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Making a Connection

*Guiding Success with
Assistive Listening Devices*



Making a Connection: Guiding Success with Assistive Listening Devices

Keeley Layfield, Au.D.

Webinar FAQs

How to Ask a Question:

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

Where to get the handout:

- Resources in the classroom and under Pending Courses in your account

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- Click Live Transcript CC Button
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How to earn CEUs:

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

For assistance or tech support:

- Call 800-753-2160
- customerservice@audiologyonline.com
- Use the Q&A window

Risks/Benefits

- The applicability and accuracy of the course content may vary by the clinical, geographical, and cultural context, you should evaluate the course accordingly
- As healthcare is rapidly evolving, new findings may change the validity of the information presented in this course. Providers should always consult the latest research and guidelines from professional associations
- The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific, individual and population factors
- The course may not cover all possible risk factors, diagnostic methods, or treatment options, and complex cases may require additional considerations
- Healthcare providers should apply cultural competence and sensitivity to ensure effective and respectful care based on their patients' diverse needs
- Providers should always evaluate the limitations of diagnostic and screen tools, considering their potential for false results as well as any ethical implications
- It is the responsibility of course participants to critically evaluate the evidence from multiple sources to guide professional practice

Learner Outcomes

After this course, participants will be able to:

1

Describe how Assistive Listening Devices assists patients with hearing loss engage in their environments

2

Describe how to identify that a public environment is looped

3

Identify at least one key learning to implement in the clinic to improve patient outcomes



Realistic Goals for Amplification

“The primary goal of amplification for listeners with hearing loss is to restore audibility for speech and minimize the likelihood of loudness discomfort”

“Even when audibility can be achieved, listeners with severe-to-profound hearing loss are more likely to have significant suprathreshold deficits than listeners with lesser degrees of hearing loss”

Jorgensen LE, Benson EA, McCreery RW. Conventional Amplification for Children and Adults with Severe-to-Profound Hearing Loss. *Semin Hear.* 2018;39(4):364-376. doi:10.1055/s-0038-1670699.

Fitting Goals

- 1 Improve speech audibility while avoiding loudness discomfort
- 2 Provide acceptable speech quality
- 3 Preserve or enhance usable acoustic cues
- 4 Improve signal-to-noise ratio (SNR), ease of listening, and listening comfort in background noise
- 5 Support best possible communication via cell/mobile or landline telephones
- 6 Have convenient and reliable connections to hearing assistive technology
- 7 Limit maximum output to avoid discomfort/further hearing damage

Turton L, Souza P, Thibodeau L et al. Guidelines for Best Practice in the Audiological Management of Adults with Severe and Profound Hearing Loss. *Semin Hear*. 2020;41(03):141-246. doi:10.1055/s-0040-1714744.

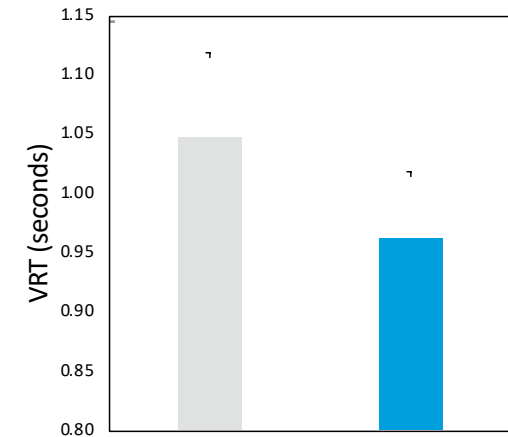
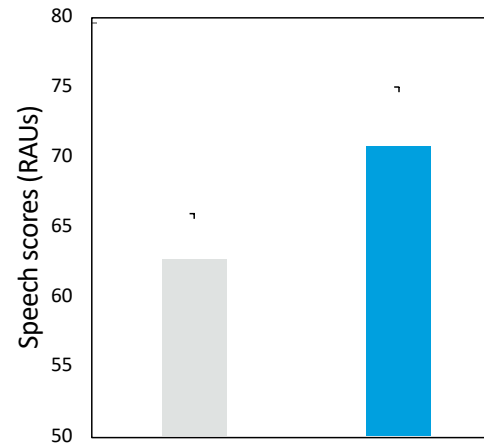
Broader Aided Benefit Goals

- 1 Audibility, avoiding discomfort and annoyance
- 2 Acceptable quality of speech
- 3 Improvement of WRS, preserve/enhance usable acoustic cues
- 4 Improvement in SNR and communicative ability and comfort in noise
- 5 Best possible telephone use
- 6 Maintain/improve music appreciation
- 7 Allow spatialization
- 8 Access to Hearing Assistive technology
- 9 Meeting expectations compared to other approaches
- 10 Reliability of device

British Academy of Audiology, British Society of Audiology. Definition of 'optimally aided' for experienced adult hearing users with severe-to-profound deafness.
British Academy of Audiology. 2019.

Edge Mode+ improves speech intelligibility and listening effort

Jaekel, B. and Xu, J. (2024)

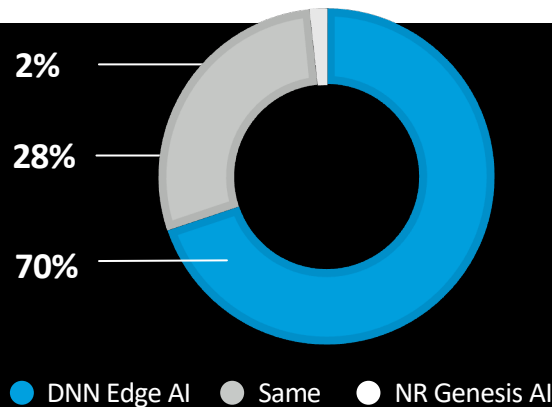


Default HA settings

Edge Mode+

Default HA settings

Edge Mode+



● DNN Edge AI ● Same ● NR Genesis AI



DNN Noise Reduction
preferred 3:1 over previous
technology when listening to
speech in noise

Betlehem, T. et al. (2024)



Treatment Options

Comprehensive Rehabilitation Treatment Plan

Alternate communication

Signing

Texting/ Written Communication

Alternative and Augmentative Communication

Hearing Aids

Hearing Aid Accessories

Streaming protocols

Cochlear Implants

Other implanted devices

Assessment

Diagnostic information

Non-auditory needs assessment

- Safety, alerting, pragmatic interactions in the world

Understanding the client's motivation, social and communication needs, and treatment goals through a detailed needs assessment

Developing a comprehensive treatment plan

Turton L, Souza P, Thibodeau L et al. Guidelines for Best Practice in the Audiological Management of Adults with Severe and Profound Hearing Loss. *Semin Hear*. 2020;41(03):141-246. doi:10.1055/s-0040-1714744.



Assistive Devices

Assistive listening devices (ALDs)

help amplify the signal of interest, especially when the user is in background noise; may be used with amplification

Alerting devices

emits a loud sound or blinking light to let someone with hearing loss know that an event is taking place

Augmentative and alternative communication (AAC) devices

help people communicate when a communication disorder is present

Assistive devices for people with hearing, voice, speech, or language disorders (2011) National Institute of Deafness and Other Communication Disorders.
Available at: [https://www.nidcd.nih.gov/health/assistive-devices-people-hearing-voice-speech-or-language-disorders#:~:text=Assistive%20listening%20devices%20\(ALDs\)%20help,an%20event%20is%20taking%20place](https://www.nidcd.nih.gov/health/assistive-devices-people-hearing-voice-speech-or-language-disorders#:~:text=Assistive%20listening%20devices%20(ALDs)%20help,an%20event%20is%20taking%20place).
(Accessed: 06 February 2025).



A close-up photograph of a person's ear with a telecoil device being adjusted by a hand. The person has light-colored hair, and the telecoil is a small, circular, metallic device attached to the ear. A hand with dark skin is visible, adjusting the device. The background is blurred.

Assistive Listening Devices

Telecoil and Looping Systems

Captioning Devices

Infrared Systems

FM Systems

Audio Streaming

Auracast Systems

Wireless Accessories

Telecoil

Also called an induction coil

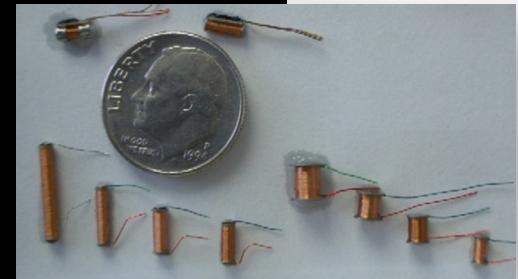
An additional piece of hardware that is added to the hearing aid

Works with phones (cell or land lines) that have an induction coil

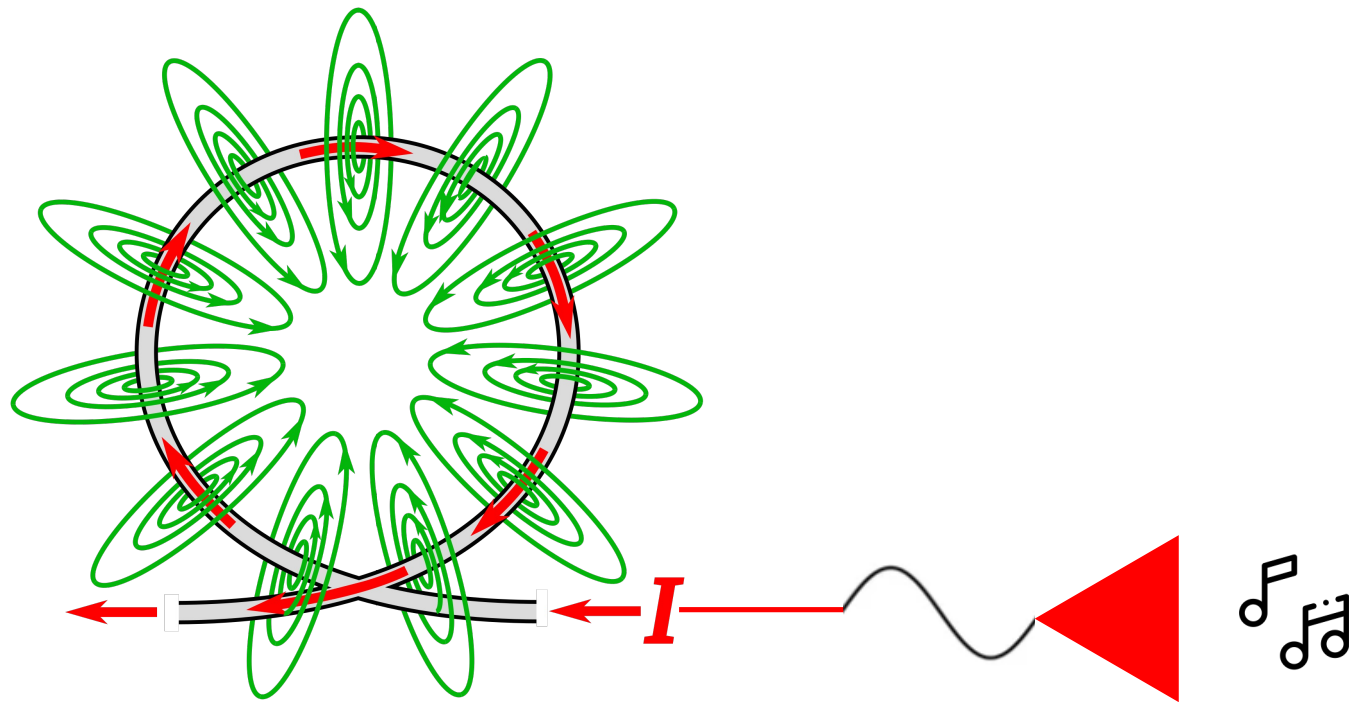
Works with “loop” systems in theaters, classrooms, etc.



