

Closing the Hearing Aid Connectivity Gap

Luis F. Camacho, AuD, FAAA





Risks and 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.

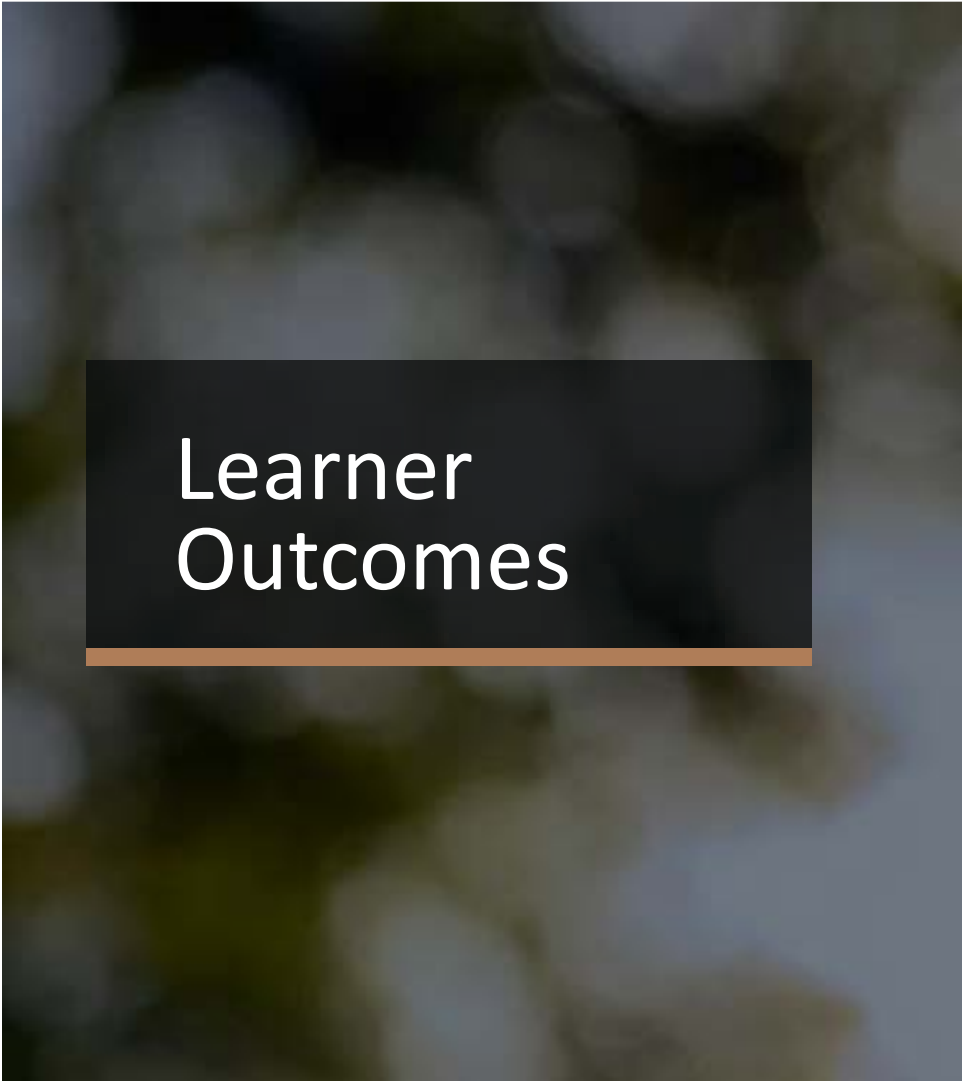
The interventions discussed in this course may be limited in generalizability, requiring practitioners to consider specific individual and population factors.

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 screening 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 define LE Audio.
- After this course, participants will be able to identify the difference between unicast and broadcast devices.
- After this course, participants will be able to list two common troubleshooting techniques.

Webinar FAQs

Closing the Hearing Aid Connectivity Gap

Luis Camacho, Au.D.

How to Ask a Question

Click Q & A, type your question, and Send

Where to get the handout

A PDF handout for this presentation may be accessed through your Pending Courses on Audiology Online or by clicking on the link in Chat within the classroom

How to earn CEUs

CEUs are available with a paid Audiology Online Unlimited CEU Access membership

After completing the course, go to your Pending Courses on Audiology Online and pass the multiple-choice exam

Assistance or Tech Support

Call 800-753-2160

customerexperience@continued.com

Use the Q&A window



History of Wireless Technology in Hearing aids

- | | |
|------|--|
| 1937 | T-coil invented for use with telephones |
| 1990 | Near Field Magnetic Induction (NFMI) introduced |
| 2005 | Starkey introduced ELI |
| 2019 | Google released Audio Streaming for Hearing Aids (ASHA) protocol for Android |
| 2020 | Bluetooth® SIG introduced the LE Audio protocol |
| 2024 | First Bluetooth LE Audio products introduced to the market |



**Making
connectivity
*a constant***

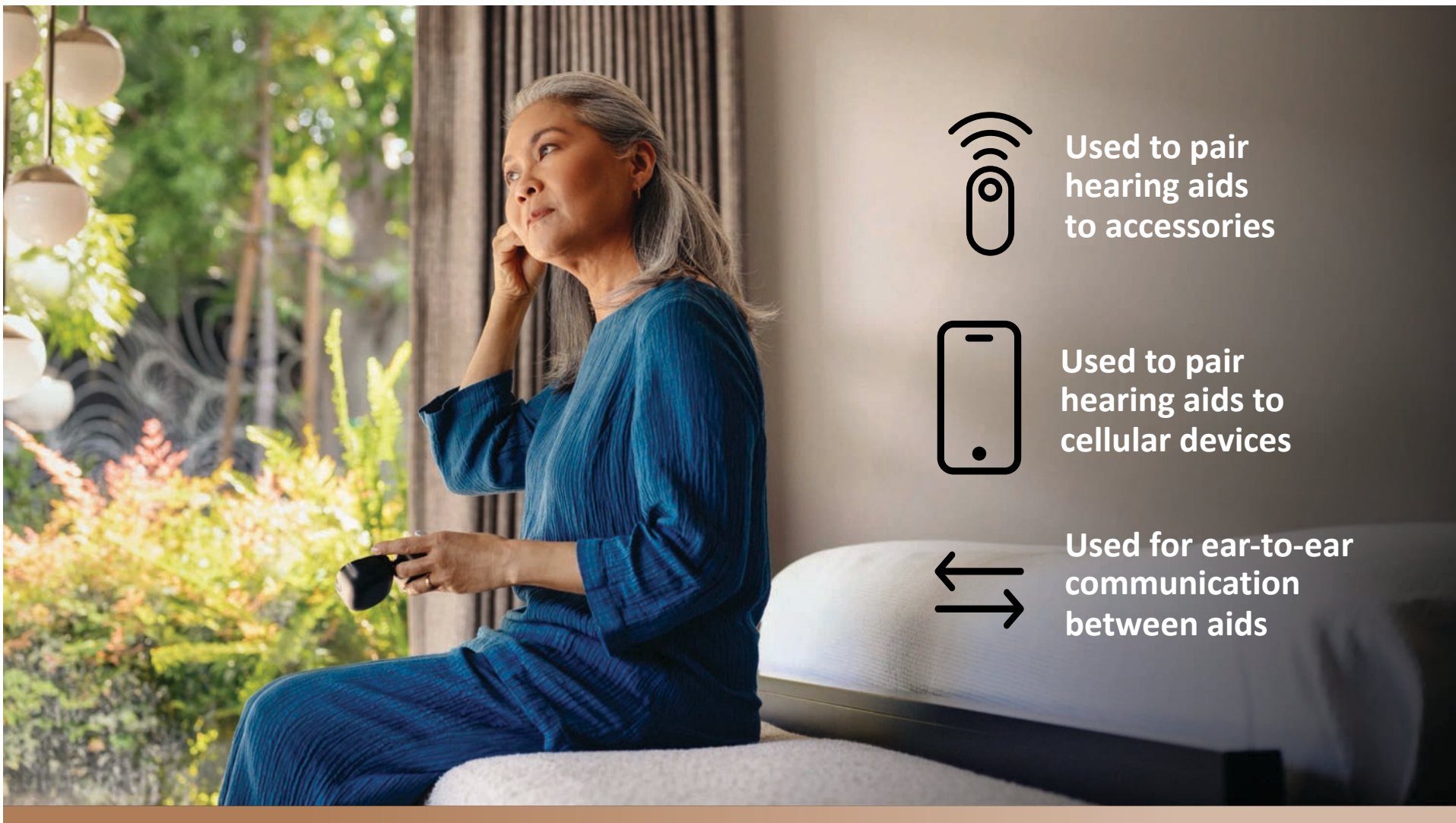
A photograph of a smiling woman with short grey hair, wearing a white t-shirt and orange overalls, standing outdoors in a garden setting. The background is blurred, showing green foliage and a wooden fence.

