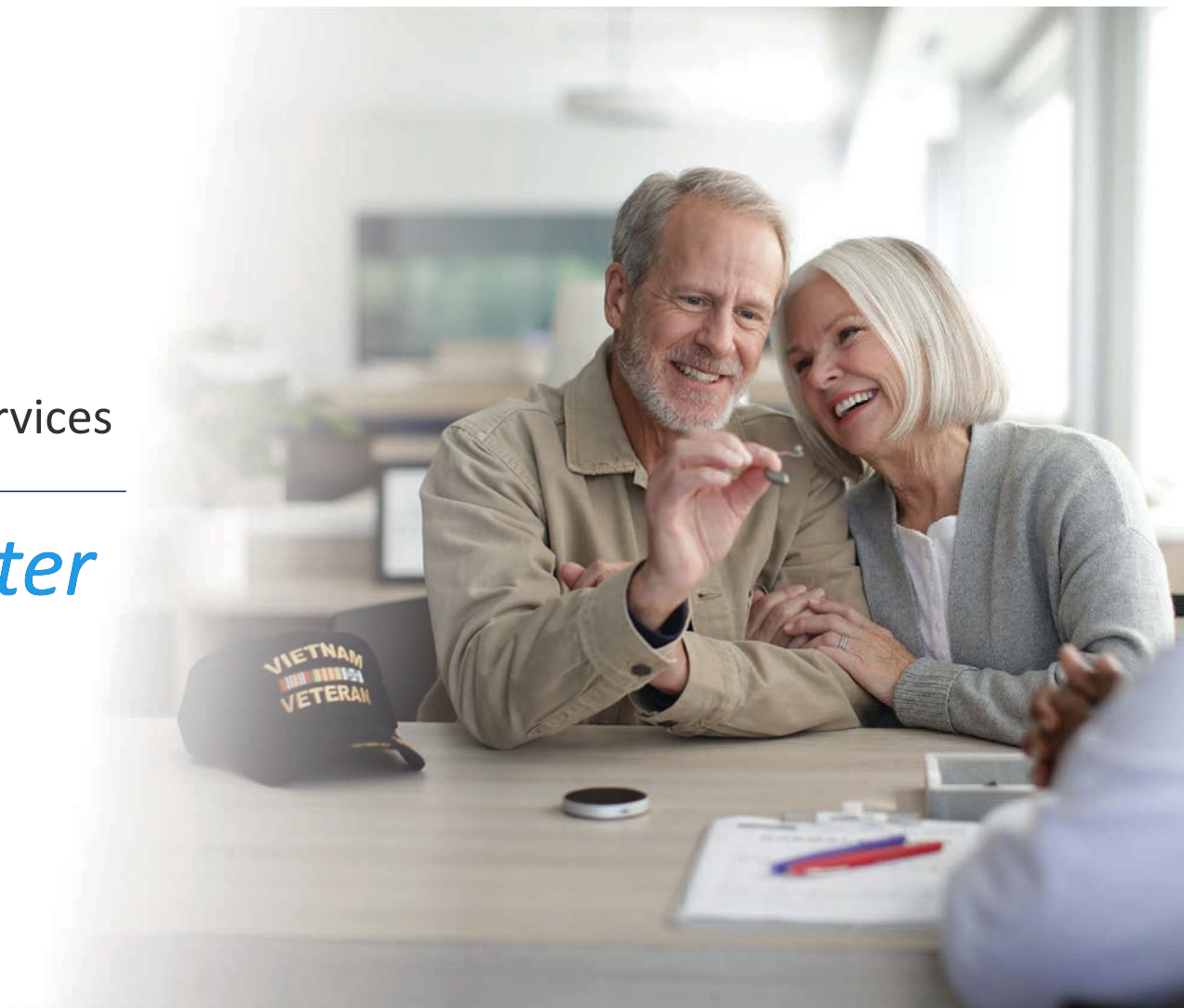
Identify three use cases
for remote microphone
technology

3

List two Speech in
Noise tests to
assess speech
understanding in
noise

Patients seek our services

*To hear **better***



*Effective in **ideal**
listening conditions*



*Break down in
less than ideal
listening situations*





Communication Breakdown



Fast pace



Multiple talkers



Unfamiliar voices



Novel situation

Assistive Listening Technologies

Augmenting and optimizing
the hearing experience





Expanding the Usefulness of Hearing Aids via Assistive Listening Technology





Why recommend Assistive Listening Technology?

Environmental factors



Reverberation



Background noise



Distance



Physical barriers



Why recommend Assistive Listening Technology?

Improving SNR at public venues



Places
of worship



Ticketing
windows



Performance
venues



Information
desks



Meeting
spaces



Airports and
public transit

Older listeners need a **3 dB more** favorable **signal-to-noise ratio** than younger adults on **speech in noise tests**

Pichora-Fuller: Using the brain when the ears are challenged helps older listeners compensate and preserve communication function. 2009

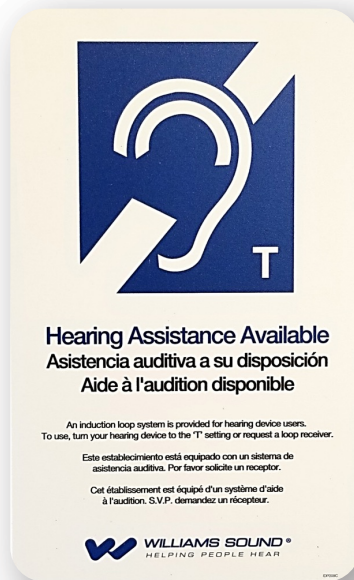


The Americans with Disabilities Act

Adopted in 1990, mandated assistive listening technology in public spaces or workplaces for the hearing impaired



ADA-Mandated Communication in Public Areas



Hearing Loops

Also known as Induction Loops, made up of a copper wire placed within a room, theater or counter which is connected via a special loop “driver” to a public address or sound system. Simple, discreet and user friendly.

FM Systems

Transmit wireless, low power FM frequency radio transmission from a sound system to FM receivers. Requires a receiver and headphone or neck loop. Hearing aids with telecoil and cochlear implants eliminate the need for headphone or neck loop.

Infrared Systems

Work like a TV remote control by sending speech or music from a public address system to a receiver using invisible infrared light waves. Line of sight. Requires a receiver and headphone or neck loop. Hearing aids with telecoil and cochlear implants eliminate the need for headphone or neck loop.



Telecoil

When available on a hearing aid, the telecoil can “listen” instead of the microphone.

Made of copper wire coiled and placed in the hearing aid, it is sensitive to magnetic fields from the telephone, sending the signal to the amplifier, bypassing the hearing aid microphone.



Looped System

“Looping” uses the telecoil in the aid to connect the copper wire in the space to the hearing aids to enhance hearing and understanding, typically in large, public spaces.

Benefits of Telecoils & Looping



When Was the Telecoil Invented?

The patented magnetic induction coil communication system was invented in Great Britain by Joseph Poliakoff in 1937



“Is TeleCoil and Looping technology obsolete in today’s digital world?”

A 2022 study showed only 29% of homes have a landline and many businesses are piggybacking their phones on their internet connections.

Telecoil and loop systems remain the most proven and effective assistive systems for hearing aids-today.

