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How to Win the Battle for Better Hearing in Noise

Tammara Stender, Au.D.

Director, Global Audiology External Relations

GN Hearing

Learning Outcomes

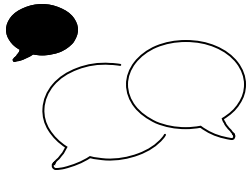
1) Discuss the need to focus on hearing in noise for the best possible outcomes for individual patients.

2) Detail how ReSound directional technology is empowers hearing aid users to battle the number one problem our patients face: better hearing in real-world noisy environments.

3) Explain how new wireless accessories and connectivity solutions can promote more inclusive listening experiences in some of the most difficult listening situations.



Hearing well in noise is the biggest challenge we face



Hearing conversations in noise is the #1 reason for purchasing hearing aids¹



Hearing in noise is the #1 driver of hearing aid satisfaction²

1. Manchaiah and colleagues, 2021

2. Picou, 2020

The biggest innovation challenges the industry faces in the future are **hearing in noise**, complexity leading to consumer inability to utilize the technology, and connectivity.

Every Day Feels Like This...



Next-era hearing

Made for Auracast™.
Top-rated for hearing in noise.
Available in all styles. And...



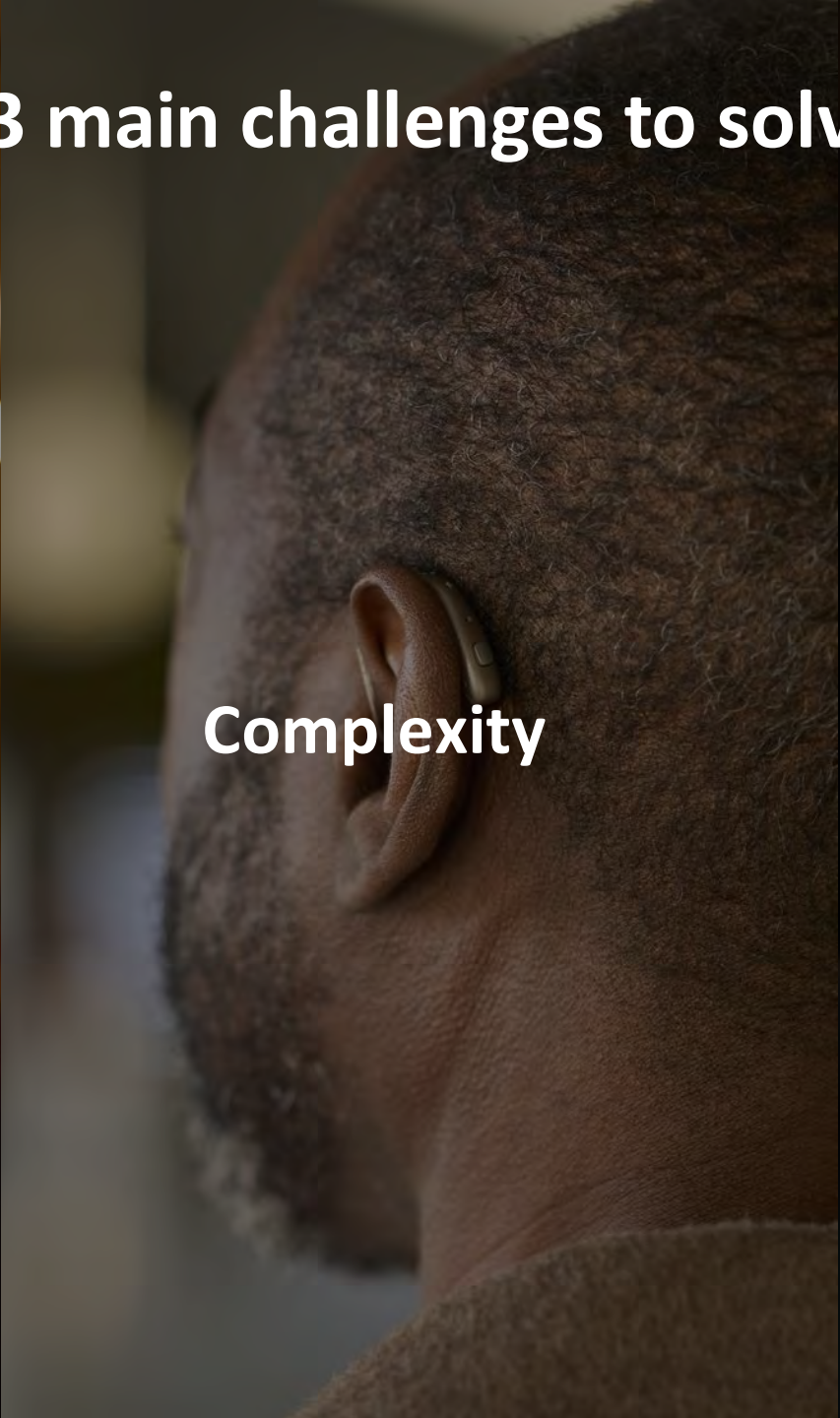
ReSound Nexia

The 3 main challenges to solve

ReSound GN

A middle-aged man with grey hair and a beard, wearing a maroon blazer over a blue button-down shirt, is smiling. He is in a crowded restaurant with blurred lights and people in the background, illustrating the challenge of hearing in noise.

Hearing in noise

A close-up profile view of a person's ear wearing a small, beige, behind-the-ear hearing aid. The background is blurred, focusing attention on the device and the ear.

Complexity

A hand holding a smartphone displaying the ReSound GN app interface. The screen shows a 'Restaurant' scene with three filter buttons: 'Noise filter', 'Speech focus', and 'Hear everyone'. A 'Sound Enhancer' slider is visible at the bottom. The background is a blurred restaurant setting.

Connectivity

Organic Hearing™

Sounds natural

Emulating the natural hearing process and the natural ways we listen as closely as possible, helping the brain to hear as nature intended.

Feels natural

Adapts organically to your clients for best wearing comfort all day long and ease of use