What is Connectivity

The ability to link to and communicate with other computer systems, electronic devices, software, or the internet

A photograph of a middle-aged woman with short, grey hair, smiling warmly at the camera. She is wearing a white t-shirt under an orange jumpsuit. The background is a blurred outdoor setting with green foliage and a wooden bench. A dark grey rectangular box with a thin orange border is overlaid on the right side of the image, containing the text 'Radios within Hearing Aids' in white.

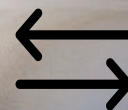
Radios within Hearing Aids



Used to pair
hearing aids
to accessories



Used to pair
hearing aids to
cellular devices



Used for ear-to-ear
communication
between aids

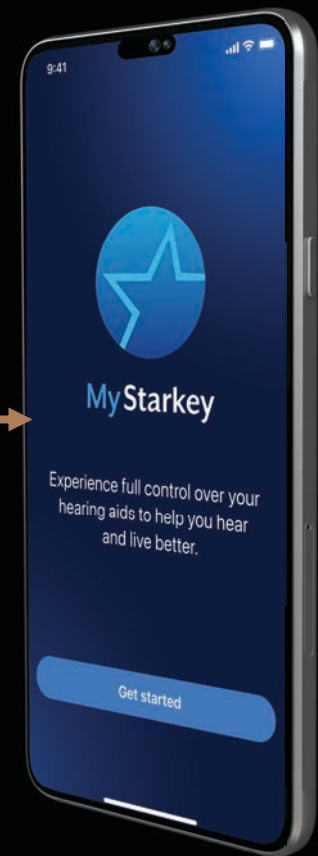
2.4 GHz

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

Excellent stereo sound quality

Direct connectivity to phones and manufacturer specific accessories

Fast data transmission while maintaining low power consumption



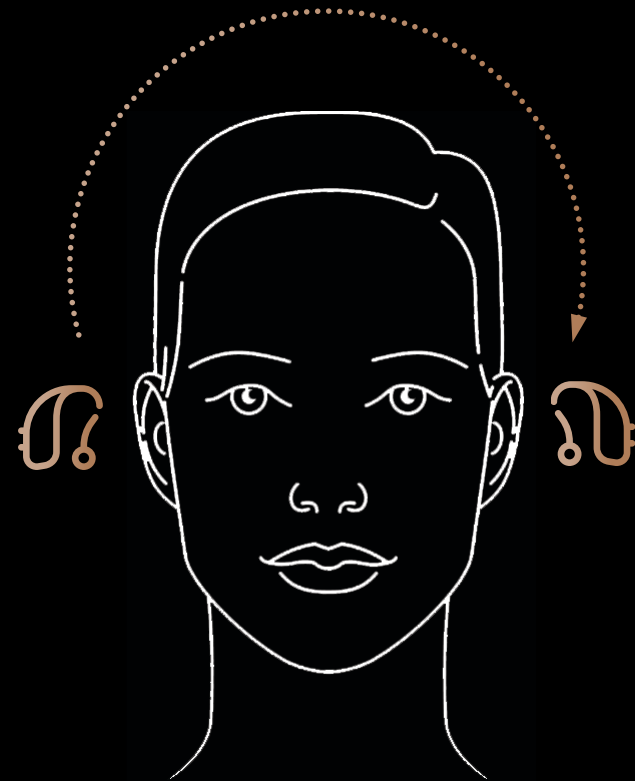
NFMI

Highly reliable over short distances
approx. 20 cm

Direct ear-to-ear communication

Ear-to-ear User controls

Binaural environmental detection and
coordination of signal processing



NFMI

Near Field Magnetic Induction



What is Streaming

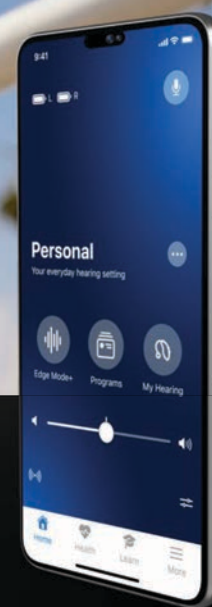
Receiving audio from an electronic source



Accessories



Media
Music, podcasts, etc



Phone calls

A man with a beard and a plaid shirt is smiling while looking at a smartphone. He is sitting at a desk in a modern, brightly lit office or home workspace. A dark rectangular box with the word "Bluetooth" in white text is overlaid on the left side of the image.

Bluetooth

Solution Areas

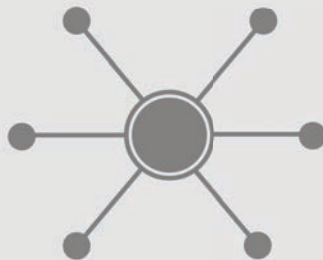


AUDIO STREAMING



DATA TRANSFER

Device Communication



POINT - TO - POINT

What is Bluetooth? And why is it called that?

Bluetooth Classic® is a low power radio that streams data in the unlicensed industrial, scientific, and medical (ISM) 2.4 GHz frequency band



Bluetooth allows wireless communication between two devices

*Primarily designed for **data transfer** but can support audio streaming*

What is Bluetooth Low Energy?