Benefit of Looped and Telecoil Technology



Airport Departures Hall

Microphone

Induction Coil

Airport Baggage Claim



Historic Chapel



Telecoil Preference



13 CIC Users



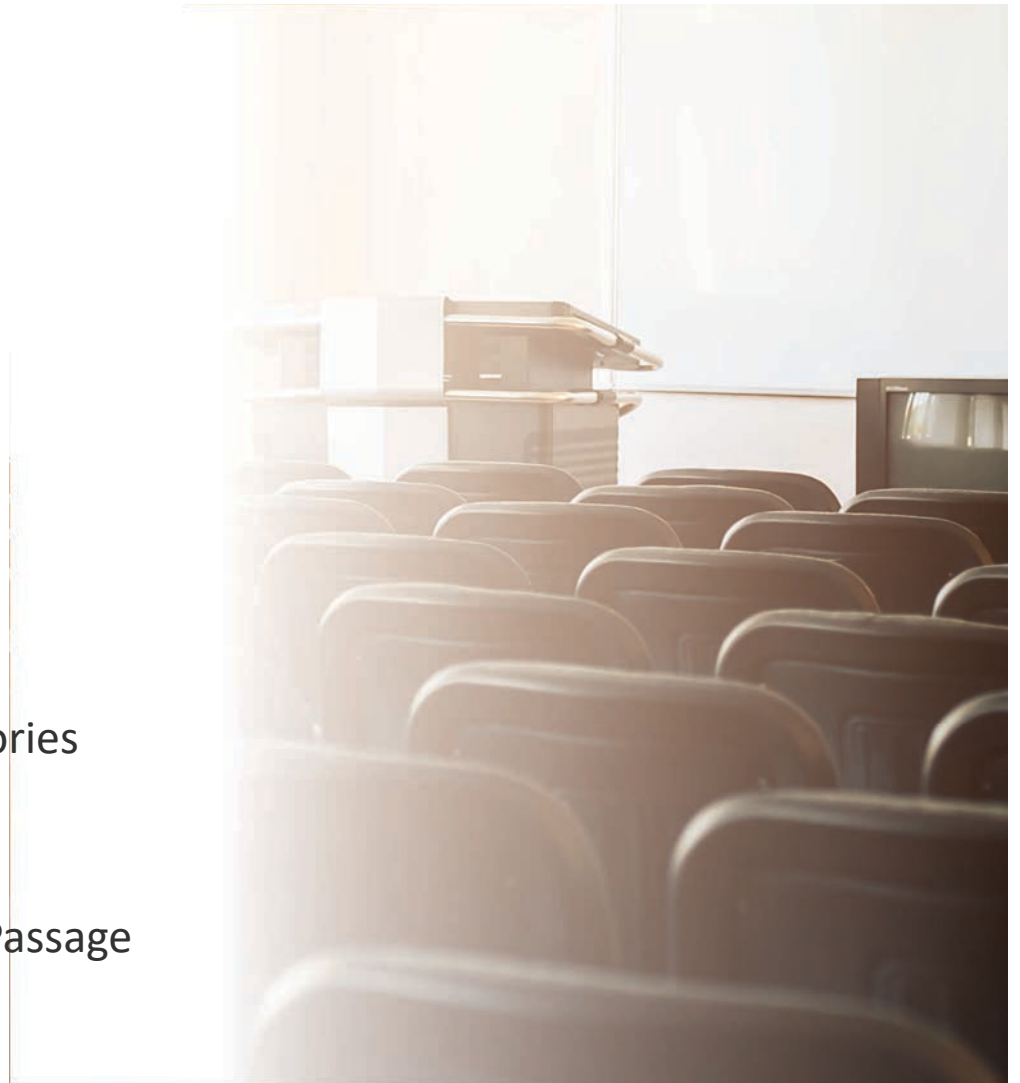
14 BTE Users

Paired Comparison

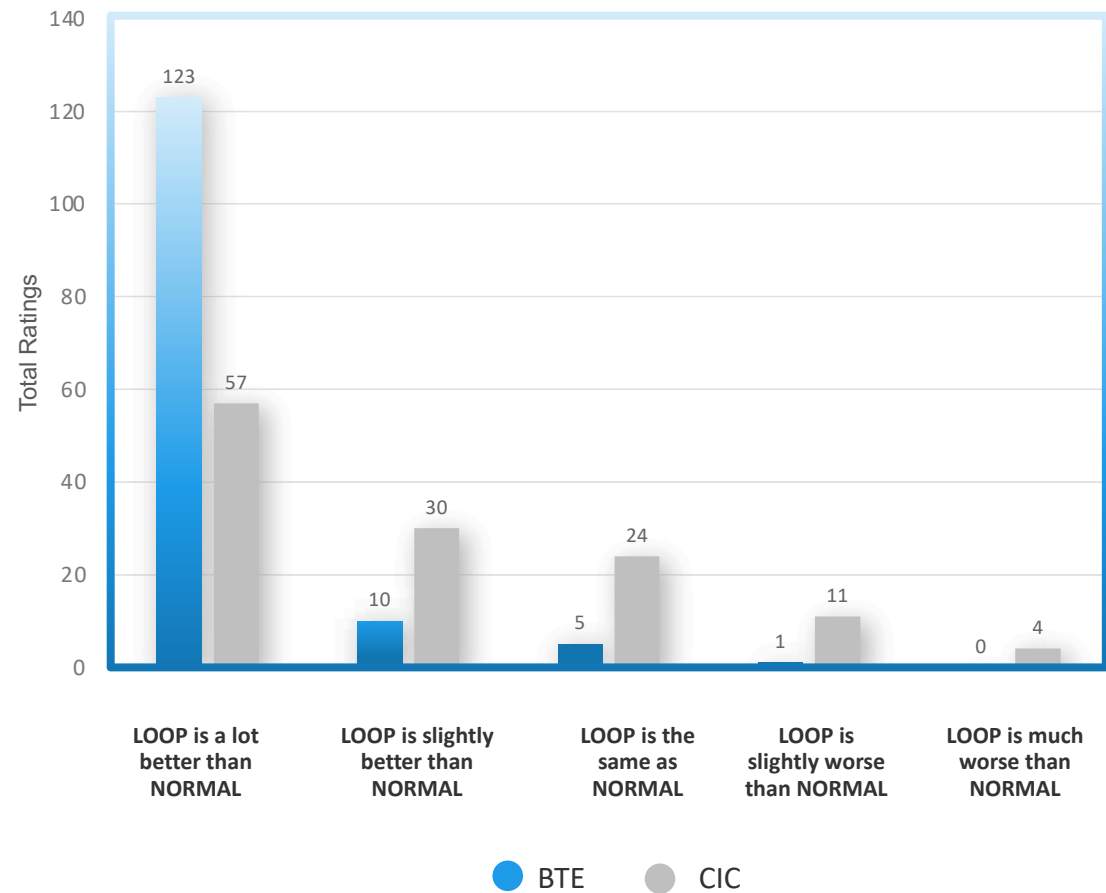
“Normal” microphone vs. “Loop” memories

Test Material

Movie dialogue from Jersey Boys
live-speech recital of The Grandfather Passage

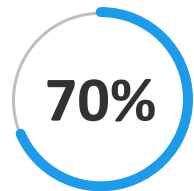


Preference for Telecoil over microphone in auditorium environment



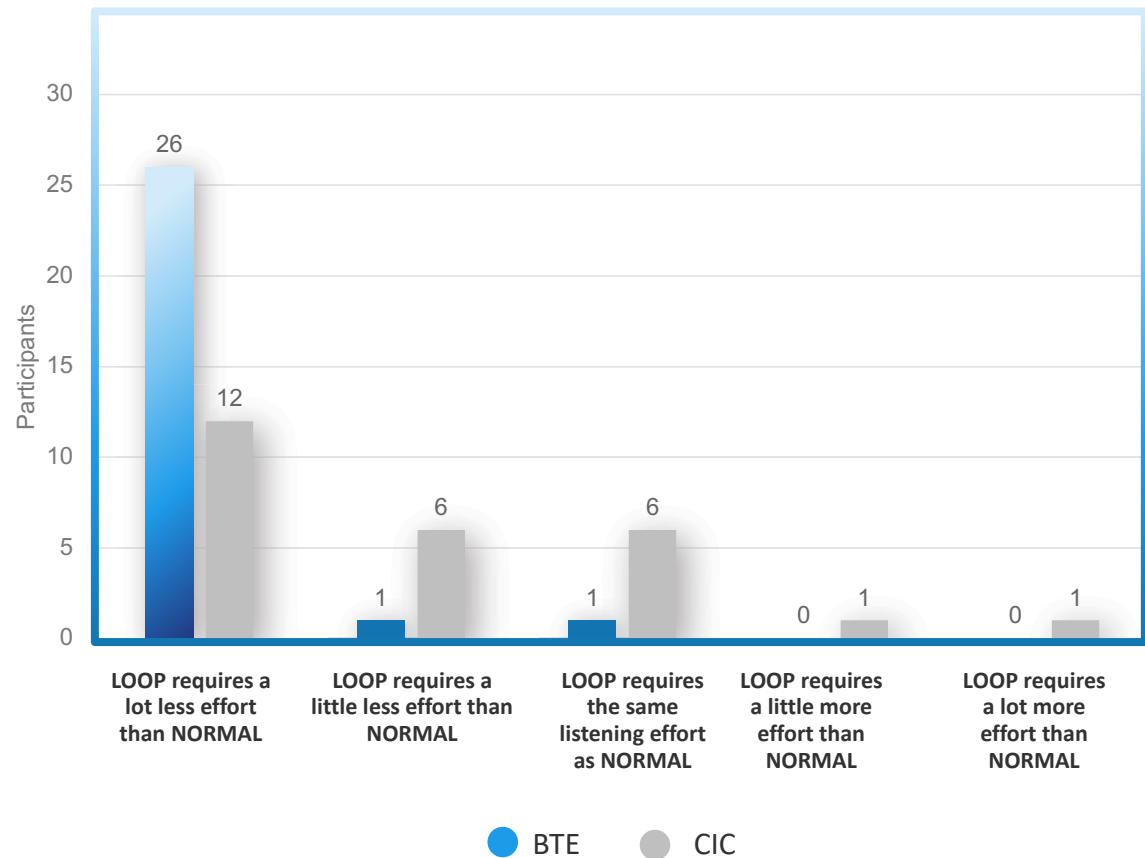


of BTE users
experienced less
effort with telecoil
than without



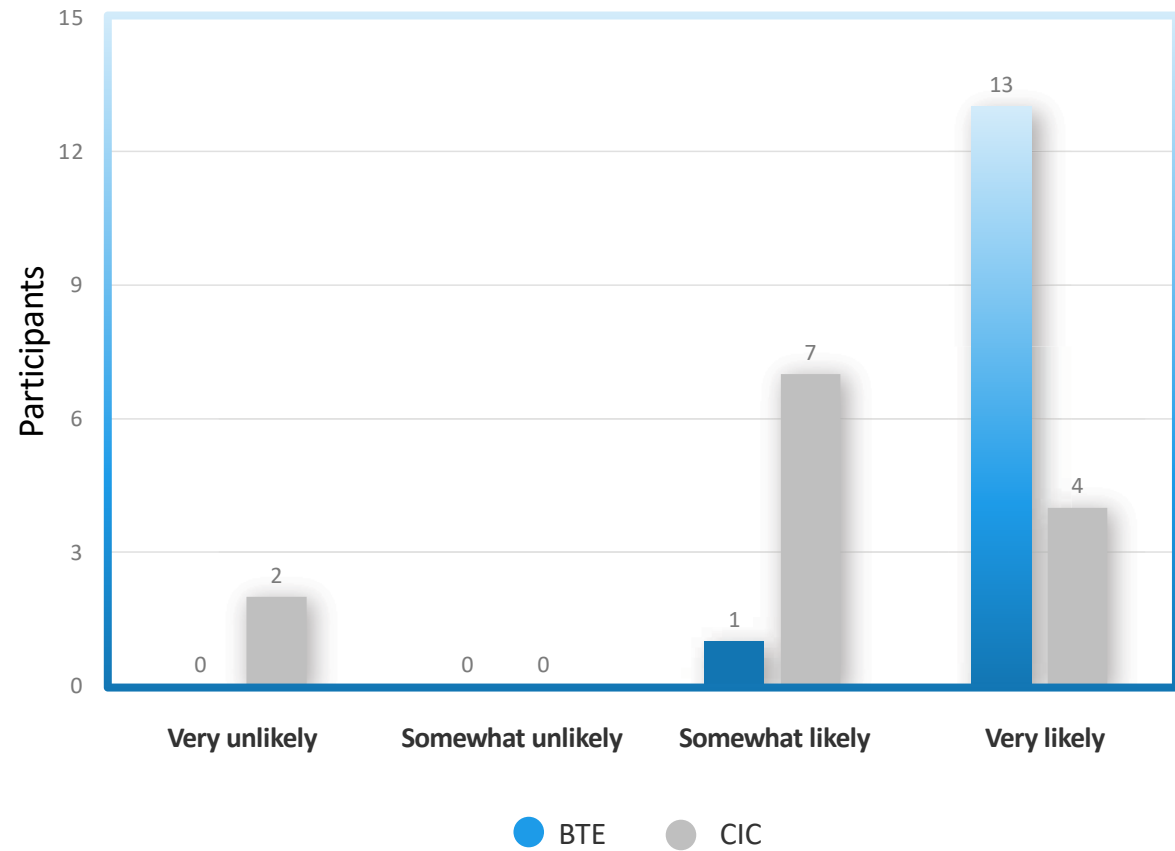
of CIC users
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effort with telecoil
than without