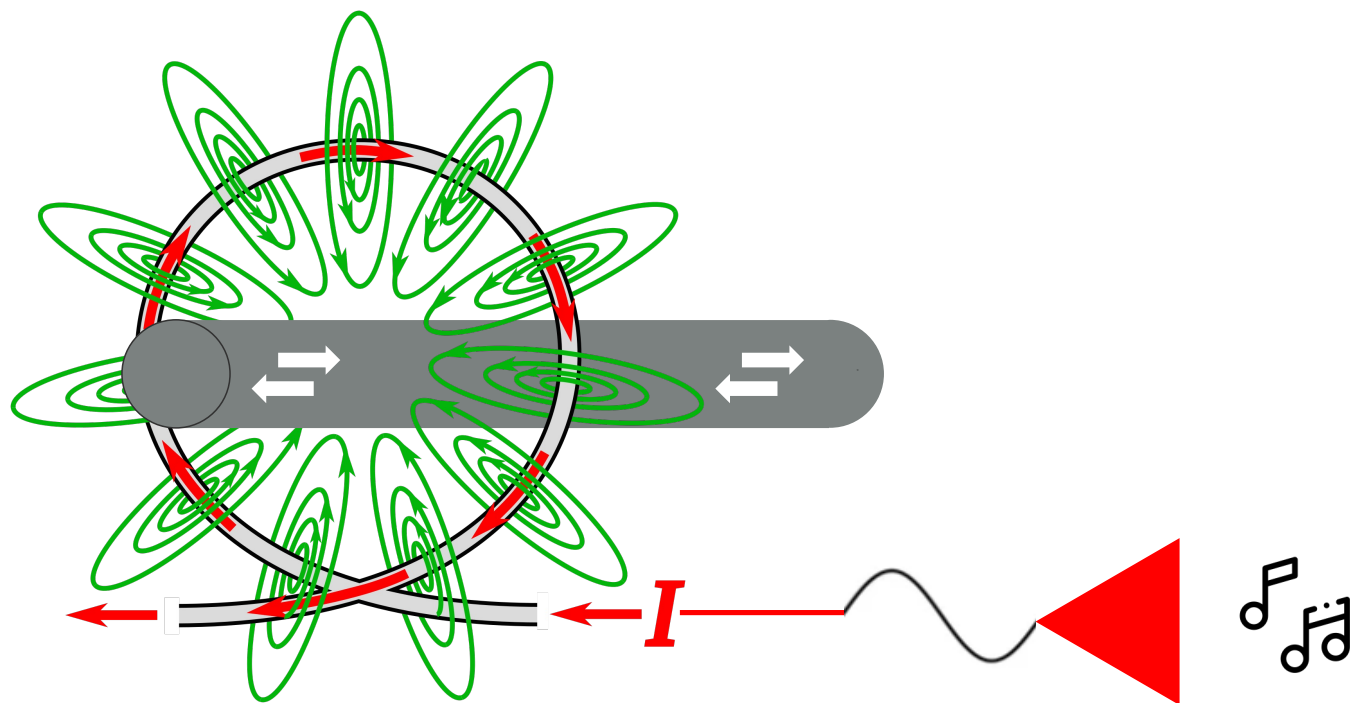
Symbol for a present
telecoil system



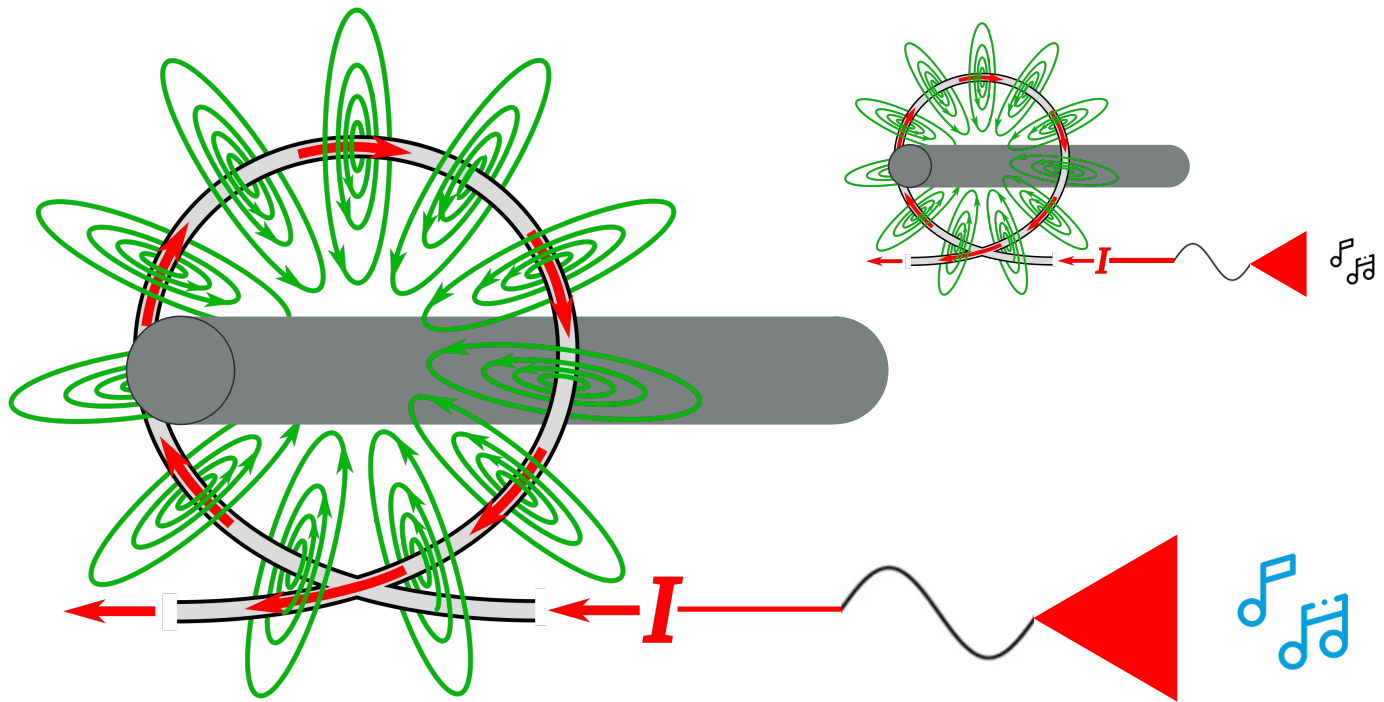
Telecoils



Telecoils

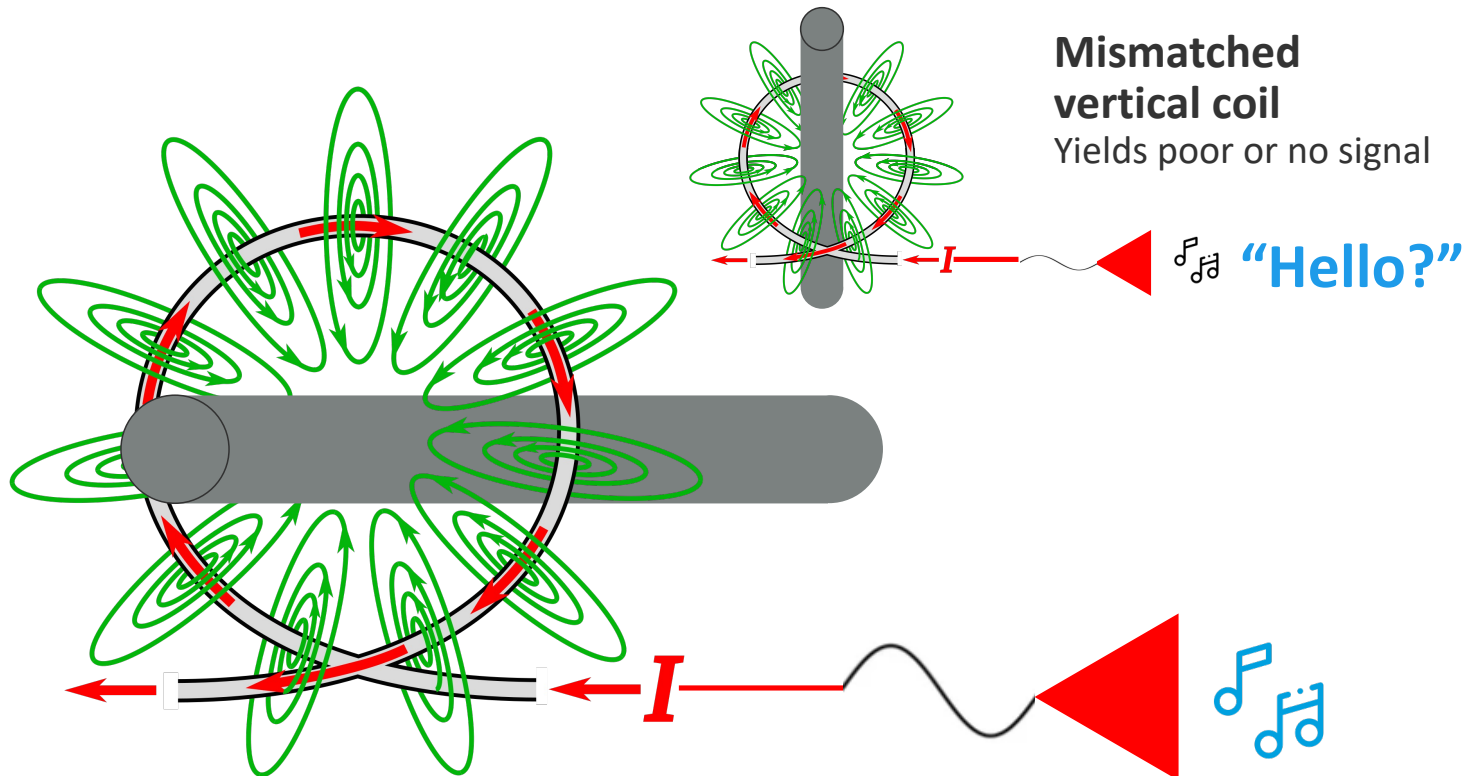


Telecoils



Telecoils

Horizontal coil
Needs similar
orientation
for coupling



Telecoils



Advantages

- Improved Signal-to-Noise Ratio
- Specific Hearing Aid Mic Configuration
- Easily Accessible
- No conversion needed
- Very basic and simple process



Disadvantages

- Subject to electromagnetic interference
- Need specific Hearing Aid Style
- Infrastructure is regional
- Hearing Aids and Landline Telephone require a specific orientation to maximize functionality

Telecoil Prevalence

Under the Americans with Disabilities Act (ADA) a hearing loop, infrared system, or an FM System is required