Bluetooth Low Energy (BTLE) was designed to use even less power than Bluetooth Classic



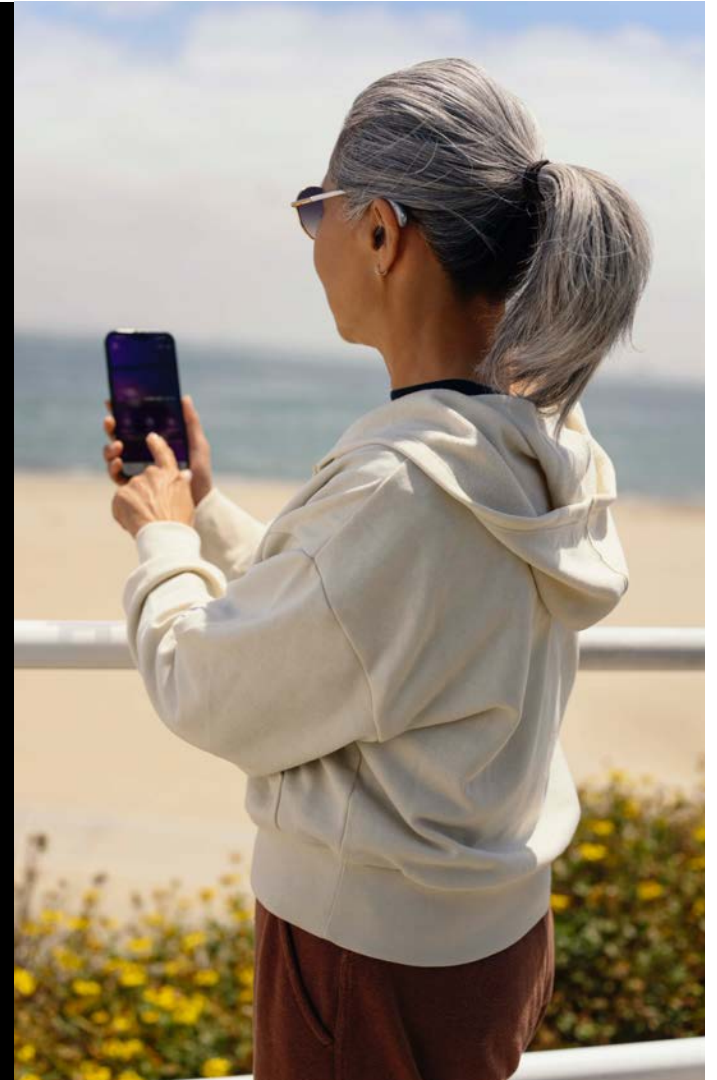
BTLE provides more flexibility in communication between devices



Used for data transfer and some audio streaming



Provides precise indoor location services



Bluetooth Low Energy



Central Devices

Scans for other devices and initiates a connection

Common that one central device initiates and maintains connections with multiple peripherals



Peripheral Devices

A low-power device that provides data

Accepts an incoming connection request after advertising its presence to other devices



Central Device
(i.e. smartphone)

Peripheral
(i.e. heart rate monitor)



Peripheral
(i.e. smartwatch)



Central Device
(i.e. smartphone)

Peripheral
(i.e. hearing aid)



Peripheral
(i.e. temperature sensor)



Bluetooth® Audio

Classic Audio

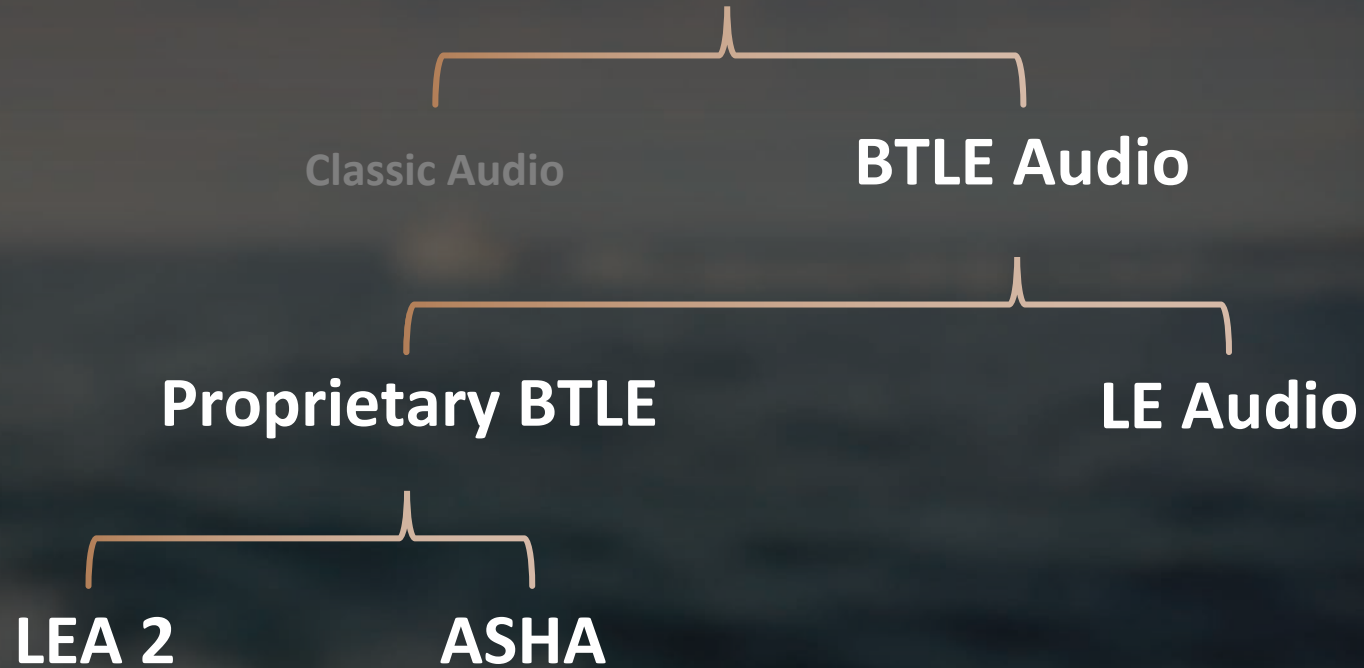
BTLE Audio

Proprietary BTLE

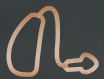
LE Audio

LEA 2

ASHA



Considerations with Current Streaming Technologies



Poor range

Hearing aids must be close to the device to receive uninterrupted audio streaming



Handsfree is not supported with all devices



Efficiency

Possible power drain on both smartphone and hearing aids



Inconsistent pairing of hearing aids to smartphones

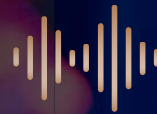
What is LE Audio?