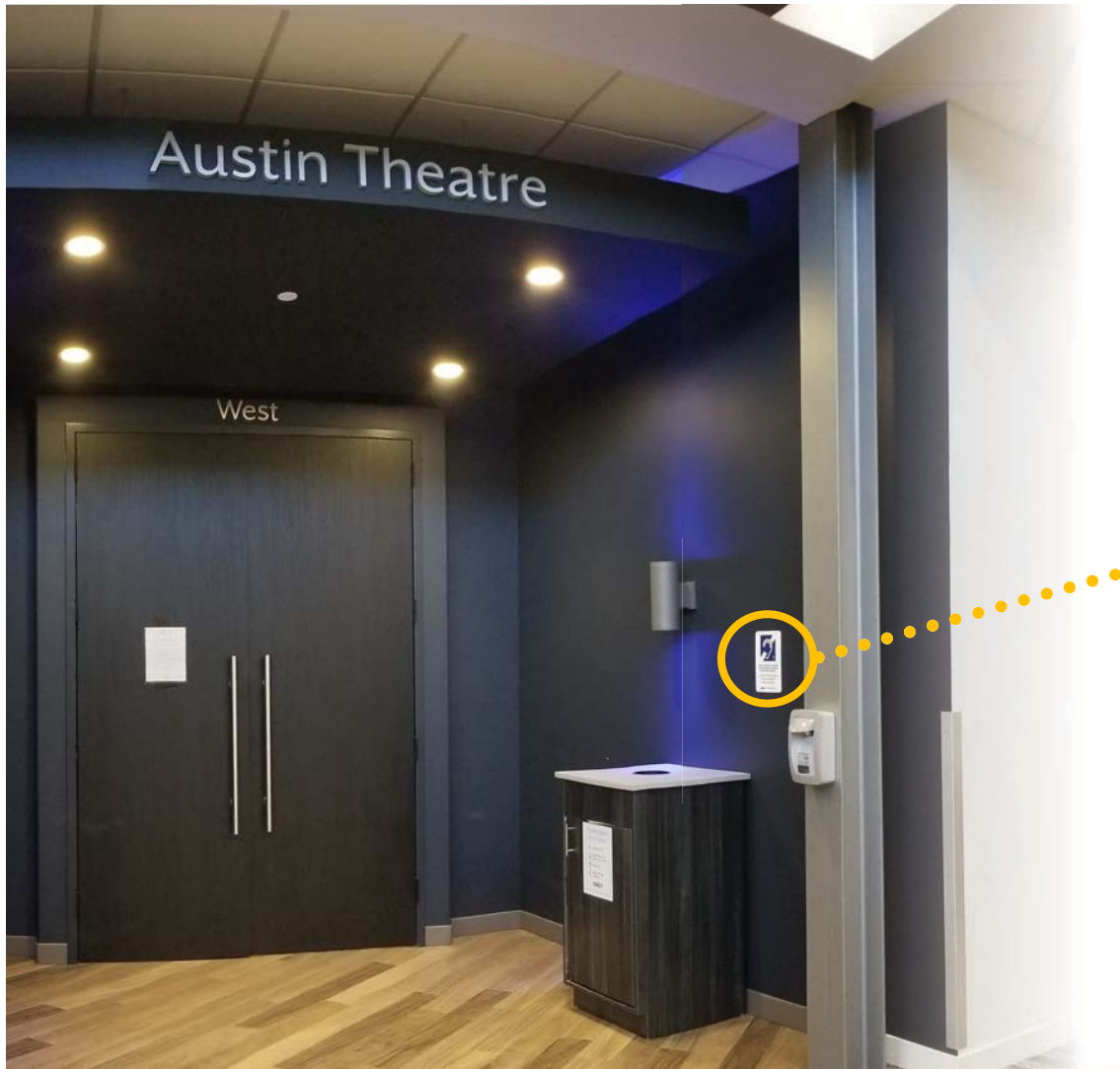
Effect of Listening Mode on Perceived Listening Effort



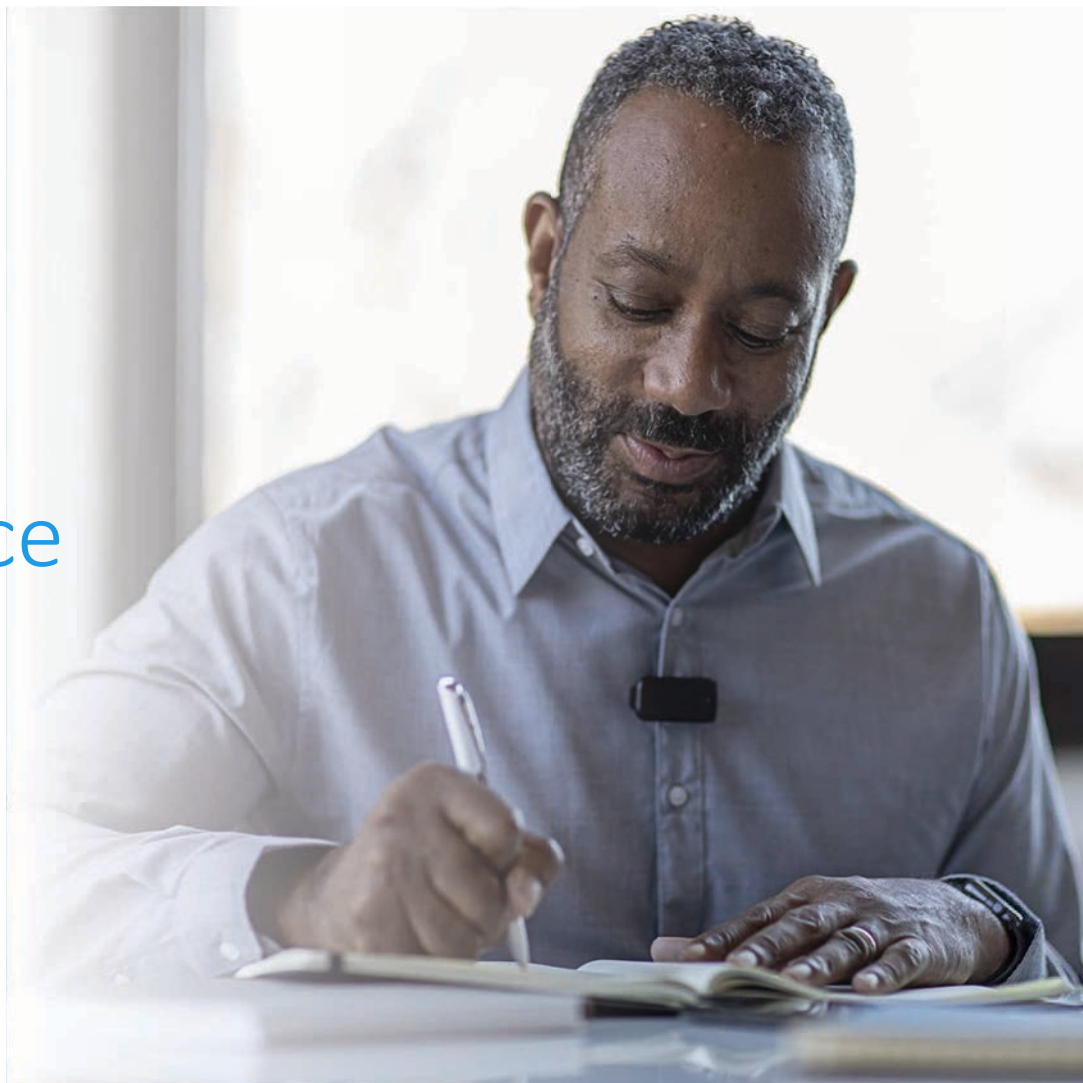
Likelihood of using a telecoil or “Loop” mode in the future

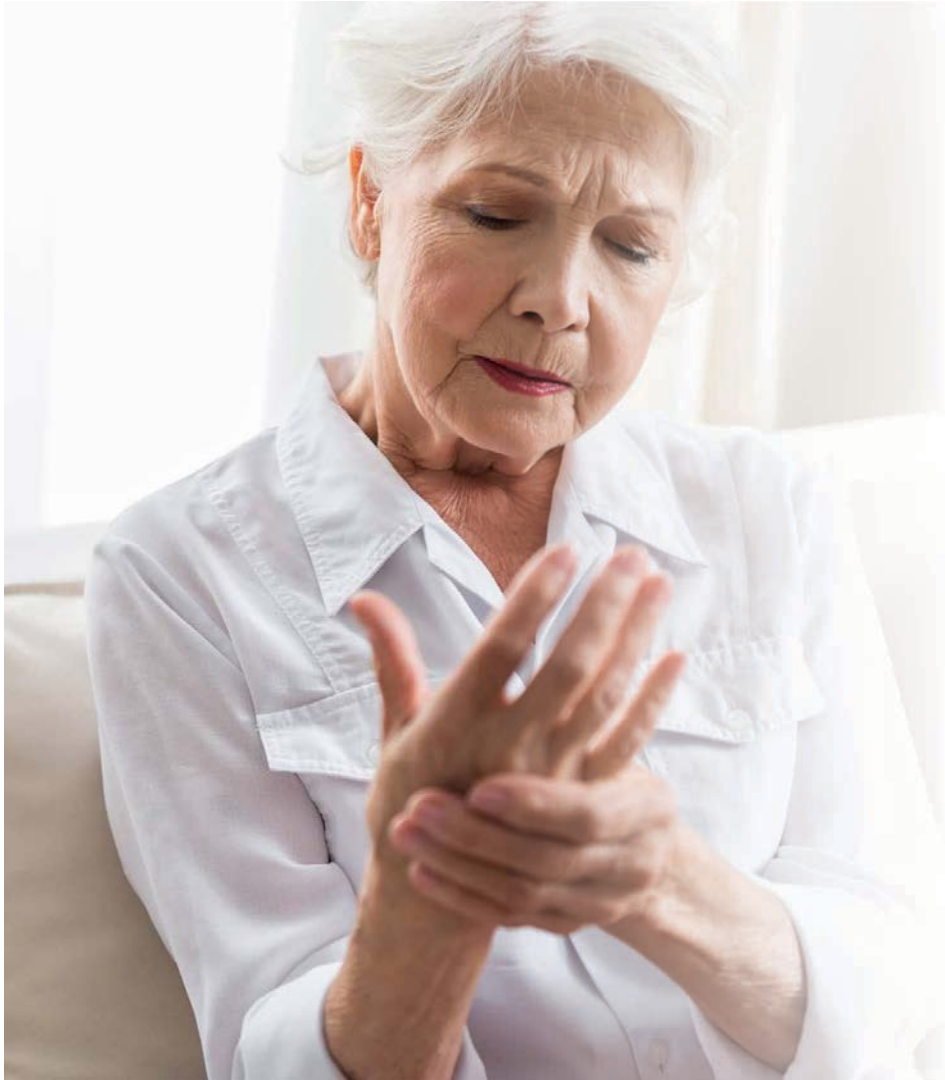
Most wanted to
continue using the Loop





Optimize the
Hearing Experience
with Accessories





By 2040,
~34.6 million adults
will report **arthritis-attributable**
activity limitations.