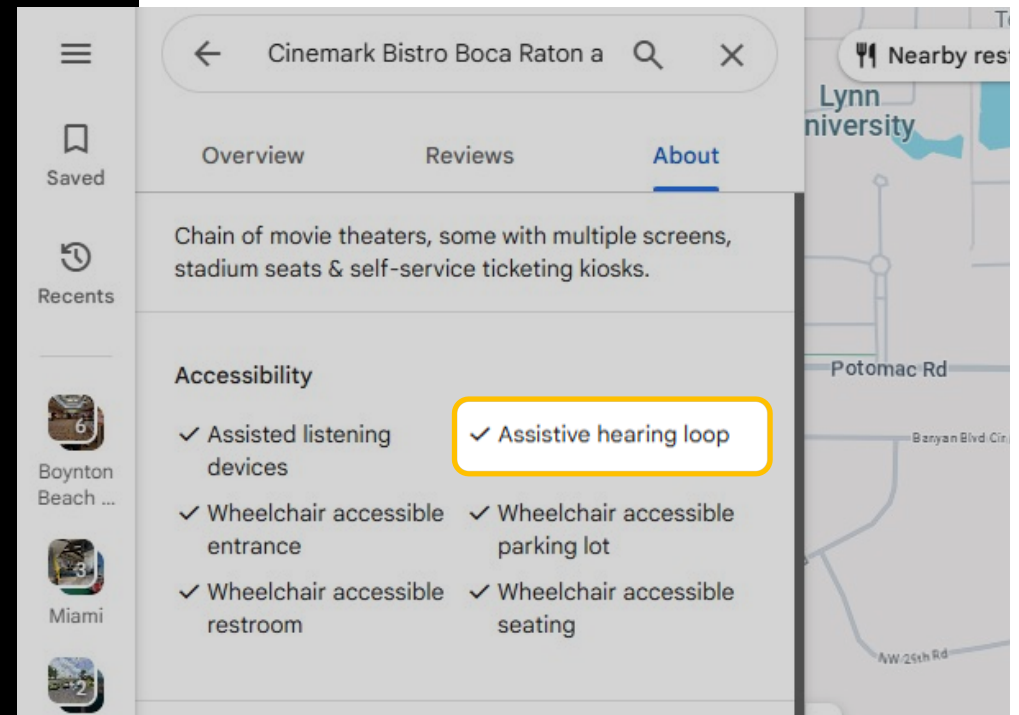
In ALL indoor/outdoor areas with a public address system

In ALL courtrooms

Where effective communication is needed

This includes but is not limited to:

Amphitheaters	Motion Picture Houses
Arenas	Theaters
Auditoriums	Performing Arts Centers
Lecture Halls	Concert Halls
Stadiums	Dinner Theatres



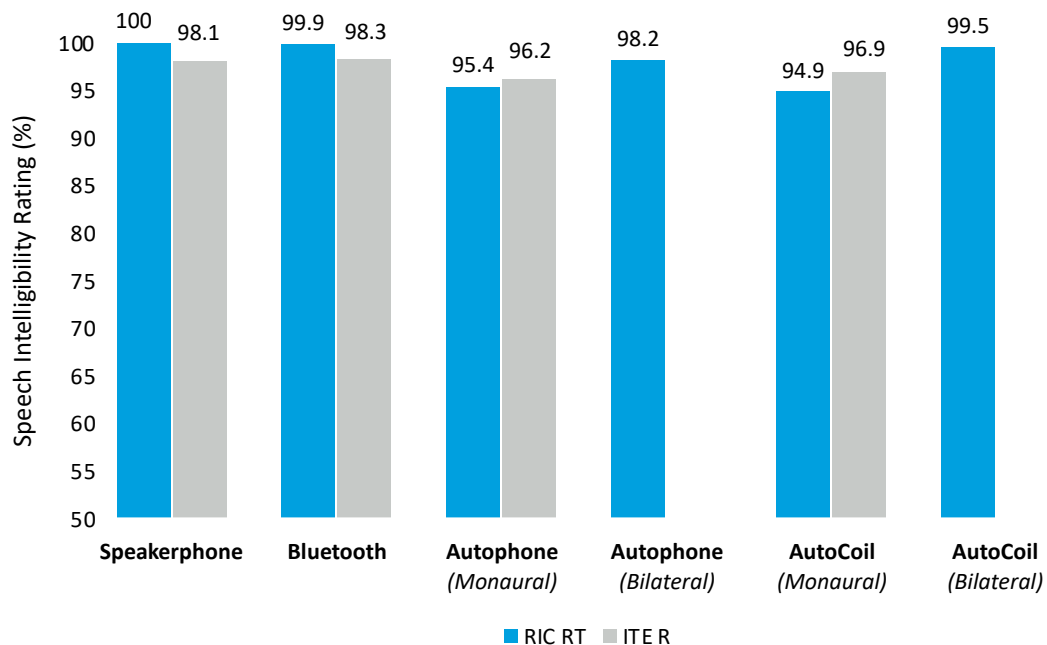
Google Maps indicates if a loop or telecoil is available at venues

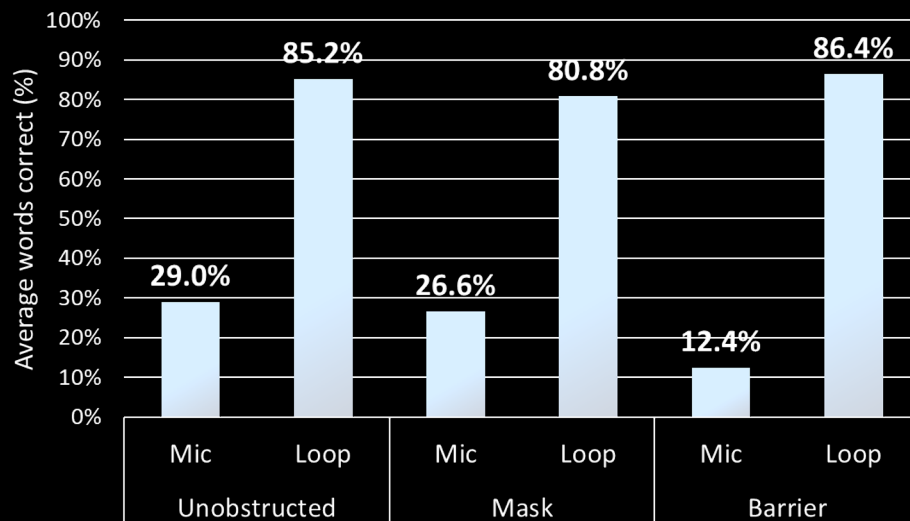
Center for Hearing Access at the Shedd Institute has Hearing Loop lists by state on their website

Telephone Options

Subjective Speech Intelligibility was estimated using the SIR for participants wearing Genesis AI RIC RT (n=13) and ITE R with telecoils (n=7)

Speech Intelligibility Rating (SIR) Test Scores





RIC RT (n=13) & ITE R w/Telecoil (n=7)

Telecoil/Loop Performance

Telecoils **significantly improve** speech understanding in degraded listening conditions

Captioning Phones

Free caption phone options

CaptionCall

ClearCaptions

Cap Tel



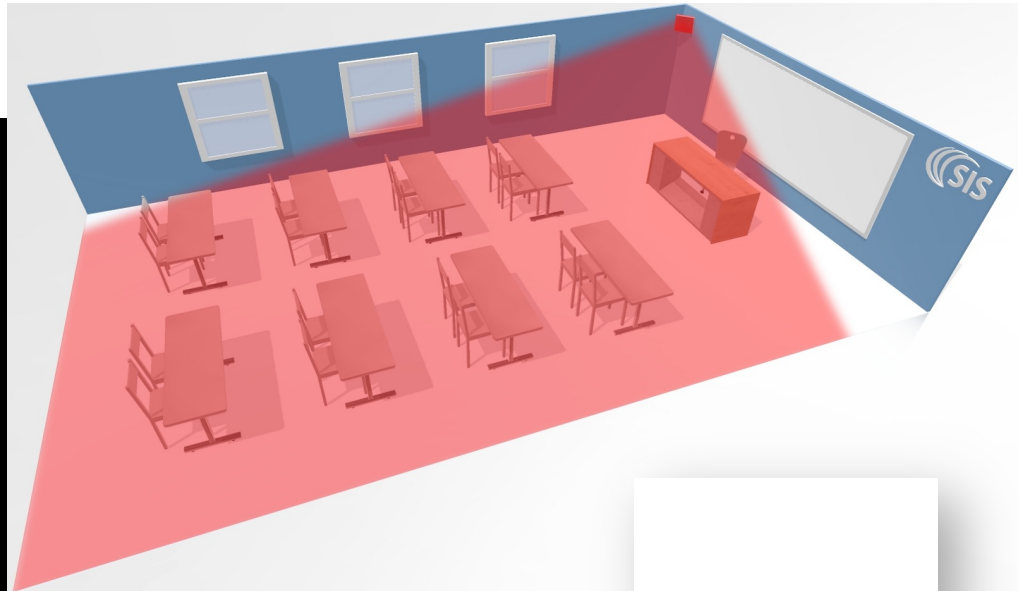
Infrared Technology

Comprised of:

Audio Source

Infrared Radiator

Infrared Listening Receivers



Symbol for
a present assistive

FM Systems

Sound field Amplification Systems:

Transmitter/Mic worn by speaker

Receivers are speakers throughout the room

Can be used and provide benefit for all within the room

Personal FM Systems:

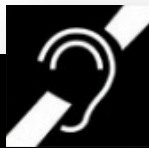
Transmitter/Mic worn by speaker

Receiver worn by hearing impaired listener

- Receivers can be ear-level such as a hearing aid or body worn/neck loop worn

Can only be used by those with a compatible receiver

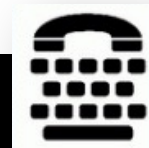
Common Accessibility Symbols



**International Symbol of
Access for Hearing Loss**



**Assistive
listening devices**



**Telephone
typewriter**



**Volume control
telephone**



**Sign language
interpretation provided**



**Closed
captioning**



**Open
captioning**



Accessories

Bring the sound source closer to the listener!