Bluetooth LE Audio is a new protocol that operates on the BTLE radio as part of the Bluetooth Core Specification version 5.2



Transmitter Source

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 participation

Bluetooth® Audio

Classic Audio

BTLE Audio

Proprietary BTLE

LE Audio

LEA 2

ASHA

Unicast

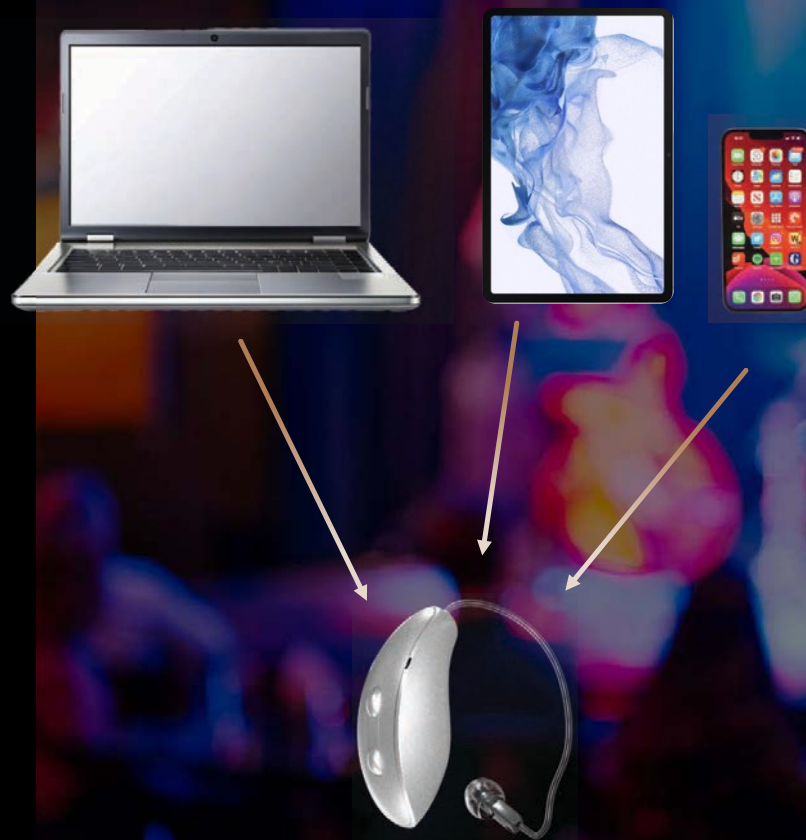
Broadcast

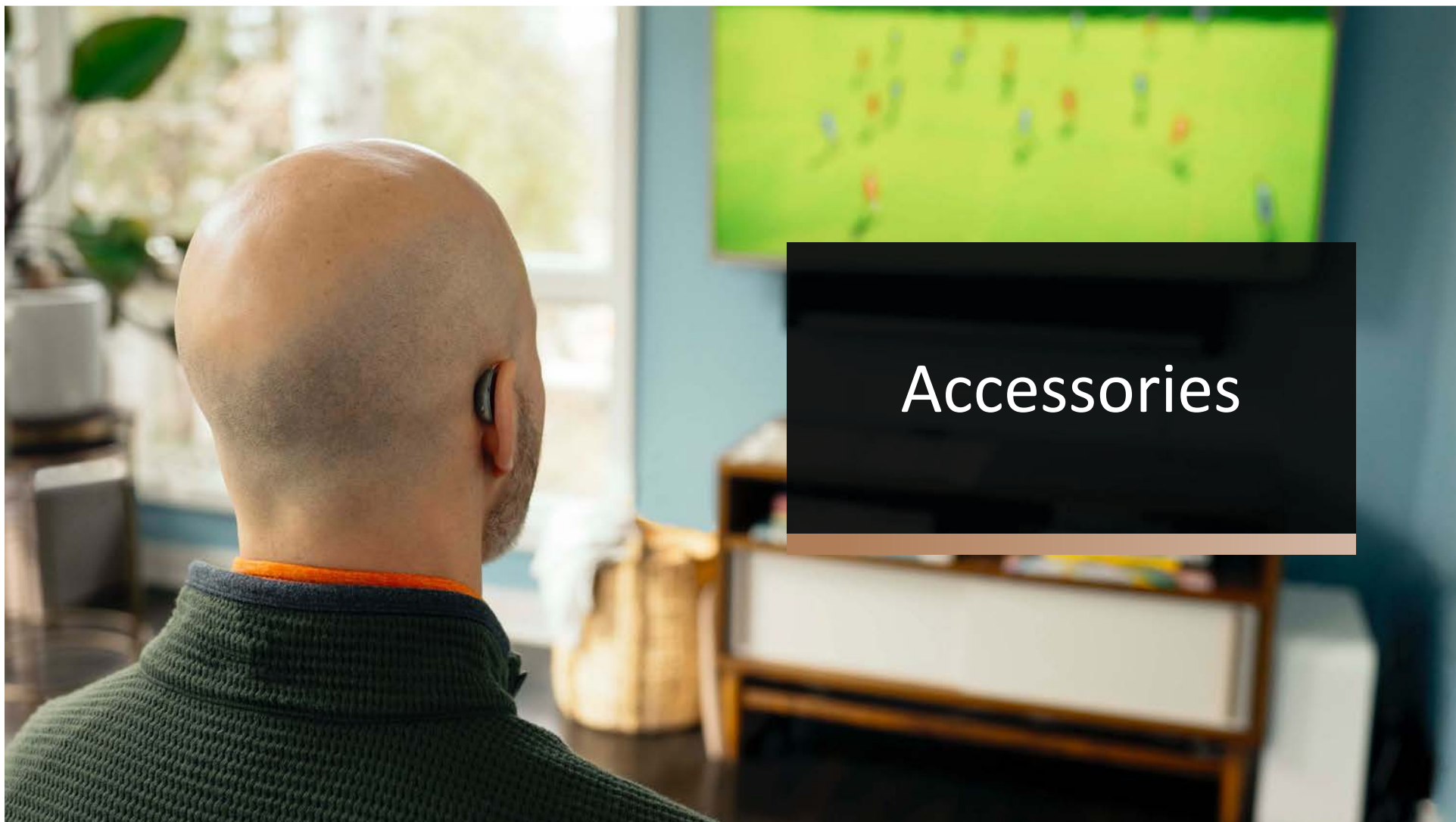


LE Audio Unicast

Enables direct streaming from a variety of device types including smartphones, tablets, and personal computers

Improved wireless range and streaming sound quality





Accessories

StarLink Edge Wireless Accessories

ALL
NEW

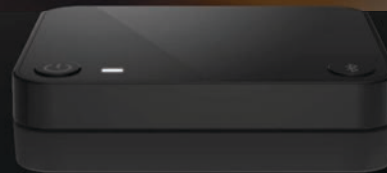


StarLink Edge
Table Microphone

ALL
NEW



StarLink Edge
Remote Microphone



StarLink Edge
TV Streamer



StarLink
Remote Control 2.0

StarLink Remote Control 2.0

Favorite Button Options:



Home

NEW Stop a stream

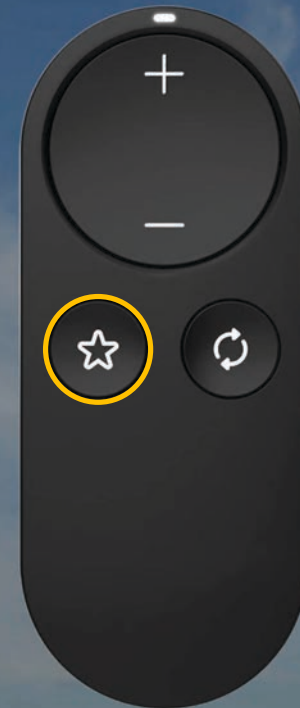
Broadcast Start/Stop

Edge Mode+

None

Jump to Program 4

Tinnitus On/Off





StarLink Edge
TV Streamer

Over
60%
smaller

Wireless
range up to
50 feet

Intuitive and
easy to use
Unlimited users
can enjoy



StarLink Edge Table Microphone

Key Features



Battery charge time

2 hours



Streaming time up to

10 hours



Operating range (*15 meters*)

up to 50 feet*

*Presumes line of sight and no interference

Listening Modes



The StarLink Edge Table Mic has multiple listening modes:

Automatic, Manual, Surround, and Remote Mic

For best listening, the Table Mic should be placed as close as possible to the conversation partner(s)

Place the Table Mic with the power and volume control buttons facing toward the hearing aid user

Remote Microphone

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

The Table Mic should be within 8 inches (20 cm) of the speaker's mouth

The top segment will illuminate for 3 seconds

Tap the middle to return to Automatic mode



StarLink Edge Remote Microphone

Key Features



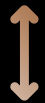
Battery charge time

3 hours



Streaming time up to

10 hours



Operating range

up to 50 feet





Remote Control Functions

A short press of the volume buttons up or down will adjust the hearing aid volume

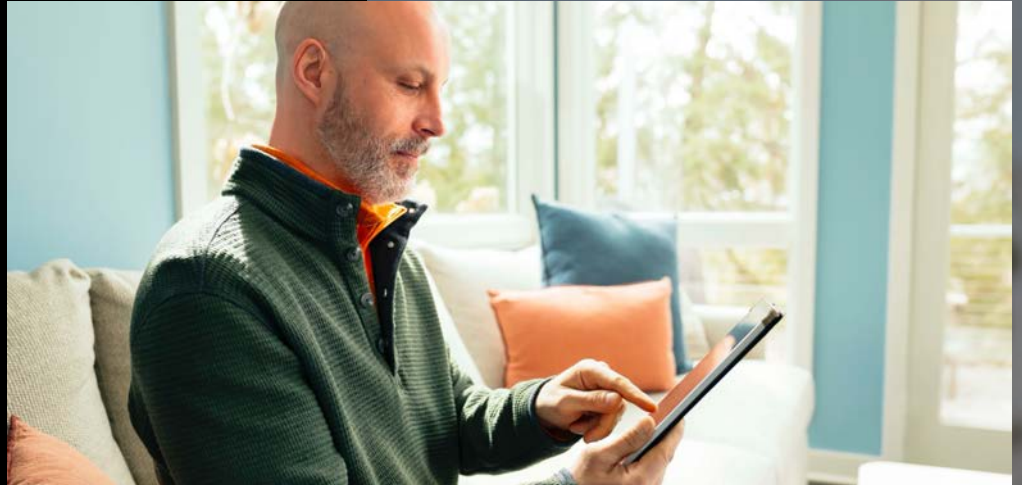
A long press of the volume control will cycle through hearing aid programs



Connectivity Tips

Connectivity Checkpoints

- ① Hearing aid firmware and phone operating system is up-to-date
- ② Phone/Accessory/Hearing aid are all compatible
- ③ Devices are properly paired and connected

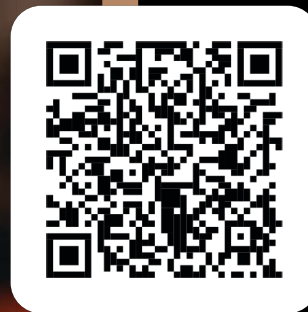
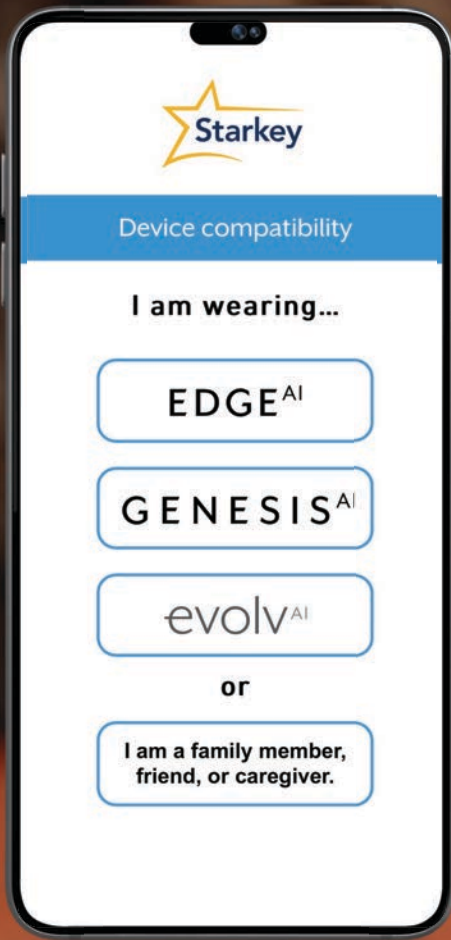


MyStarkey

**A control center
for hearing aids**

Change programs and
adjust volume quickly
and easily, even with
an Apple Watch





My Starkey

Smartphone Compatibility

Streaming Checklist

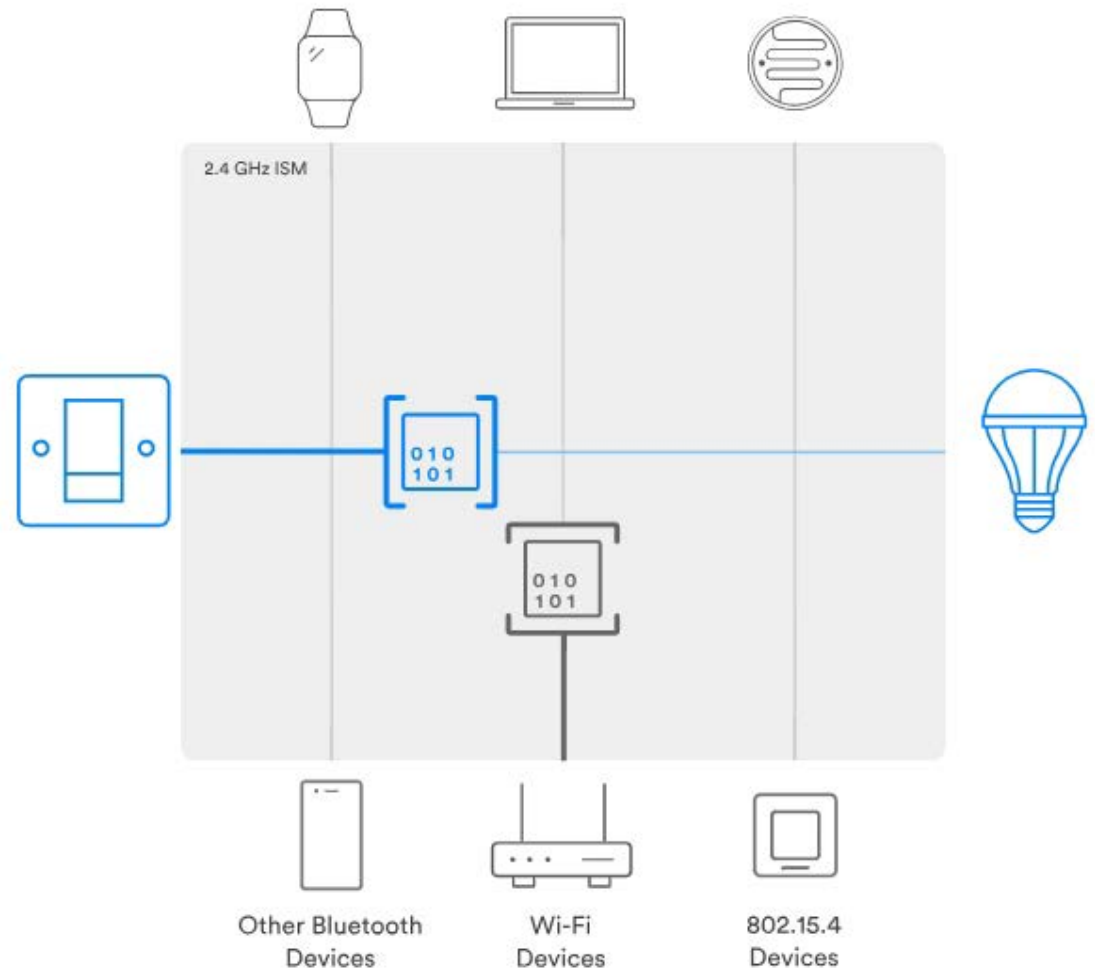
Is Bluetooth turned on?