Source: Centers for Disease Control and Prevention

Inhibit successful hearing aid use:

Visual acuity

Manual dexterity

Fingertip sensation

Cognitive ability

Source: www.hearsogood.com; *Success with Hearing Aids: Vision and Dexterity*

Older listeners need a **3 dB more** favorable **signal-to-noise ratio** than younger adults on **speech in noise tests**

Pichora-Fuller: Using the brain when the ears are challenged helps older listeners compensate and preserve communication function. 2009



Challenging Situations, Simple Solutions

"My fingers are numb,
I need an **easy way to**
adjust my hearing aids."

"I have a hard time
understanding co-workers
at my business meetings."

"My hearing **keeps me**
from enjoying tv with
my grandchildren."

"I'd like to hear my spouse
better when we're in the
car, **without taking my eyes**
off the road!"

"How can we
communicate more
easily with my hearing-
impaired parent?"

"How can I adjust my
hearing aids during a
meeting **without looking**
like I'm on my phone?"

How do Accessories Communicate with Hearing Aids?

Wireless Transmission

Starkey Proprietary 2.4 GHz Protocol

Utilized for connection to
Starkey 2.4 GHz accessories



2.4 GHz and Streaming

What is Streaming?

Receiving audio from an electronic source



Phone calls



Media
music, podcasts, etc.



Accessories

Apple and Android have proprietary streaming protocols for their systems





Star**Link**

Everything is Better
When You Accessorize

Connect to favorite music, TV shows, and
phone calls with superior sound quality



Overcoming Obstacles

Understanding speech in the presence of background noise is often the highest hurdle our patients face

Remote microphones have been shown to provide significant benefit for speech understanding, in quiet or noisy environments*

**The Benefit of Remote Microphones using Four Wireless Protocols. Rodemerk and Galster, 2015*

Speech in Noise Testing

**We should measure the most common
complaint of patients with hearing loss**

Easy, fast and reliable

Predict hearing aid use

Technology choices

Assess hearing aid benefit

Compliance with best practice guidelines

**Performance in noise can't be reliably predicted from the pure tone
audiogram or other standard audiometric tests**

Speech-in-Noise TESTS

Hearing in Noise Test (HINT)

Nilsson, Soli, and Sullivan, 1994

Words in Noise (WIN)

Wilson, 2003; Wilson and Burks, 2005

Connected Speech Test (CST)

Cox, Alexander, and Gilmore, 1987

QUICKSIN

Etymotic Research, 2001

Killion et al., 2004

Speech Perception in Noise Test (SPIN)

Kalikow, Stevens, and Elliott, 1977

Bamford-kowal-bench Sin (BKB-SIN)

Etymotic Research, 2005

Bench, Kowal, and Bamford, 1979

Niquette et al., 2003

Acceptable Noise Level (ANL)

Nabelek et al., 2006

Acceptable Noise Level Test



Frye Electronics, Inc.

Measures tolerance for background noise

Hearing aid use

Predicts acceptance of amplification

3 minutes

(503) 549-4399 or sales@frye.com

ANL Clinical Application

Low ANL

NOISE TOLERANT

Nabelek et al. (2006)

Willing to listen at poor SNRs
Directional and remote microphones

Likely to be a successful hearing aid wearer

Focus on intelligibility of speech

High ANL

NOISE INTOLERANT

Recker et al. (2011)

Only willing to listen at high SNRs
Directional and remote microphones

Likely to be an unsuccessful hearing aid wearer
Noise reduction technology

Counseling

Focus on listening effort or loudness

QuickSIN

**Quickly quantify ability to hear
in noise**

Unaided vs. aided

Old vs. new technology

Omnidirectional vs. directional
microphones

Benefit of a remote microphone

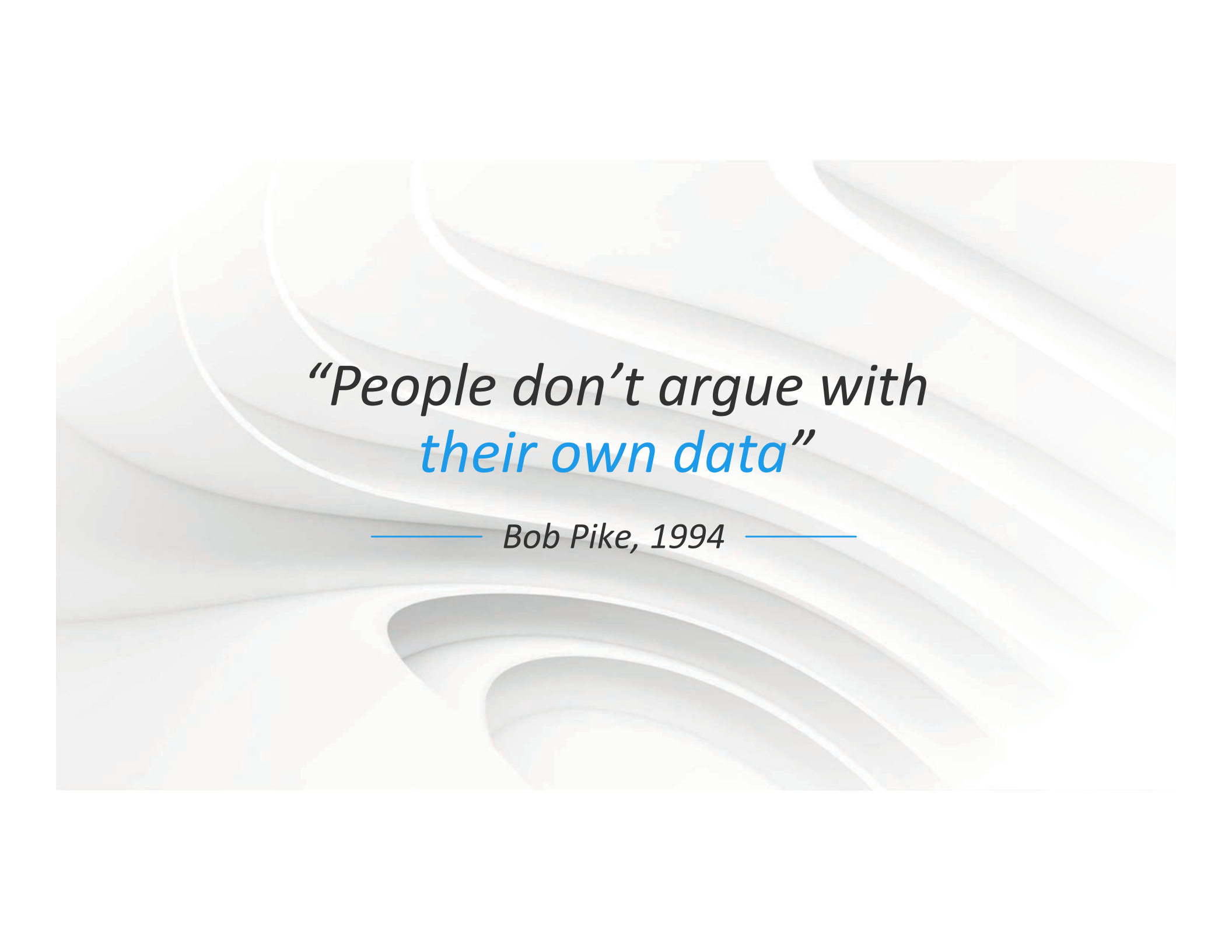
5 minutes



ETYMOTIC

Using Quick Sin Scores to Guide Technology Selection

SNR Loss	Improvement With Directional Microphone
0 - 3 dB	May hear better than someone with normal hearing
3 – 7 dB	May hear almost as well as someone with normal hearing
7 – 15 dB	Directional microphone helps
> 15 dB	Maximum SNR improvement is needed – consider remote microphone or FM system



*“People don’t argue with
their own data”*

——— *Bob Pike, 1994* ———

Remote Microphones

Optimal Use Cases

Attach to a speaker's clothing in a quiet or noisy environment

Place on a surface such as a table in a challenging environment

Place close to a desired audio source such as a TV speaker to create a portable tv streamer



"I can't hear my wife
when we go out to eat"



"I have trouble hearing
my professor in class"