Remote Mics

TV devices

Loop detection

Deep Neural Network algorithms

May be combined with the advantages of a remote microphone and the computational power of a smartphone to allow for enhanced speech in background noise for those with more significant hearing loss



Radios within Hearing Aids



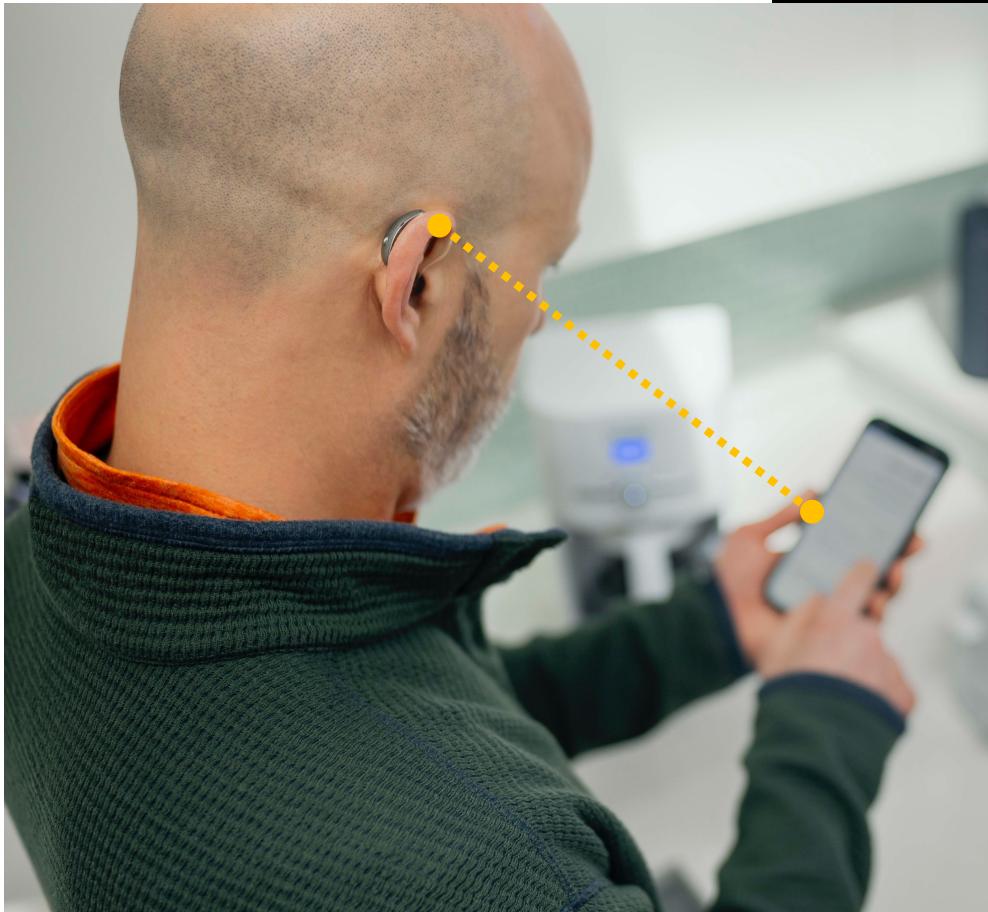
Used to Pair Hearing Aids to Accessories



Used to Pair Hearing Aids to Cellular Devices



Used for Ear-to-Ear communication between aids



2.4 GHz Radio

Range of about 30 feet with best performance within line of sight

Excellent stereo sound quality

Direct connectivity to phones & manufacturer specific accessories

Fast data transmission while maintaining low power consumption



Proprietary BTLE Protocols

2013 Starting work with Apple
(Apple's protocol was **Interdigital**
2019 by Google using the BTLE radio

Uses Bluetooth LE (not Bluetooth Classic)

Apple's proprietary **Low Energy**
Bluetooth LE protocol

Starkey was one of the first manufacturers
for Apple's **iPhone** (with **Apple** hearing aids)
and has maintained a strong partnership
with Apple

LE Audio

The Next Generation of Bluetooth® Audio



Benefits of using LE Audio



Improved audio quality

clearer sound with enhanced listening experience and better range



More efficient

the radio has low power consumption



Universal Connectivity

one protocol for compatible Apple and Android devices



Multiple connections

connect hearing aids to multiple devices at once



Auracast™

broadcast allows connection to audio sources in public places (gyms, theaters, airports) improving accessibility and

Auracast

Audio accessibility for all

Auracast transmitter will start broadcast

Auracast assistants will provide a user interface for users to select the preferred broadcast to join

Auracast receiver will join the broadcast and begin streaming the signal





Streaming Options

Edge AI will support

Apple's LEA2 streaming protocol

For both iPhone and compatible Mac computers

Android's ASHA streaming protocol

For compatible Android phones

Bluetooth LE Audio streaming

Streaming from LE Audio-compatible devices

e.g. compatible Windows 11 PCs, iPhone and Android phones (when released)

Enhanced 2-way Audio and handsfree operation are supported with compatible products

Auracast™ enabled broadcast devices

Starlink Edge TV Streamer; public broadcast system

Expected to be commercially available in 2025

Starlink Edge Accessories

Remote Microphone

Multipurpose, easy to use remote microphone



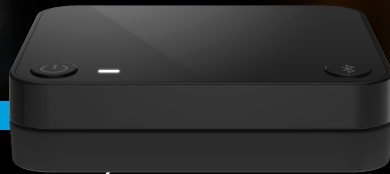
Table Microphone

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



TV Streamer

Stream audio from a TV or other sources



Remote Control 2.0

Offers simple hearing aid control





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



"I have trouble hearing my professor in class."

Remote Microphone Mode

**Streams Remote Microphone audio
directly to Edge AI hearing aids**

Enables effortless binaural streaming,
enhances one-on-one conversations in noise,
and doubles as a convenient remote control





“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

Different Listening Modes

Automatic

Table Mic follows the primary speaker automatically

Manual

The user can select which microphone(s) to activate

Surround

Manually tap all segments for all 8 mics to function at once

Mute

Manually tap all segments until only the middle circle is illuminated to mute all microphones

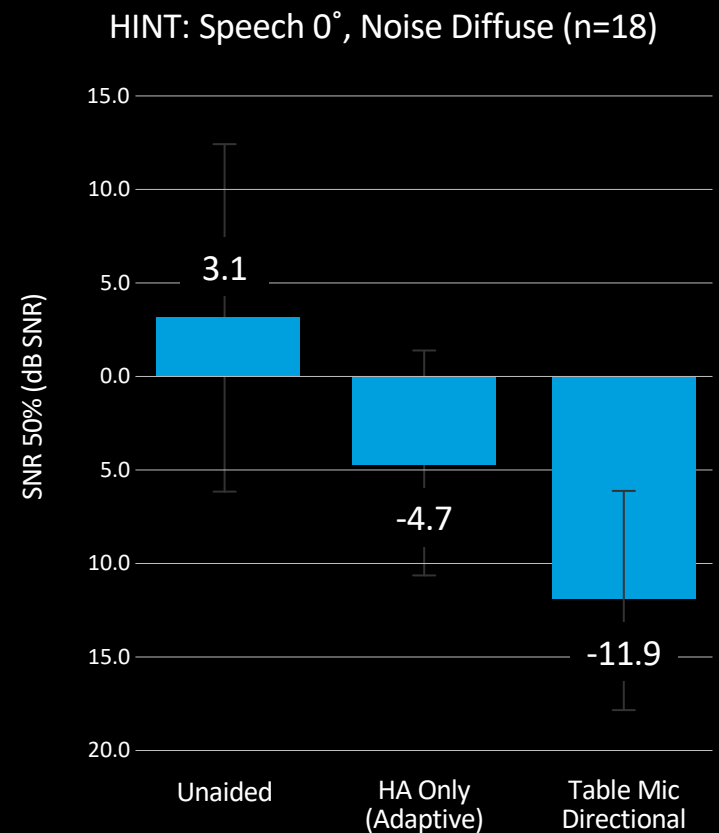
Remote Mic

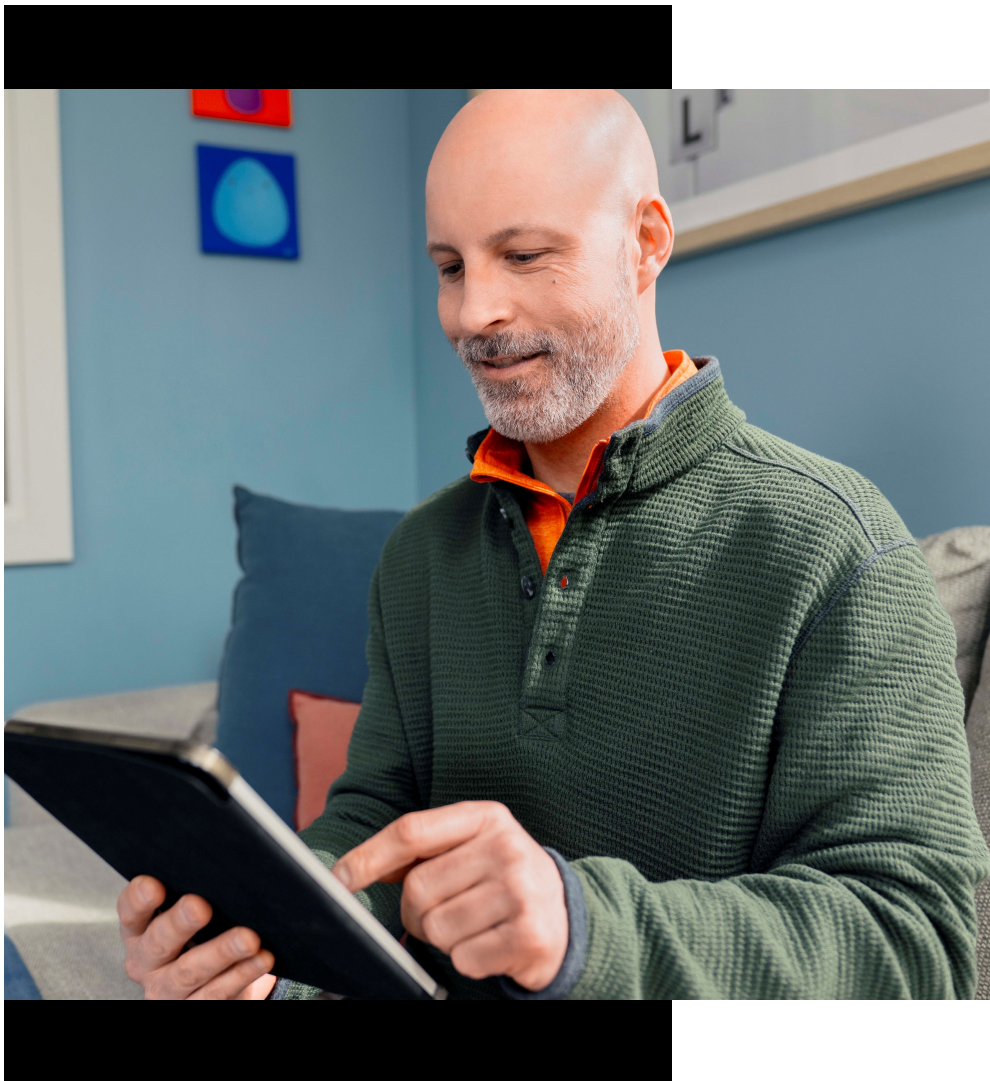
Table Mic can be worn by a conversation partner via a lanyard for one-on-one conversations



Proven Benefit

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





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*

Patient Benefit

Remote Microphones

Feature Benefits

- 1 Provide significant benefit for speech understanding
- 2 Can be worn by the speaker of interest
- 3 Reduces distractions from competing background speech or noise