Are streaming permissions enabled?

Are other Bluetooth enabled devices in the room and turned on?



Interference



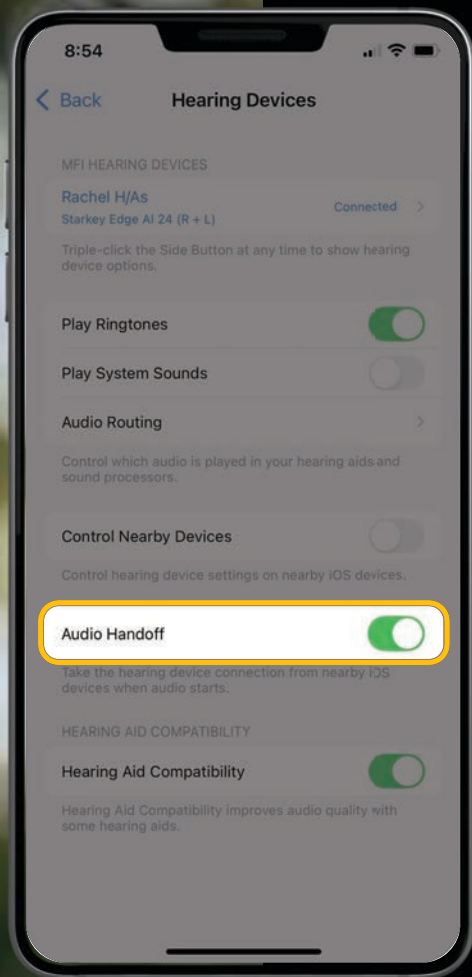


“ I live in a home with multiple devices on the same iCloud account and same WiFi. I am noticing some intermittency issues. What can be done to fix this?



Try this:

- ① Individual iCloud accounts for each person within a household
- ② Disable Bluetooth on devices that are not being actively used at the time
- ③ Disable Audio Handoff feature



Apple Only Disable Handoff

If patient/household members have other iOS devices*

Turn off "Audio Handoff"

Settings > Accessibility > Hearing Devices > Audio Handoff

Problematic if they are sharing the same Apple ID

Keep Bluetooth off on other iOS devices when not using them

**Hearing Aids can only be connected to one device at a time*



“ I go for a walk every day and put my phone in my back pocket so I can stream music. But I notice the music cuts out sometimes. Why is that?



Try this:

The 2.4 GHz signal is easily absorbed by the body, interfering with the signal transmission

Move the phone to front pocket, carry it in your hand, or wear an exercise phone holder on your arm



“ When taking phone calls outside the signal quality is choppy or weak.
Why does this happen?



Try this:

Bluetooth performs better with surfaces for the signal to reflect off

Move indoors for a more stable streaming signal



“ My phone operating system updated overnight and now I can't control my hearing aids from my phone. What do I do?



Try this:

- ① Forget the devices and re-pair them to the phone
- ② Restart the hearing aids
- ③ Restart the smartphone device
Recommend rebooting the hearing aid first



Reconnecting with Apple Devices

- ① Settings > Accessibility > Hearing Devices
- ② Select Hearing Devices
- ③ Tap “Forget this device”
- ④ Settings > Bluetooth > Turn off Bluetooth
- ⑤ Turn phone off and on again
- ⑥ Turn Bluetooth back on
- ⑦ Reboot hearing aids
- ⑧ Re-pair through Settings > Accessibility > Hearing Devices



“ How often should I reboot my cell phone to ensure proper functionality?



The National Security Agency (NSA) recommends powering your device off completely once a week*

*NSA Document: <https://s3.documentcloud.org/documents/21018353/nsa-mobile-device-best-practices.pdf>



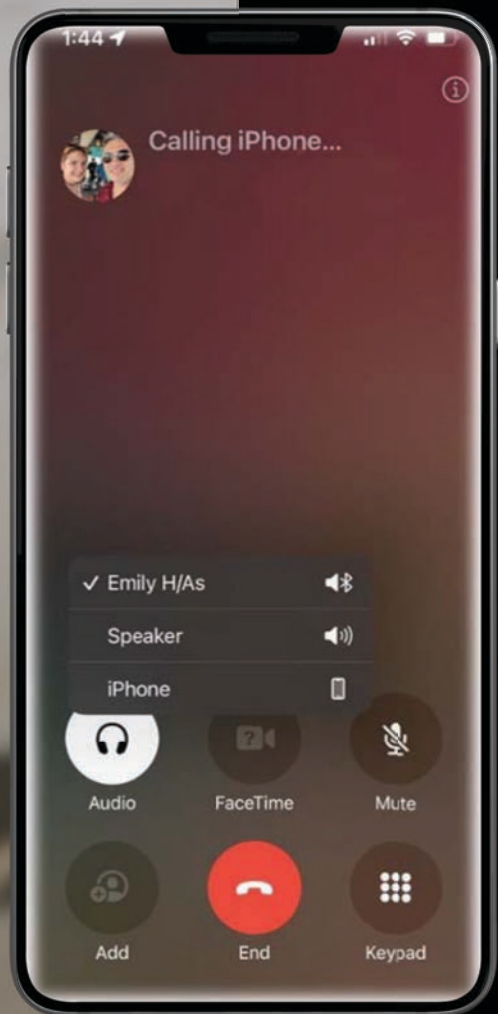
“ I am talking to my grandchild and want to pass the phone to my wife, but I don't want to turn off my hearing aids

What should I do?