Mini Remote Microphone

Streams remote microphone
audio directly to Starkey 2.4GHz
hearing aids



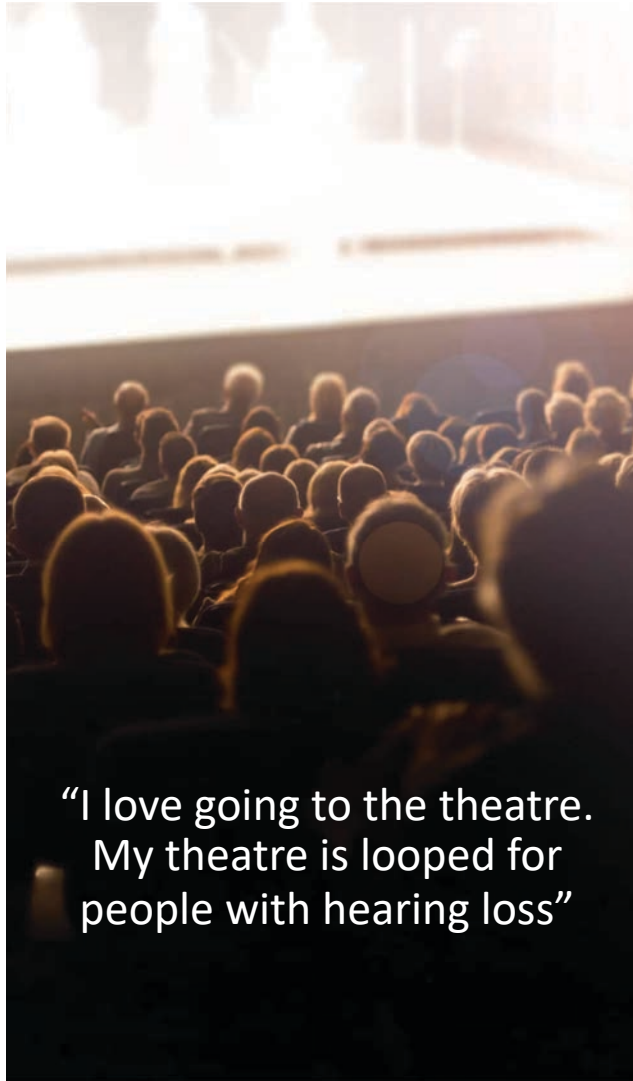
Mini Remote Microphone

Optimal Use Cases

Assistive listening device when worn by a speaker during one-on-one interactions in a quiet or noisy environment

Attach to a companion's clothing or place close to a desired audio source such as a TV speaker to create a portable tv streamer

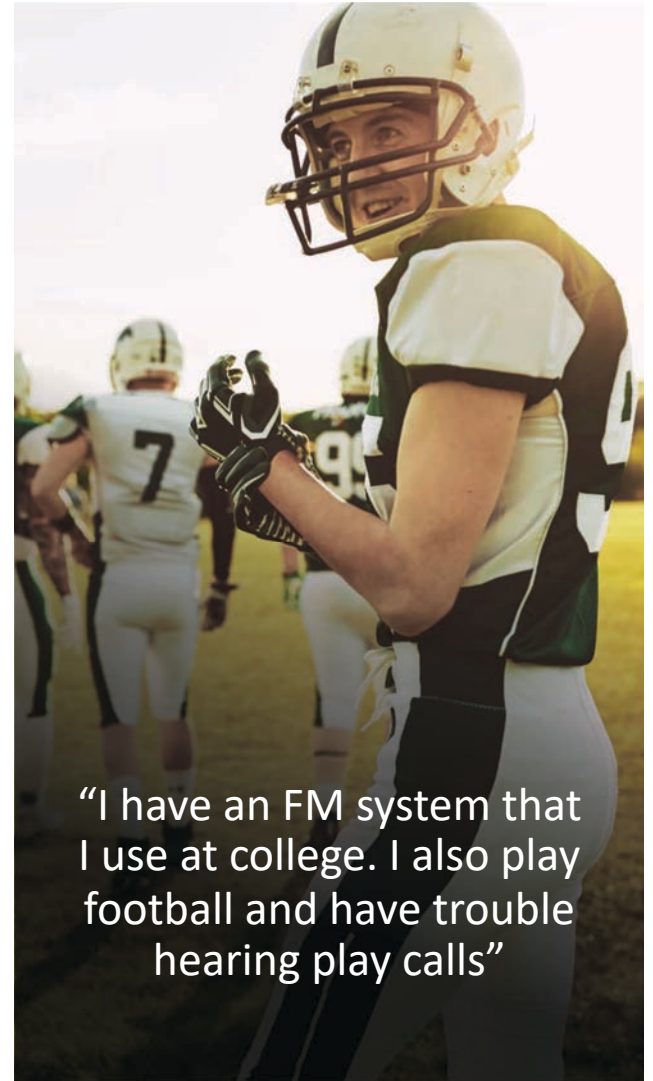




"I love going to the theatre.
My theatre is looped for
people with hearing loss"



"I spend a lot of time on my
computer. I am a professional
gamer and need to hear my
team when I play"



"I have an FM system that
I use at college. I also play
football and have trouble
hearing play calls"

Remote Microphone +

The accessory that does it all
your patient needs





Key Features

First 2.4 GHz accessory on the market
with 5 audio inputs: *Remote Microphone*,
Bluetooth, *Teleloop*, *FM system* and *Line-In*

Ease of use

Onboard streaming volume adjustability

Integrated easy grip clip, dampens case noise
when placed on a surface

Automatic microphone directionality for
voice pickup

Streaming time: up to 10 hours

Approximately 3 hours to charge
(depending on initial state of battery)

Remote Microphone +

Optimal Use Cases

Stream from phones that do not offer
direct streaming to the hearing aids
(*i.e. flip phones*)

Companion microphone



Remote Microphone +

Secondary Use Cases

Stream music or other audio from
Android devices

Loop system connectivity via
induction coil

Analog line-in via micro USB

FM system via Europin jack and
third party FM receiver



"I have trouble hearing
at family gatherings"



"I spend a lot of time in
business meetings with my
team. I am a consultant "



Table Microphone

Eight directional microphones and **beam-forming** technology enhances listening in challenging environments



Table Microphone

Optimal Use Cases

Determine and follow primary speakers in quiet or noisy backgrounds

Focus on 2 speakers via a tap to particular segments

Listen to multiple speakers in a quiet environment



Table Microphone

Secondary Use Cases

Companion Microphone

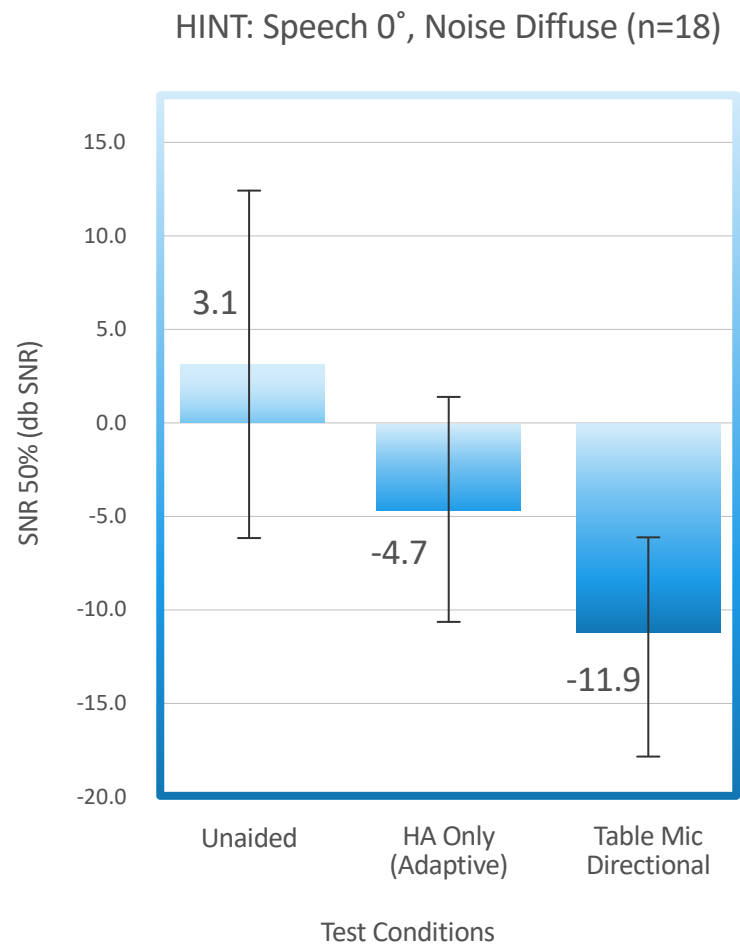
Stream audio from any device that uses a 3.5 mm audio out jack

Benefit for non-hearing aid wearers and normal hearing individuals who desire more effortless listening in quiet or noise



Proven Benefit

Eight directional microphones provide increased speech understanding in noise — beyond what is possible with hearing aids alone