Why patients will want it

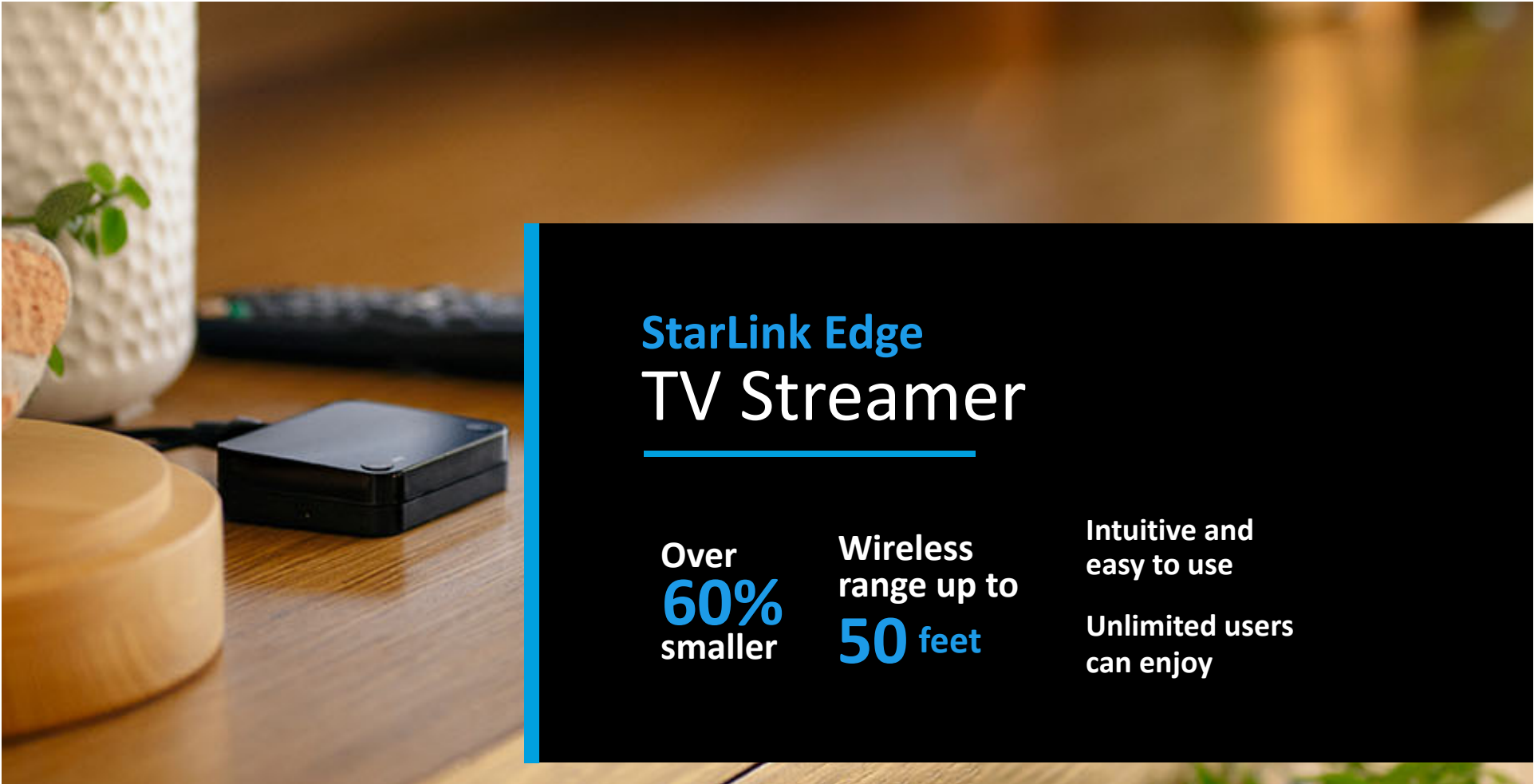
- 1 Allows patients to hear more of a conversation using less effort
- 2 Understand a speaker even at a distance
- 3 Understand and participate in conversations in noisy situations



**“Lately, we’ve been disagreeing
over the volume of the TV”**



**“I’d like to enjoy watching TV
with my grandkids again”**

A black, rectangular StarLink Edge TV Streamer is placed on a light-colored wooden surface. In the background, there is a white ceramic pot with a small green plant and a black cable. The scene is softly lit, creating a warm atmosphere.

StarLink Edge TV Streamer

Over
60%
smaller

Wireless
range up to
50 feet

Intuitive and
easy to use

Unlimited users
can enjoy

StarLink Edge TV Streamer

Using with Other Auracast-enabled Hearing Aids

An unlimited number of 2.4 GHz Auracast™ enabled hearing aids can connect to the TV Streamer at one time to share the same listening experience

NOTE

User will need to search and accept the broadcast stream each time they want to stream audio from the TV Streamer

- 1 Ensure TV Streamer is plugged into power outlet and connected to streaming device
Optical Toslink recommended
- 2 Power on TV Streamer and audio source
- 3 From the LE Audio compatible smartphone, navigate to the available Auracast Broadcast Assistant screen
- 4 Select **Broadcast Name**: TV-(7-digit number)
This is the unique name on the bottom of the streamer
- 5 When prompted by the LE Audio device, Enter the **Broadcast Code** (6-digit number)
This is the unique code on the bottom of the TV Streamer
- 6 When the Broadcast Code is entered, streaming will begin through the hearing aids

Patient Benefit

TV Streamer

Feature Benefits

- 1 Wireless connection directly to hearing aids
- 2 Unlimited wearers can stream from each TV streamer device
- 3 Multiple streamers can be used in the home environment

Why patients will want it

- 1 Can enjoy TV viewing with loved ones at a volume that's comfortable for everyone
- 2 Can set up a separate streamers for each TV in their home

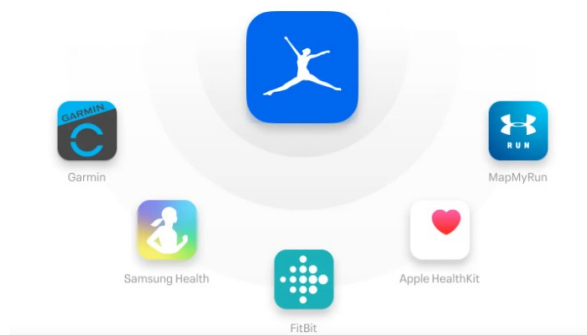


Assistive Living Features

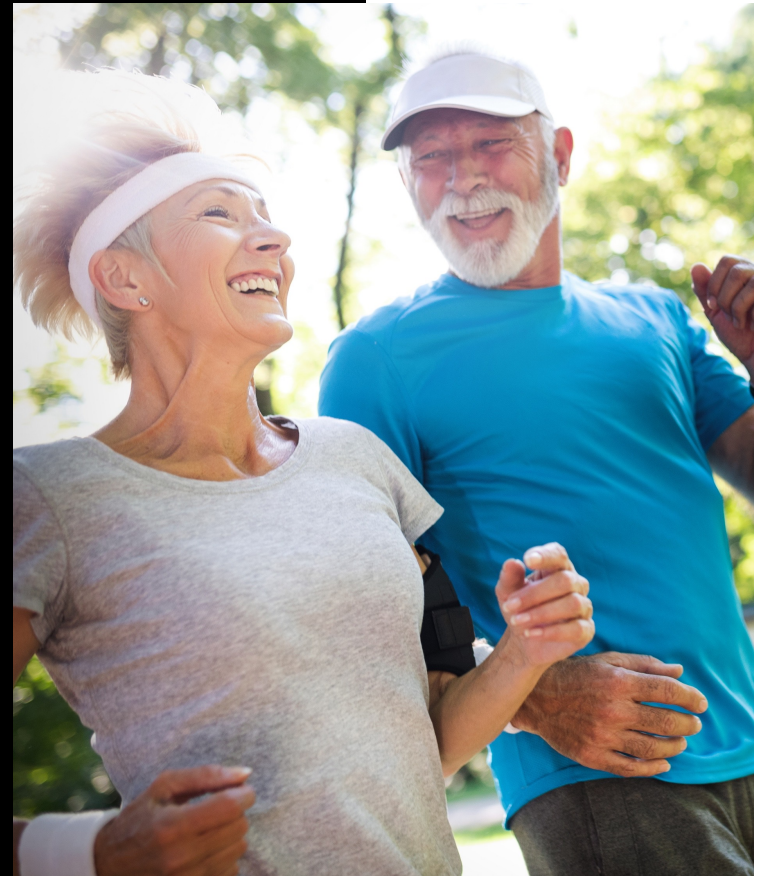
**Features within hearing aids
designed to promote better health
and wellness for today's users**

Expanding the Utility of Hearing Aids

Wearable technology popularized in 2008: Fitbit



followed



Alerting features for health, safety, and more



Falls



**Health
monitoring devices**



Transcription



Translation

Personal Health Monitoring

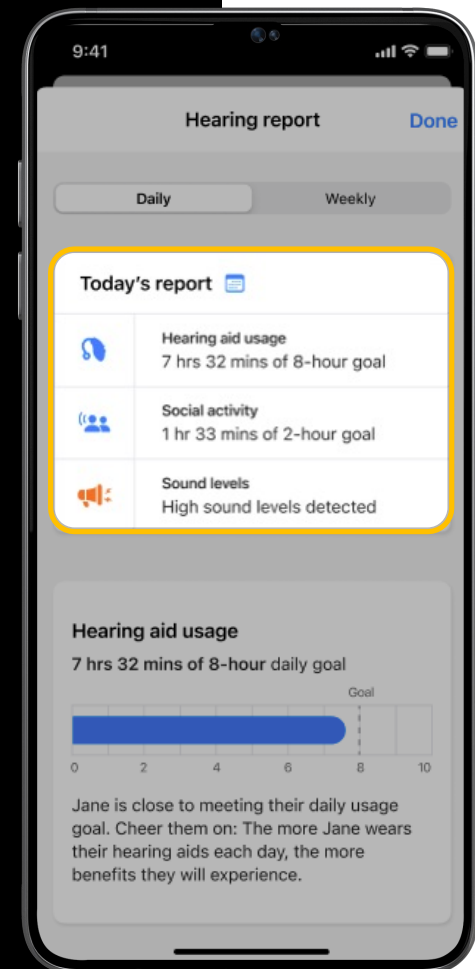
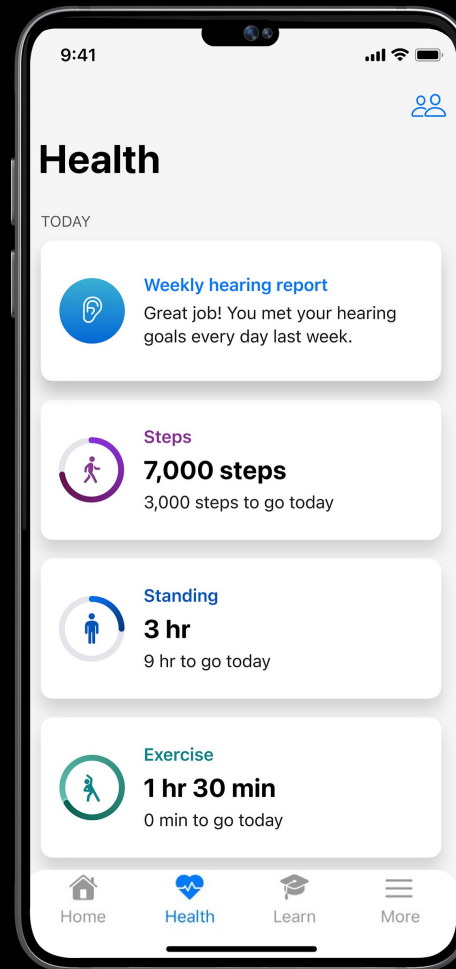
Monitor hearing health with targeted hearing goals

Monitor fitness through targeted fitness goals

Report Options:

Daily Usage

Weekly Averages and Performance



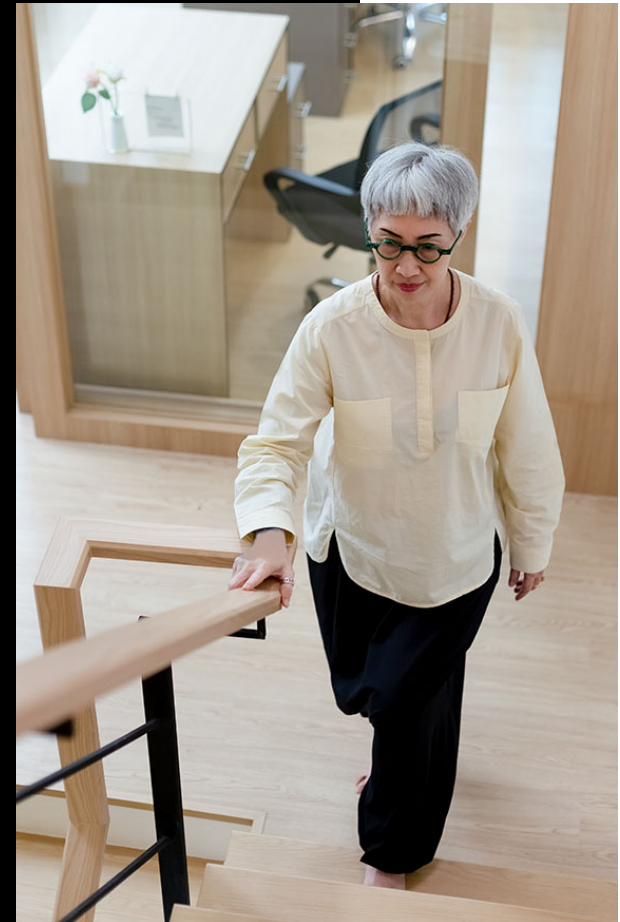
Hearing Loss and Risk of Falls

Individuals with hearing loss:
2.39 increased odds of falling

Every 10 dB of hearing loss:
1.4-fold increased odds of falling

There is evidence of an association of an improved
sense of balance with treatment using hearing aids

Borsetto et al: The Influence of Hearing Aids on Balance Control: A Systematic Review. *Audiol Neurotol*,
2021;26:209-217



Fall Alert

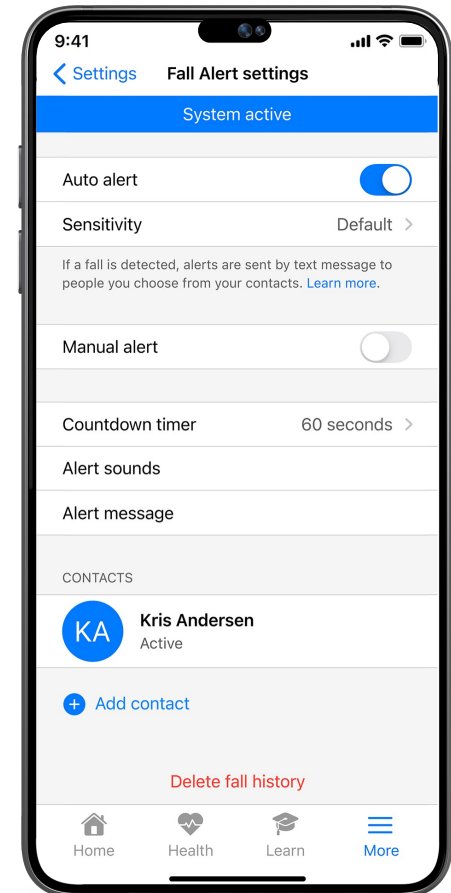
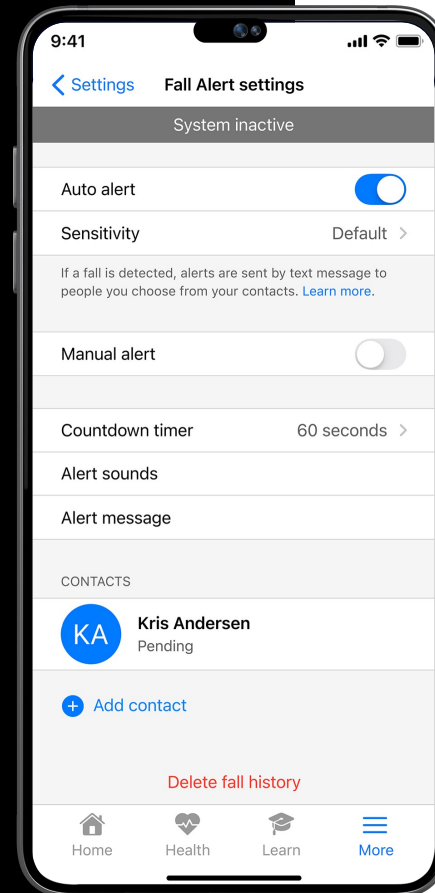
Starkey are the only hearing aids that:

Detect falls automatically

Sends an alert message to enabled contacts

**Must have contacts invited via
My Starkey**

**App Must be running in the
background for alerts to trigger**





Auto Alert



Manual Alert

Two Ways Alerts Can Be Sent



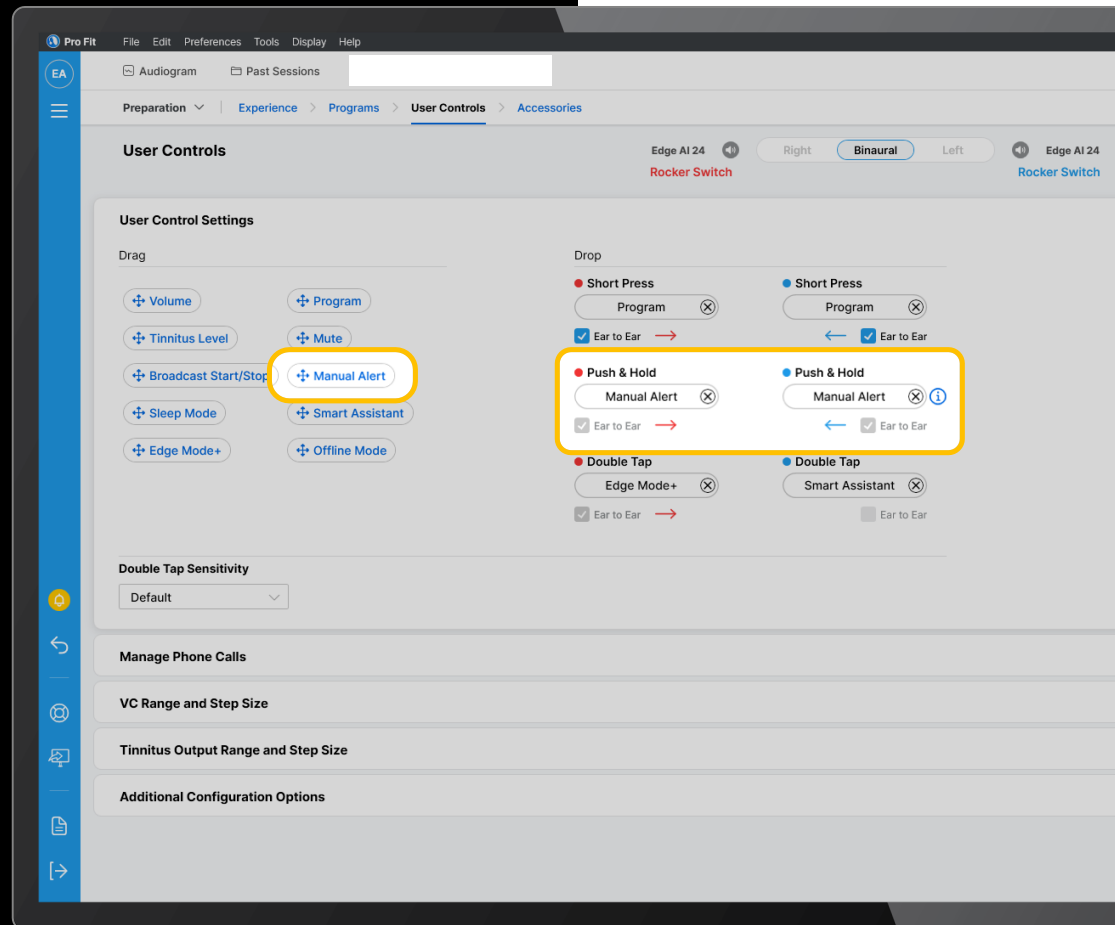
"I am beginning to feel faint and lightheaded"



**Manually triggered alert
received by Fall Alert Contact**

Manual Alert Enabling Manual Alert in the Hearing Aids

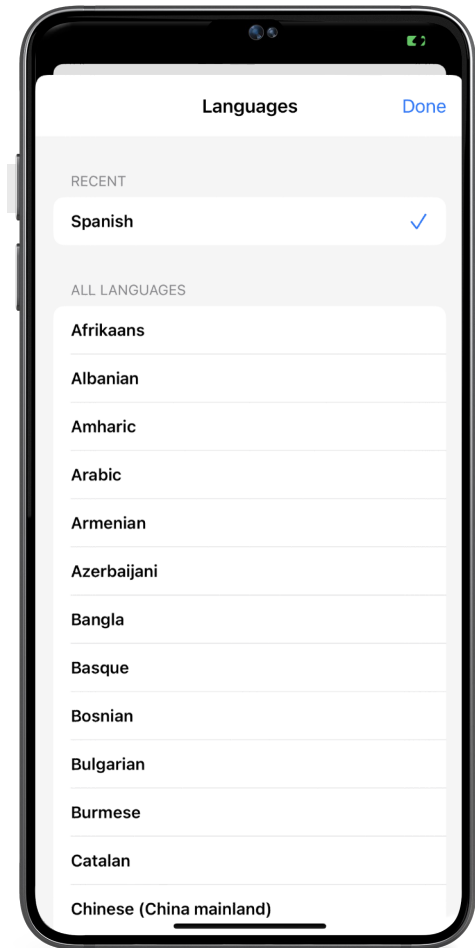
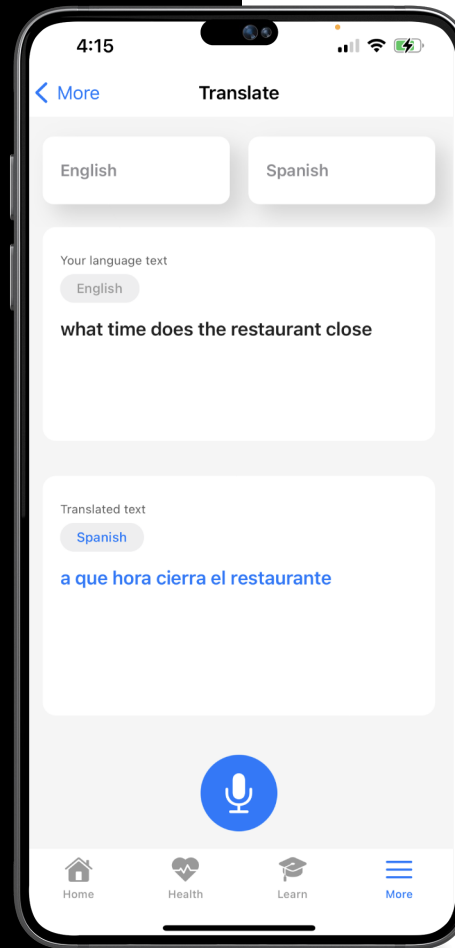
Push and hold gesture only