Try this:

Check Audio Routing settings



Apple Devices Audio Routing

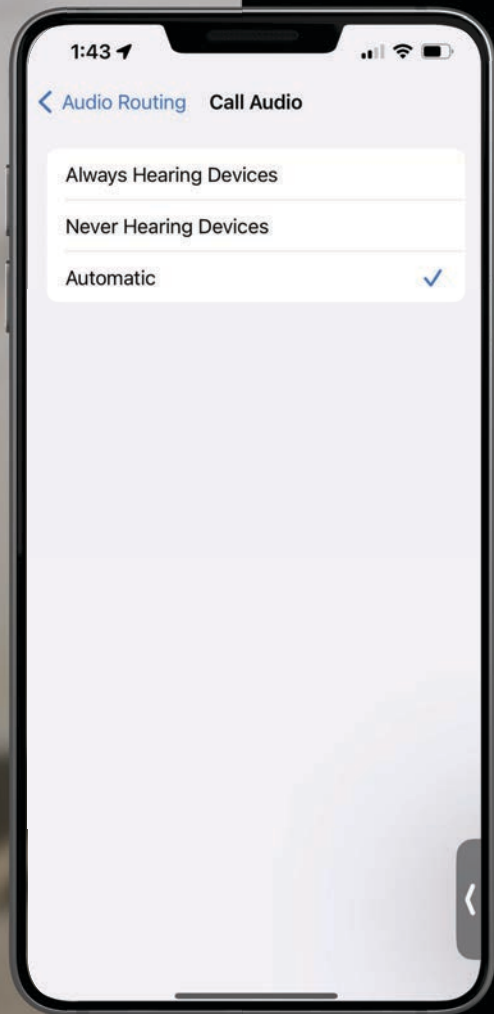
When in a call: click Audio

Select Routing option:

Hearing Aids

Speaker

iPhone



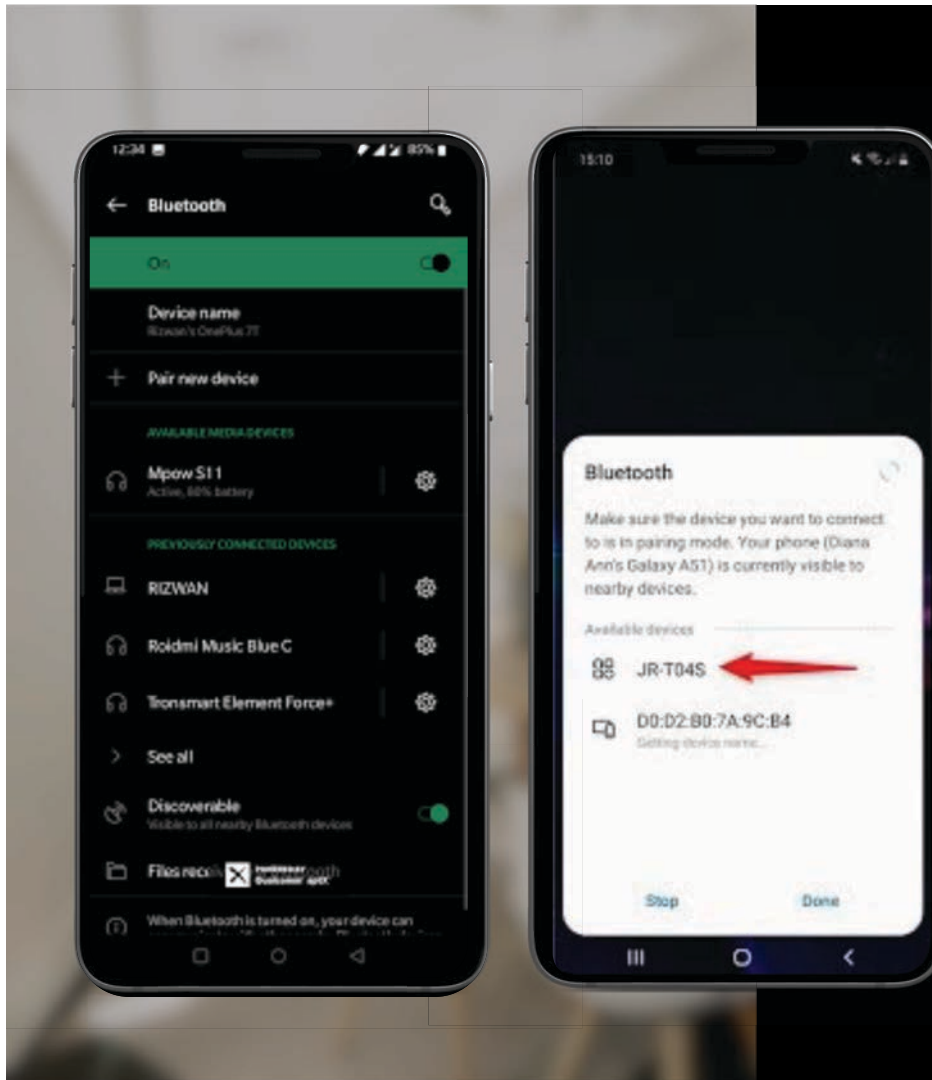
Apple Devices Audio Routing

**Settings > Accessibility > Hearing
Devices > Audio Routing**

Personalize for:

Call Audio

Media Audio



Android Devices Audio Routing

**Settings > Bluetooth > Gear Icon >
Use for > Call Audio or Media Audio**

Personalize for:
All streaming audio

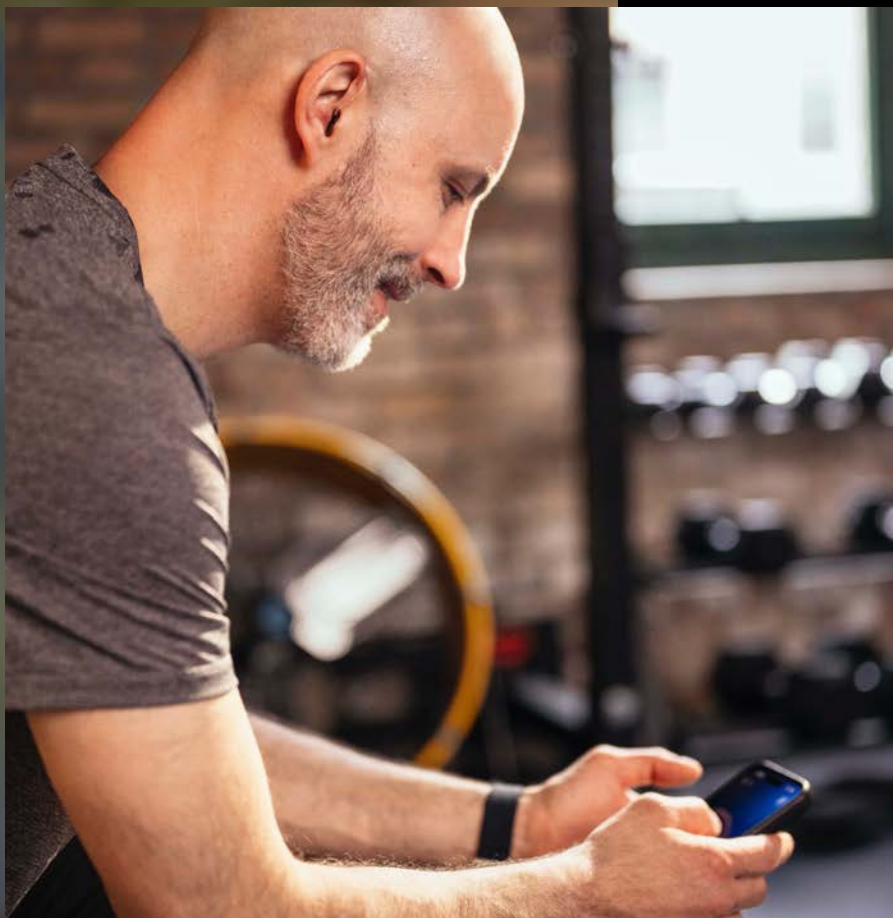


“ Only one of my hearing
aids is streaming
What should I do?