Patient Benefit

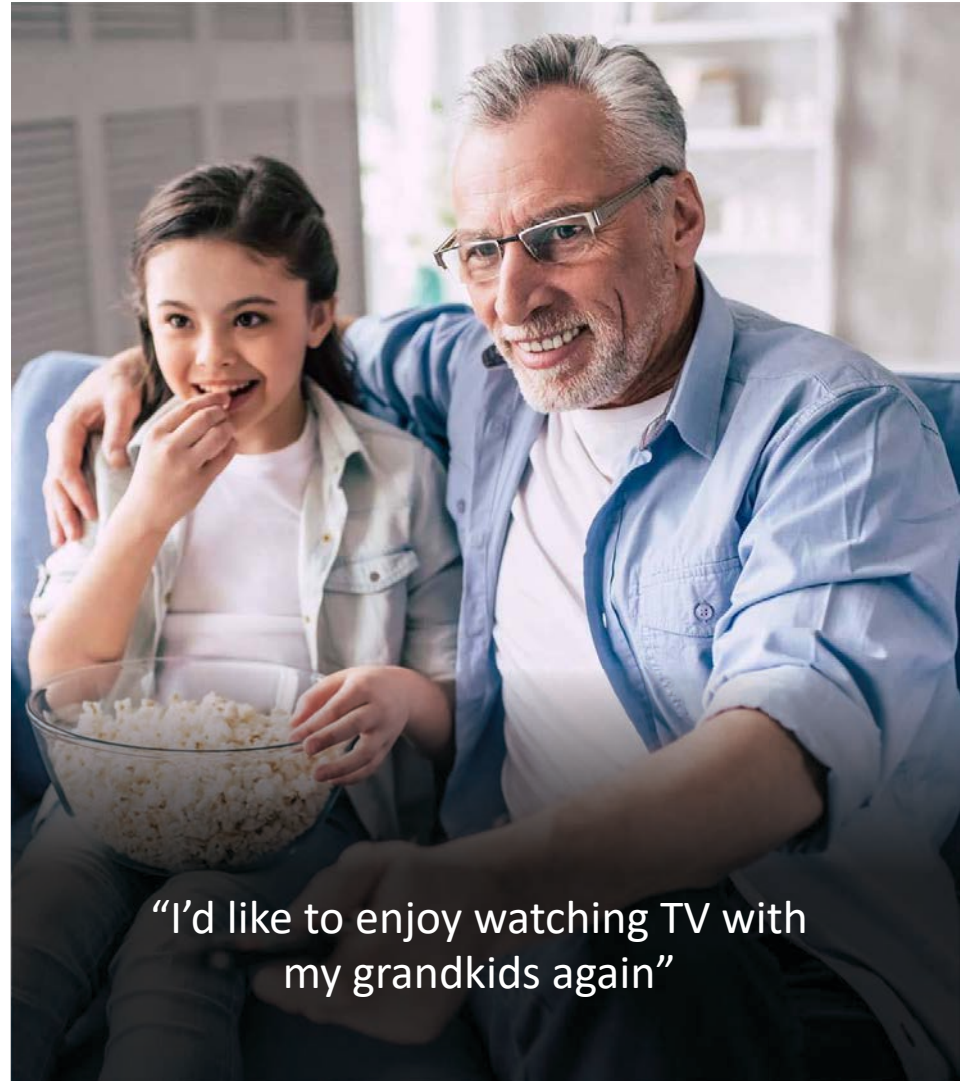
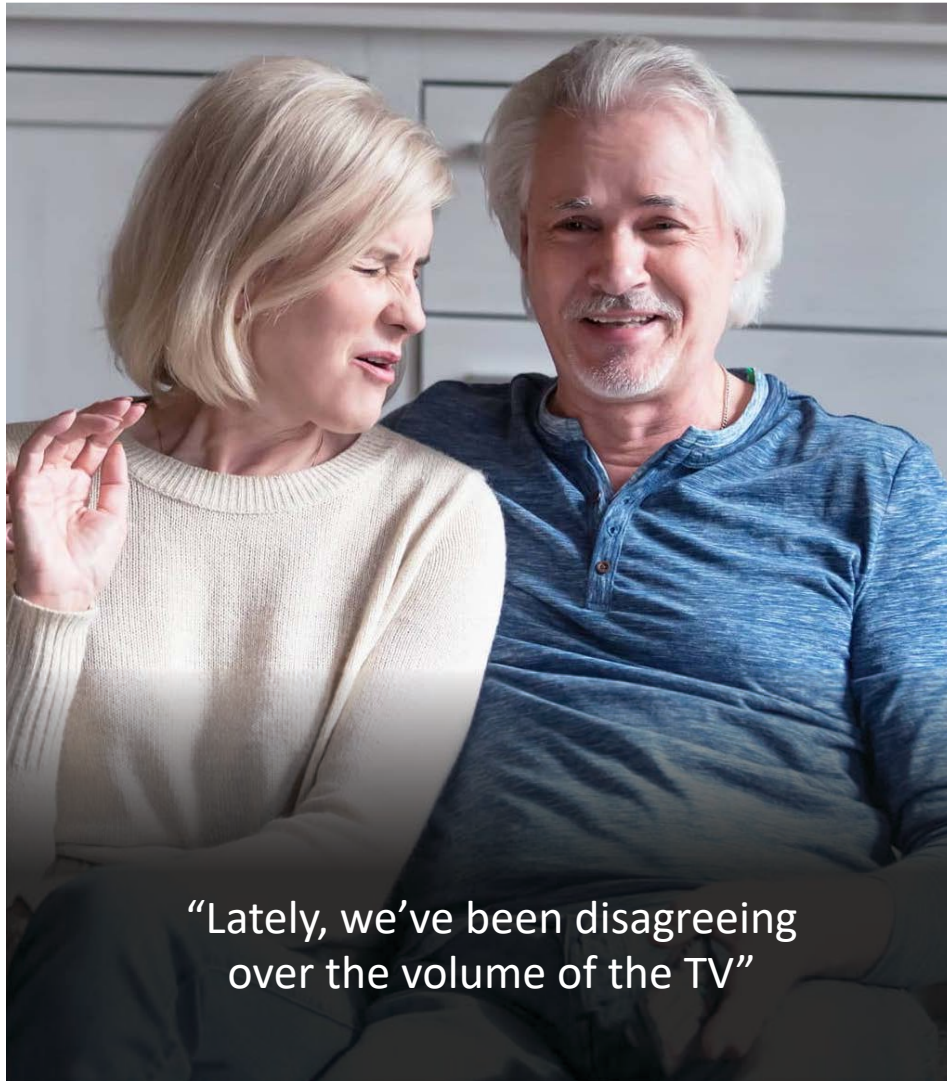
Remote Microphones

Feature Benefits Why patients Will Want It

Provide significant benefit for hearing-impaired patients to hear more of speech understanding conversation using less effort

Can be worn by the listener and a speaker even at a distance of interest

Reduces distraction and allows to understand and participate in competing background conversations in noisy situations speech or noise



TV Streamer

2.4 GHz Television streamer

Stream audio from TV, computers, MP3 players, cable boxes and more

Compatible with unlimited number of Starkey 2.4GHz hearing aids

Automatically converts Dolby 5.1 audio input to stereo output

Operating range of up to 45 feet



Patient Benefit TV Streamer

Feature Benefits Why Patients Will Want It

Wireless connection to hearing aids	Can directly stream TV viewing with loved ones at a volume that's comfortable for everyone
Unlimited wearers can stream from each TV streamer device	Can use a separate streamers for each TV in their home
Multiple streamers can be used in the home environment	

“My dexterity is poor and I don’t have a smart phone, how can I easily adjust my hearing aids?”



“I’d like to adjust my hearing aids in a business meeting without looking like I’m playing on my cell phone”



Remote Control

2.4 GHz remote

No charging necessary

Programmable favorite button

- Stop/start streaming
- Edge Mode+
- Tinnitus on/off
- Jump to memory 4

Starkey 2.4GHz hearing aids are pairable with **1 remote**



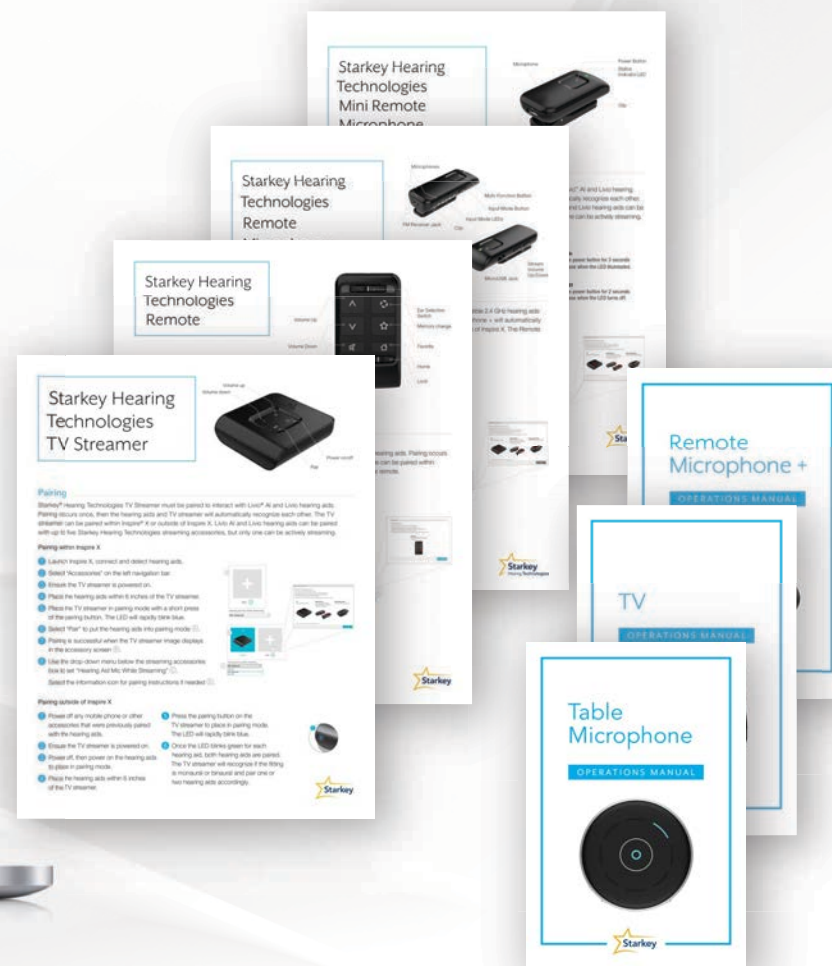
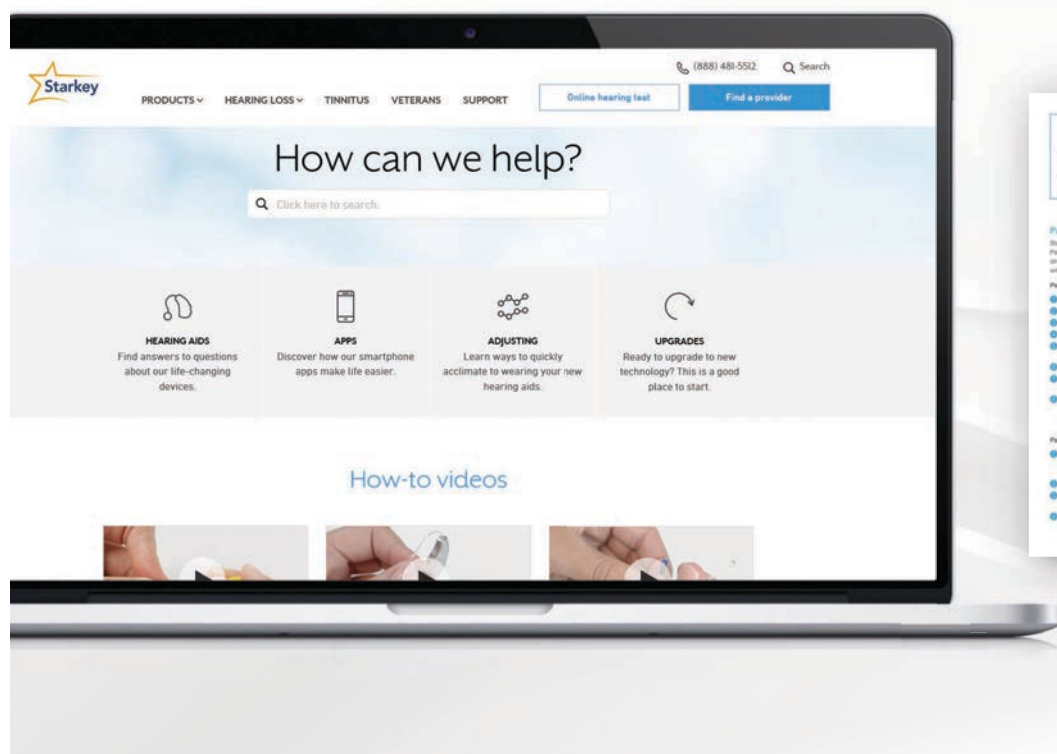
Patient Benefit