Translate

Easily communicate with speakers of other languages

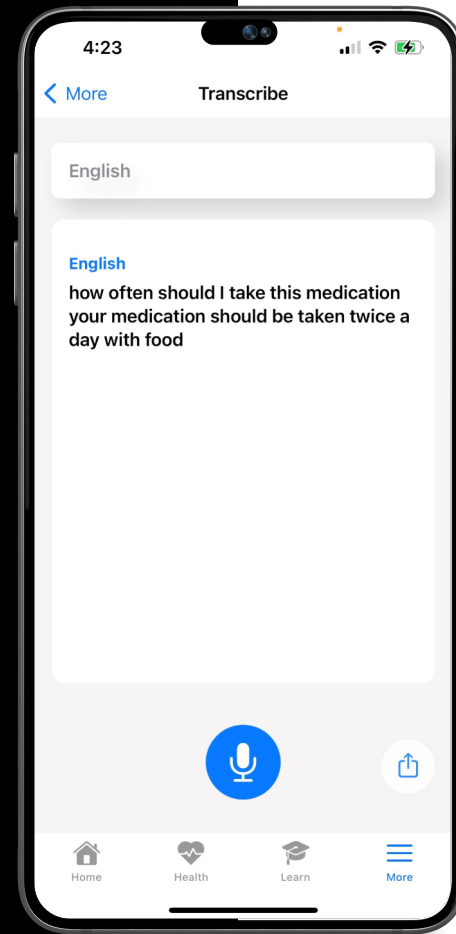
Accessible via My Starkey
24 technology tier



Transcribe

Transcribe conversations into text that can be saved or shared

Accessible via My Starkey
24 and 20 technology tier



Smart Assistant

Make voice activated hearing aid adjustments or get quick answers to questions

Troubleshoot hearing aids or accessories

Change volume, programs, reminders and more

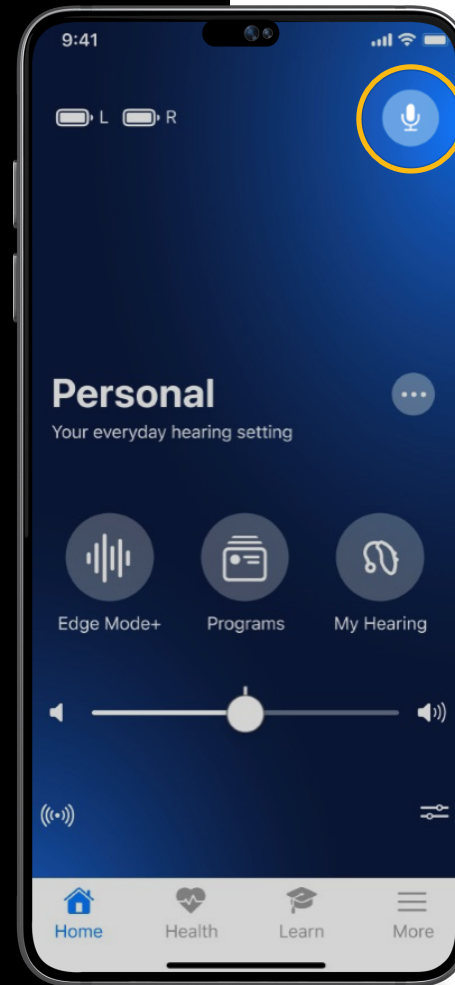
Help files, internet searches

Accessible via:

Smart Assistant (microphone) icon on the Home page of My Starkey

Tap Control set to Smart Assistant enabled via Pro Fit

24, 20, and 16 technology tier



Intelligent Reminders

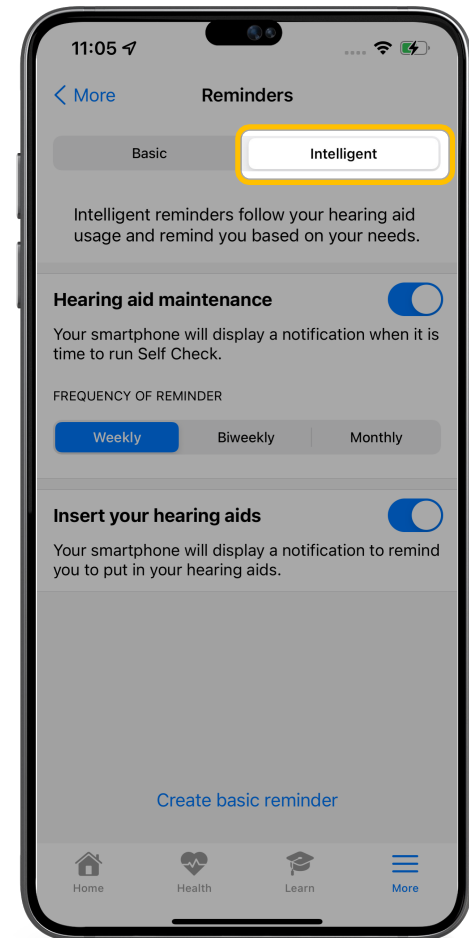
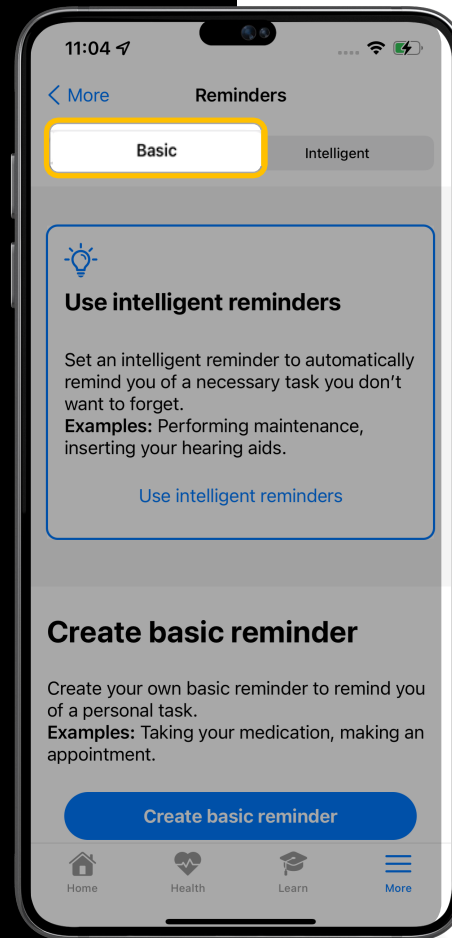
Basic Reminders

Stream alerts through the hearing aids for appointments, taking medications or other tasks

Intelligent Reminders

Notification for inserting hearing aids and hearing aid maintenance

Enabled/Disabled through My Starkey





Alerting Devices

Devices utilizing visual and tactile cues to alert users to important events



Alerting and Vibrating Devices

Tactile Alerts

Vibrating Bed Shakers

Vibrating Wristbands

Vibrating Baby Monitors

Vibrating Wearable Technology

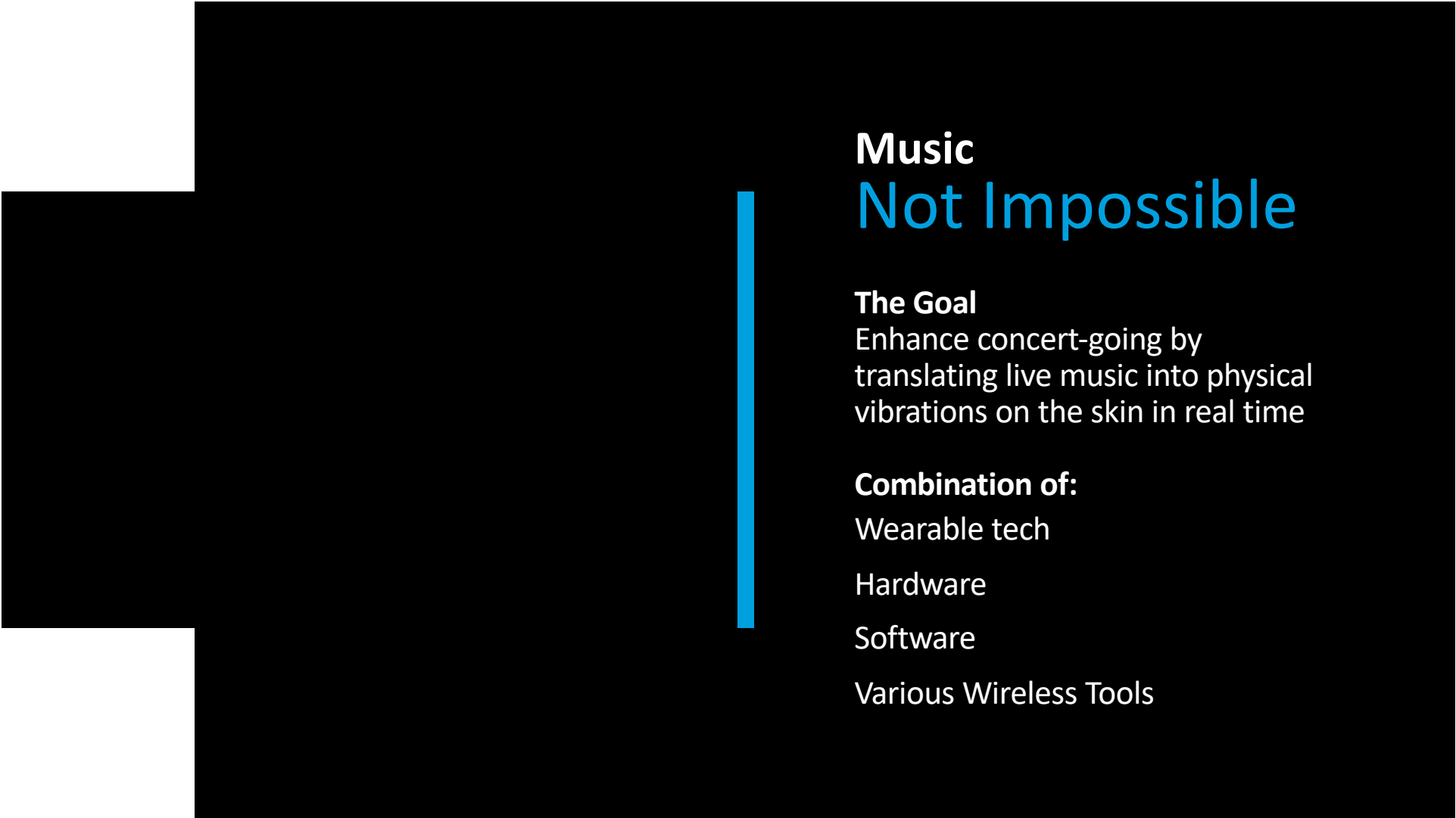
Visual Alerts

Strobe Lights

Flashing Lights

Light Indicators on Smartphones

Smart Home Integration



Music Not Impossible

The Goal

Enhance concert-going by
translating live music into physical
vibrations on the skin in real time

Combination of:

Wearable tech

Hardware

Software

Various Wireless Tools

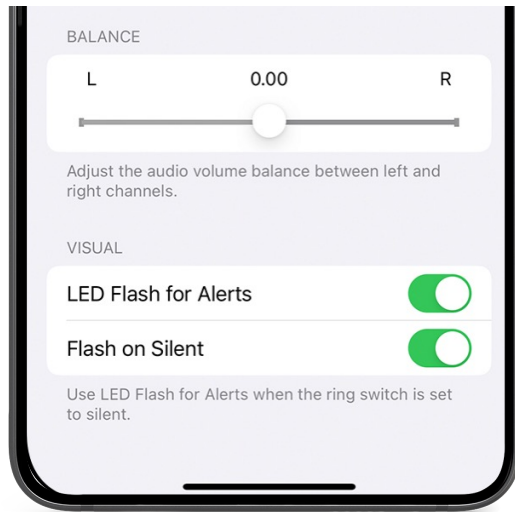
iPhone Sound Recognition

Accessibility feature that could help hearing impaired users to hear specific environmental sounds nearby