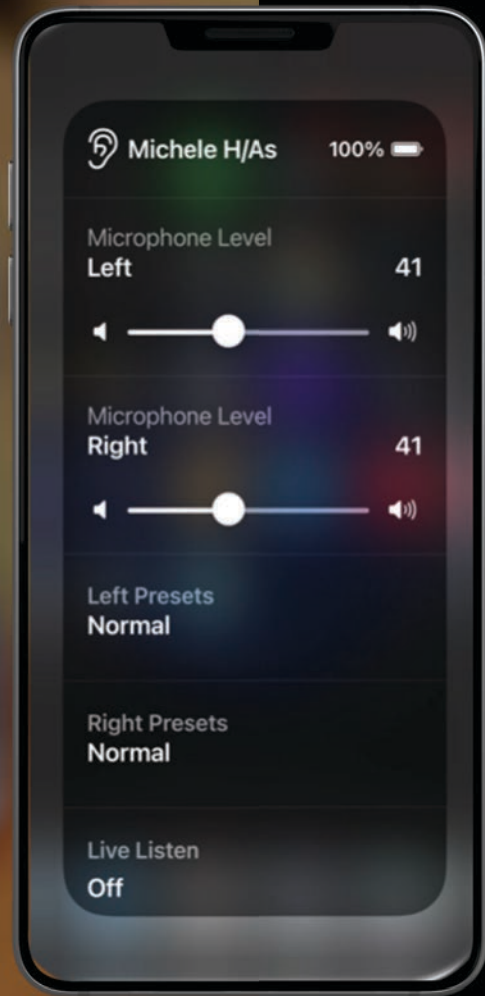


Try these steps in the following order:

- ① Close the streaming app completely
- ② Power off hearing aids
- ③ Unpair/forget hearing aids from the smart device
- ④ Shut down/reboot smart device
- ⑤ Wait a few seconds, select hearing aids on the screen to pair
- ⑥ Re-pair one hearing aid AT A TIME



“ I don't want to use another app
Can I still control the hearing aids
just from my phone?



Try this:

iPhone native controls:

New phones triple click on lock button

Older phones triple click home button

Try a StarLink Remote 2.0



“ When I type on my phone,
I hear the keyboard clicks
through my hearing aids
This is annoying
What can I do to stop this
from happening?



Try this:

Disable System Sounds

Best Practices and Tips





Phone Best Practices

Avoid extreme temperatures

Delete unused apps

Keep software and applications up to date



App Best Practices

Force closing apps limits the app and feature effectiveness and will slow down or hinder phone and app performance

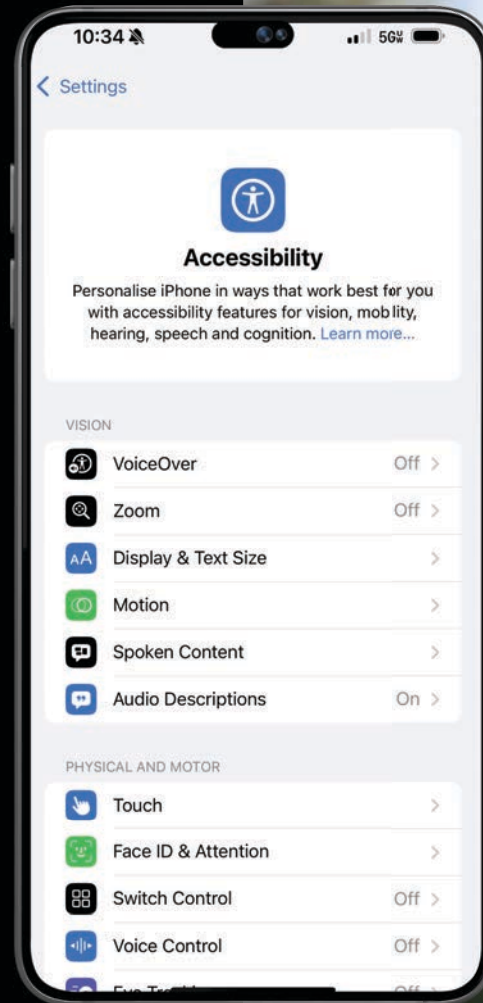
Apps “running” in the background are in a suspended state and will not affect phone battery life

Apple Senior-Friendly Tips

Enable Assistive Access

Optimize the display for visual
acuity issues

Keep the home screen simple



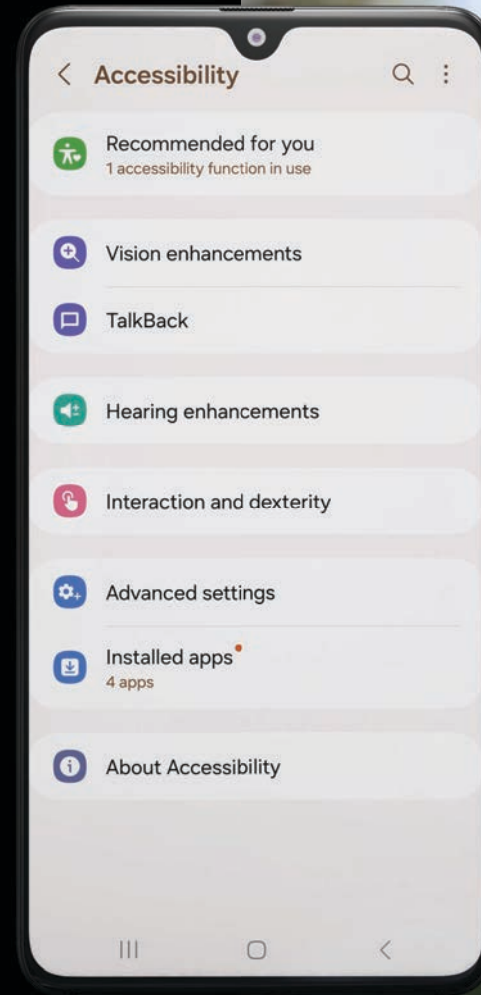
Android Senior-Friendly Tips

Senior Friendly Android Launchers

Increase keyboard key size and
increase text

Disable Gesture Navigation

Enable Easy Mode



What's next?



Future-proof connectivity

2.4 GHz Radio with LE Audio



Auracast™



Transmitters

Televisions

Smartphones

Tablets

Laptops

Public address system



Receivers

Hearing aids

Bone anchored hearing systems

Cochlear implants

Earbuds

Headphones



**Making
connectivity
*a constant***

Thank you