Remote Control

Feature Benefits	Why Patients Will Want It
Easy adjustments for hearing aid settings	Simple to use controls for volume and memory
No charging needed	No charging cables

Resources

Accessories





Accessories

Make identifying accessory needs part of your discovery

Uncover specific listening situations where accessories could improve hearing



Car



TV



Small groups

Target one accessory and demonstrate benefit



Alternatives
that Add Benefit

Voice AI

Genesis AI 24 exclusive

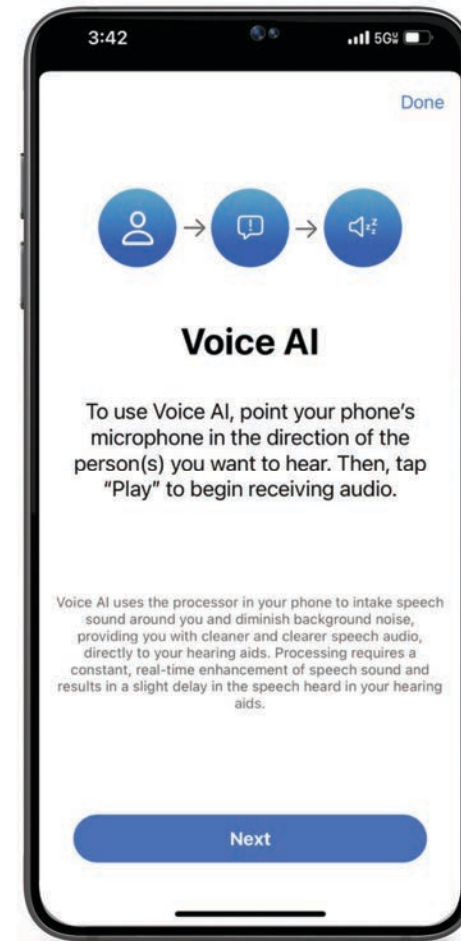
Users must have hearing thresholds of 50 dB or greater at 250 and 500 Hz for Voice AI to be available

Available for binaural fittings only

Exclusive for My Starkey Apple iOS users

Audio delay is presently too long for Android devices

Voice AI feature located in My Hearing menu when the above criteria has been met



Voice AI

Position the iPhone base toward the desired sound source

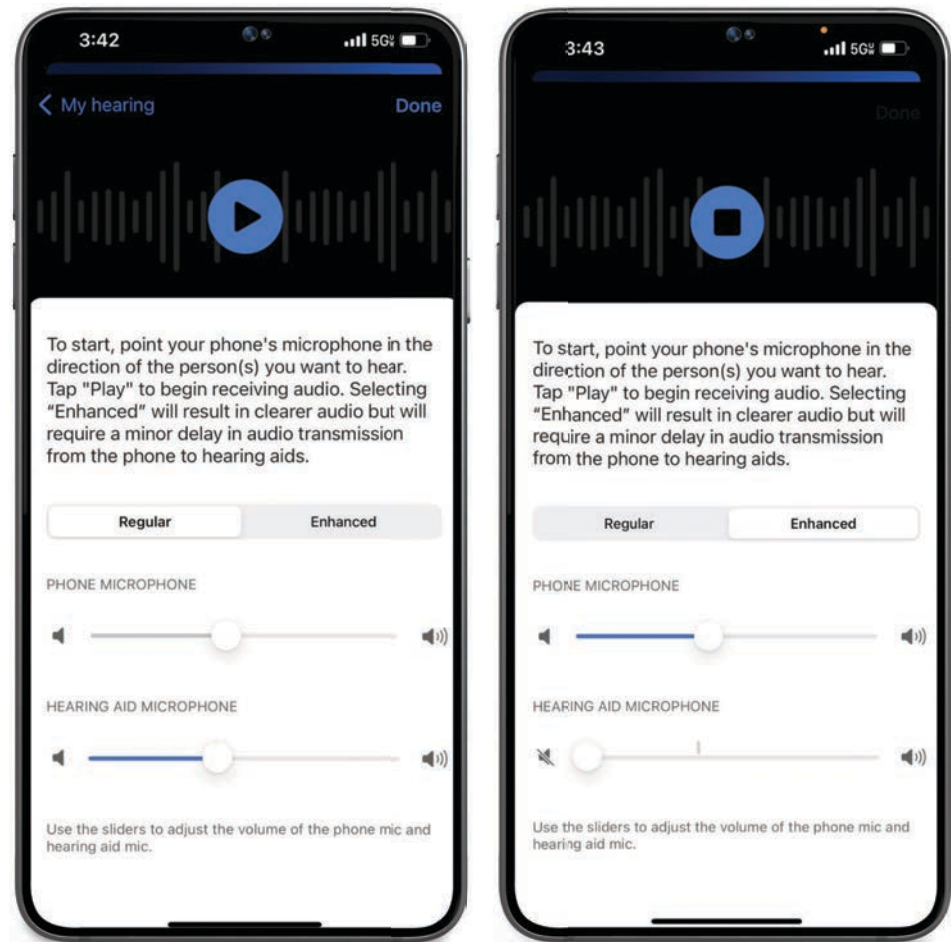
Tap the **Play** button to begin streaming from the phone microphone - “Play” button will become a “Stop” button

Select **Regular** or **Enhanced**

Regular: similar to Live Listen function but without the low pass filter imposed by iOS.

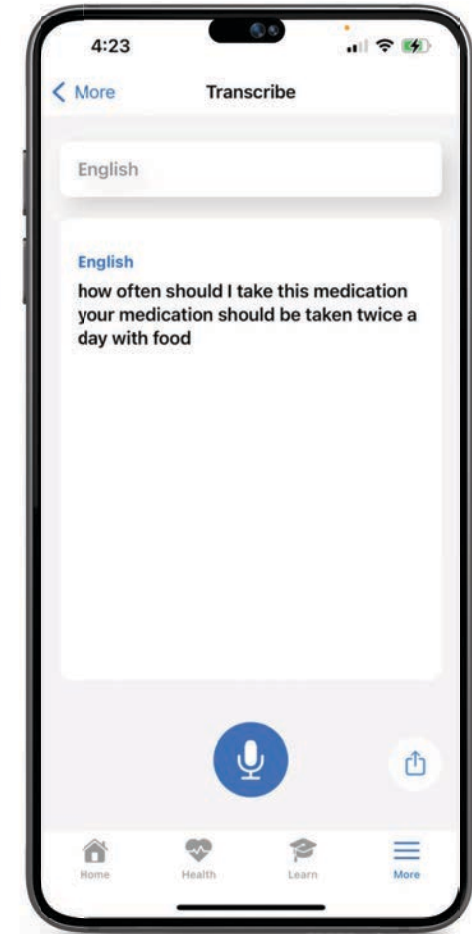
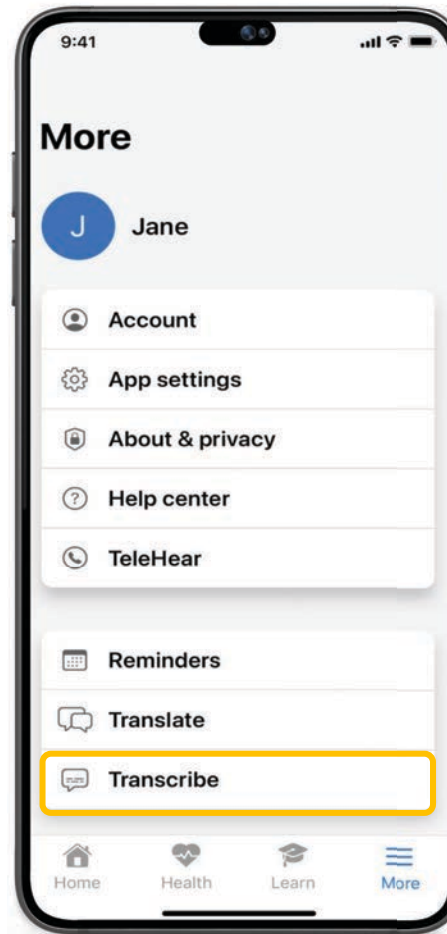
Enhanced: adds Voice AI algorithm

Adjust input of the Phone Microphone and Hearing Aid Microphones independently as desired



Transcribe

Tap **Transcribe** to display spoken word as text





Hearing Is Believing

The Importance of
Demonstrating Technology



Lab Benefit and the Effect of Demonstration on Patient Utilization

28 Individuals with Hearing Loss
(Experienced Hearing Aid Users)



**Evolv AI CIC & Remote
Microphone +
(with telecoil)**
14 Participants



Mild to Moderately-Severe Hearing Loss



**Evolv AI
PowerPlus BTE 13
(with onboard telecoil)**
14 Participants



Moderately-Severe to Severe Hearing Loss

Before the participants Left Their Fitting Session...

Participant groups

No demo group (n=7)

- Verbal counseling
- Shown the ADA accessibility signage

Demo group (n=7)

- Verbal counseling
- Shown the ADA accessibility signage
- Experienced a loop “demo” and practiced accessing the “Loop” program
- Given a list of local loops available to try on their own



Asked 1 Month Later...

All participants were asked

Do you recall talking about the telecoil?