Notifications can trigger if the iPhone hears specific sounds

Specific sounds for alerts may be selected from a menu in Settings



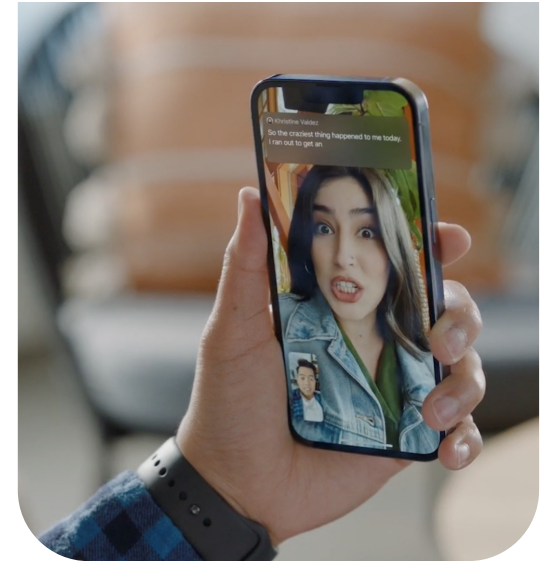


Other iPhone Accessibility Options

Music Haptics

Refined vibrations that sync with audio

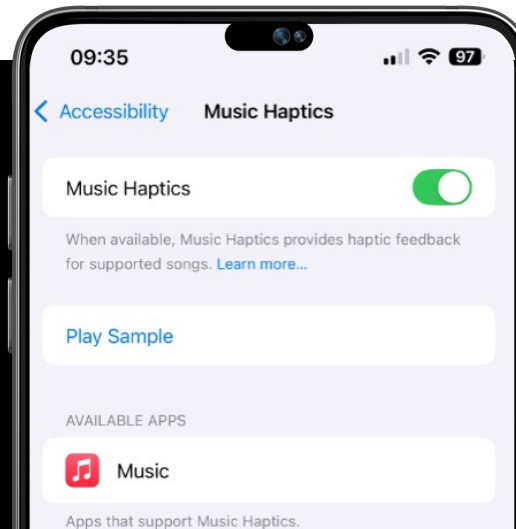
1. Go to Settings > Accessibility > Music Haptics
2. Turn Music Haptics on
3. Controlled through Control Center



LED Flash Alerts

Visual indicator for notifications

1. Open the Settings app, tap Accessibility, then
2. Tap Audio/Visual
3. Turn on LED Flash for Alerts



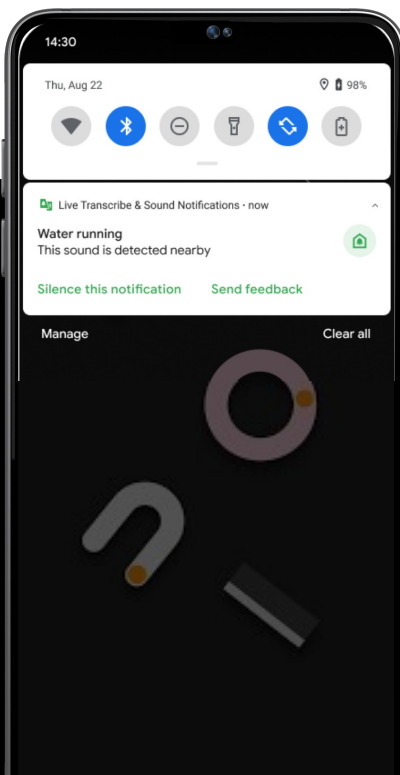
Live Captions

Automatically transcribe spoken audio into text

1. Go to Settings > Accessibility > Live Captions
2. Tap Appearance to customize text/size/color of the captions

Android Features

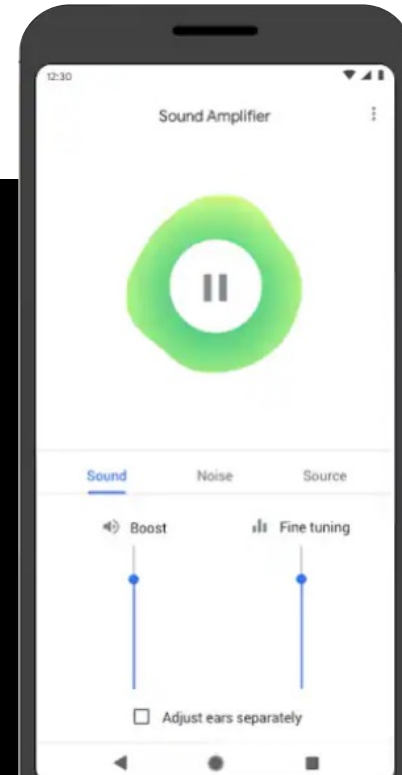
Sound Notification



Live Caption



Sound Amplifier



Apps for Hearing Impaired

Real Time Transcription and Captioning

Ava

Google Live Transcribe/
Live Captions

Caption Call Mobile

Sound Amplification and Enhancement

Sound Amplifier (Android)

Volume Boost (iOS)

Hear Boost Sound
Amplifier

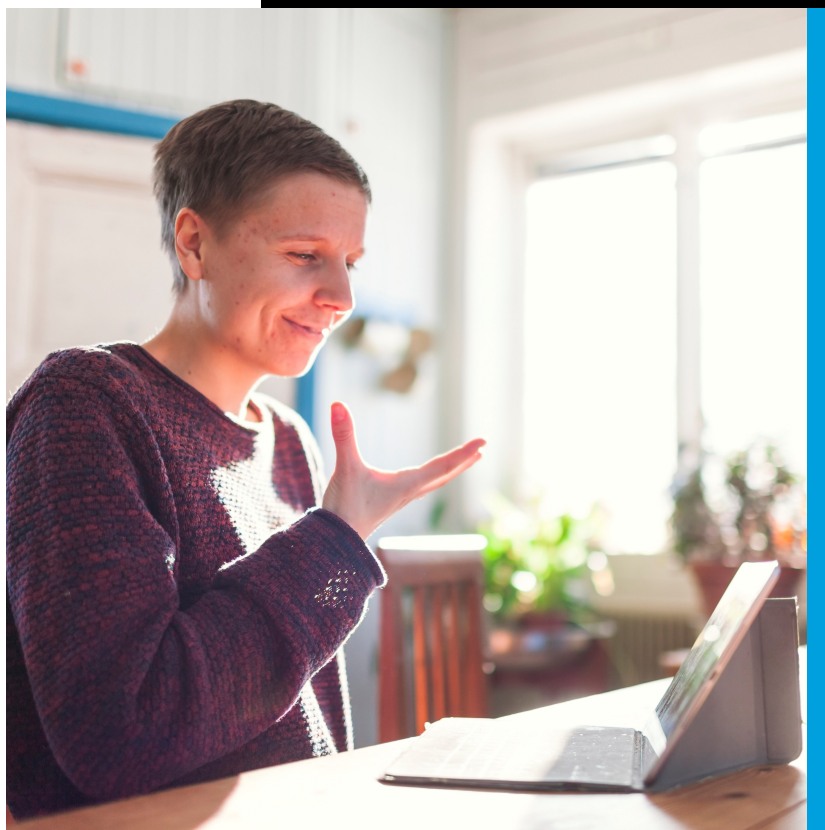
Other Helpful Apps

Otter.ai

Braci Sound Alert

Deaf Wake

SoundPrint



Assistive Technology

Can be

Built directly into hearing aids

Integrated into homes and daily lifestyles

Accessed through smart phones

Beneficial to more than just the intended user

Assistive Technology



 **AURACAST**
A BLUETOOTH® TECHNOLOGY



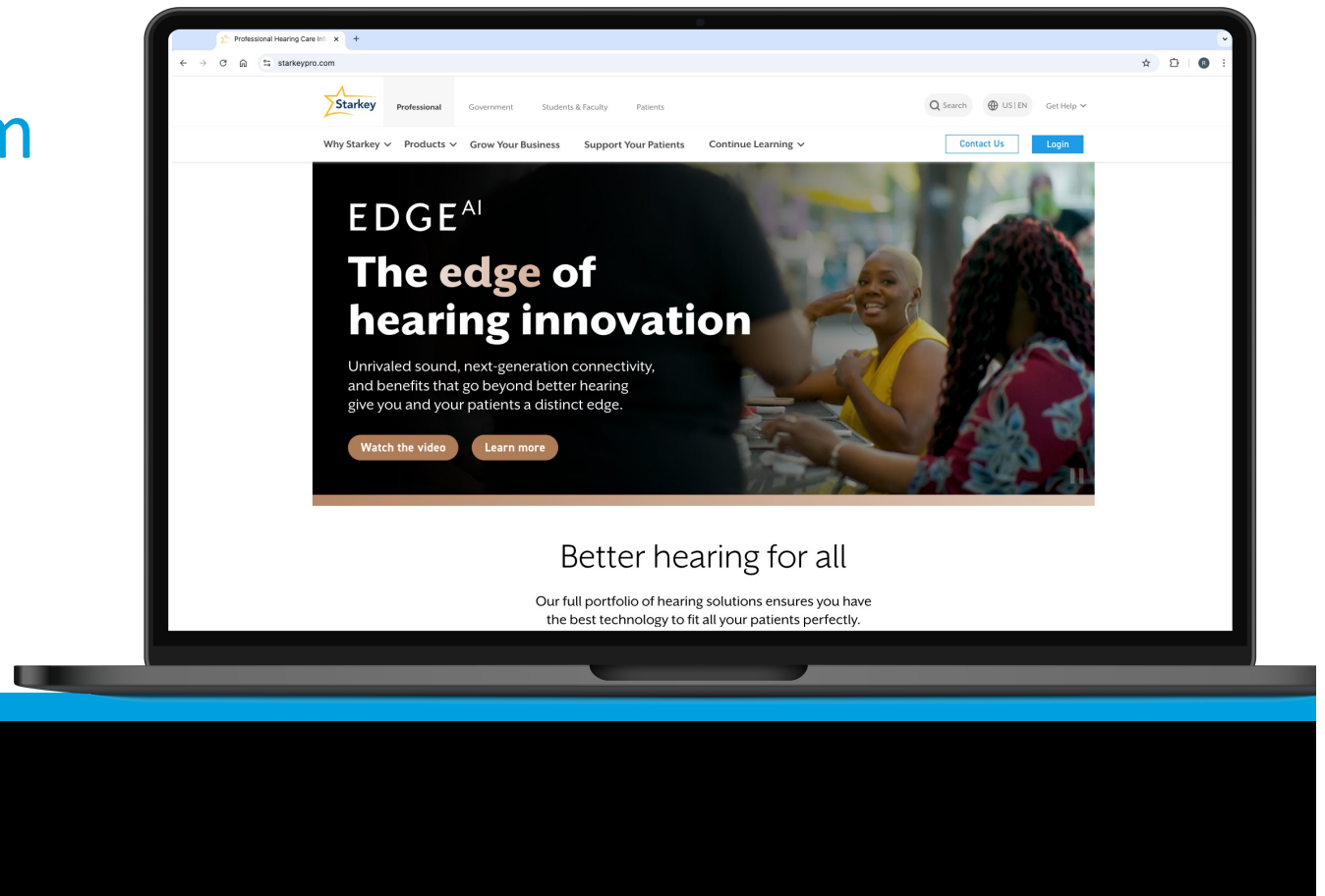
Starkeypro.com

White Papers

Quick Tips

Videos

Training Opportunities





Resources

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Thank You