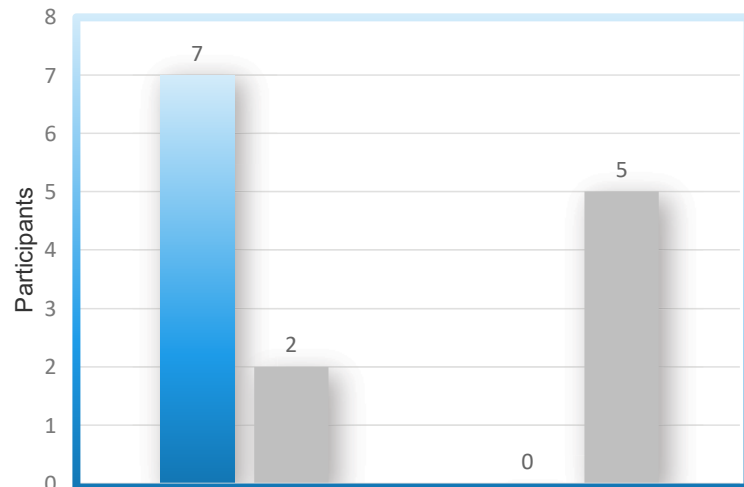
Do you recall what the "Loop" Program does?

Do you recall how to access the "Loop" Program?



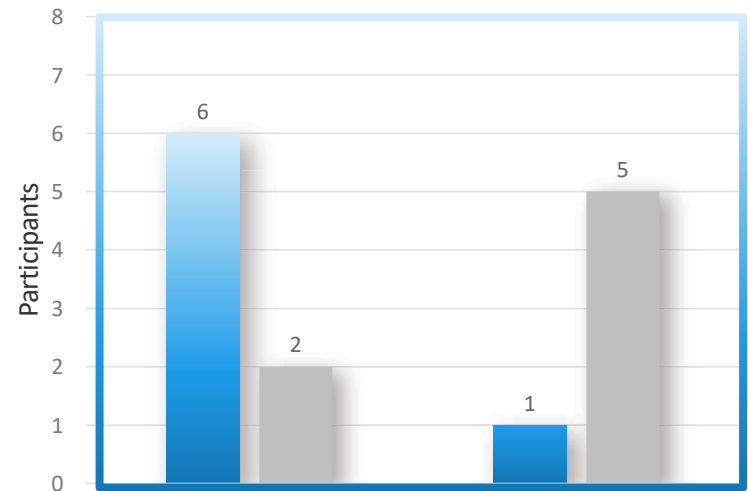
Demonstration Assists with Information Retention Regarding the “Loop”

Do you recall what the "Loop" Program does?



● Telecoil Demo (n=7) ● No Demo (n=7)

Do you recall how to access the "Loop" Program?

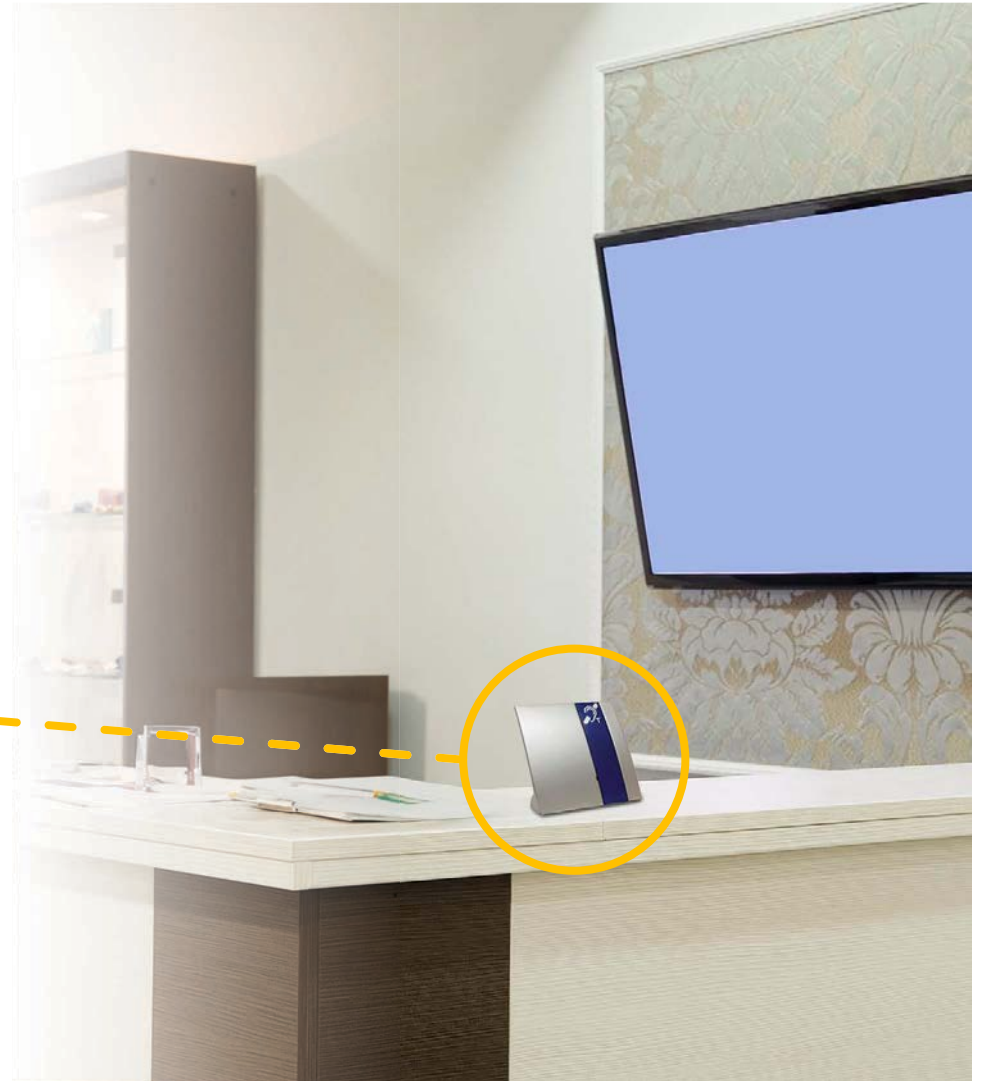


● Telecoil Demo (n=7) ● No Demo (n=7)

Demonstrating Loop Systems

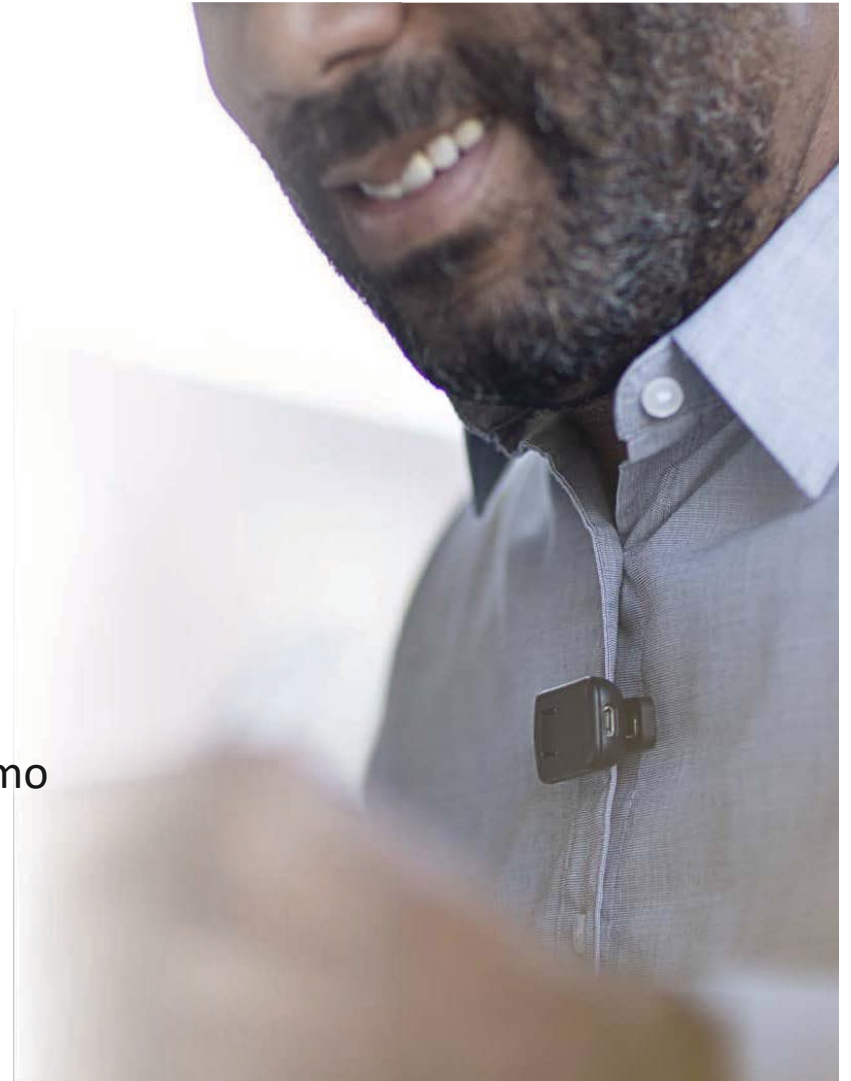


Hearing Counter Loop
Item Number: 900270



Demonstrating Accessories

- 1 Have your accessories ready
- 2 Wear the remote mic + or mini remote mic
- 3 Target the demo to patient's needs
- 4 Have the companion participate in the demo





Set Up for Success



Set Up for Success

KISS

Keep it simple

Focus FIRST on hearing performance

Introduce features over time

- introduce 1-3 most needed features
- provide homework for follow up visits

Set expectations

Practice

- See one, do one

Support system

- Who to contact for help



The Future of Assistive Technology



Assistive Technology in the Future

Auracast

Allows audio to be broadcast to unlimited number of compatible devices simultaneously, overcoming the one-to-one limitation of traditional Bluetooth

Transition to Auracast will take time

Eventually, Auracast will allow hearing aid wearers to connect seamlessly, wherever the technology is available



Assistive Listening Device Summary

Easy to use | Excellent sound quality

Simple functionality

Significant benefit for
challenging scenarios

Enhancing the
patient experience



Thank you



Hear better. Live better.