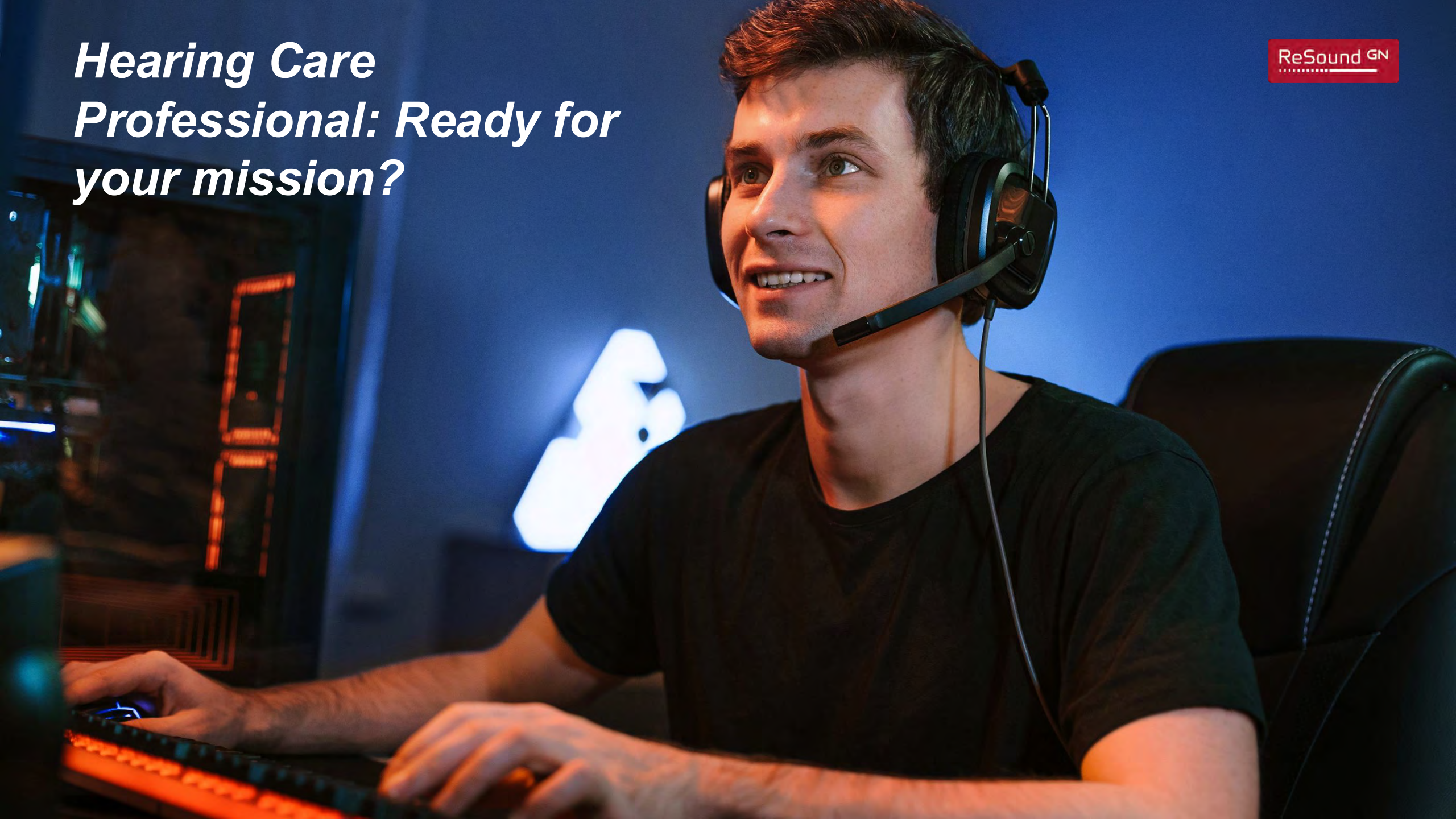
Connects naturally

Inspired by the way we intuitively interact with people and devices in our daily lives

ReSound GN

*Hearing Care
Professional: Ready for
your mission?*

ReSound GN

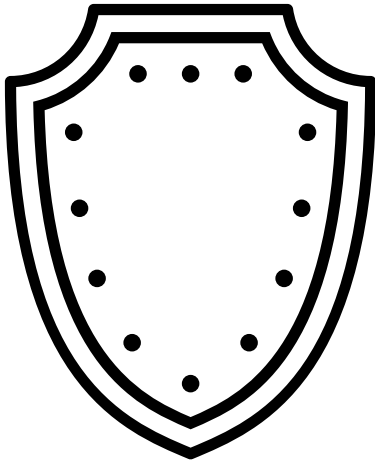


YOU are **Player 1!**

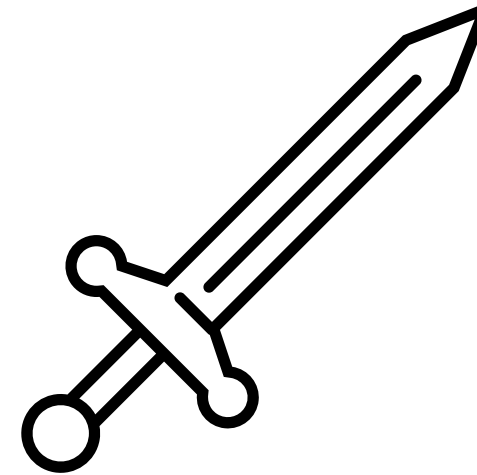
With our **knowledge** and **understanding** of how to use the **tools available** to us, we are uniquely suited to WIN the Battle for Better Hearing in Noise.

To Win the Battle, You Will Need:

Hearing instruments that are versatile, powerful and attractive enough to accomplish the goals of your patient



Technology to meet the patient's needs, either as features within the hearing instrument or through connectivity to external accessories and phones



To Win the Battle, You Will Need:

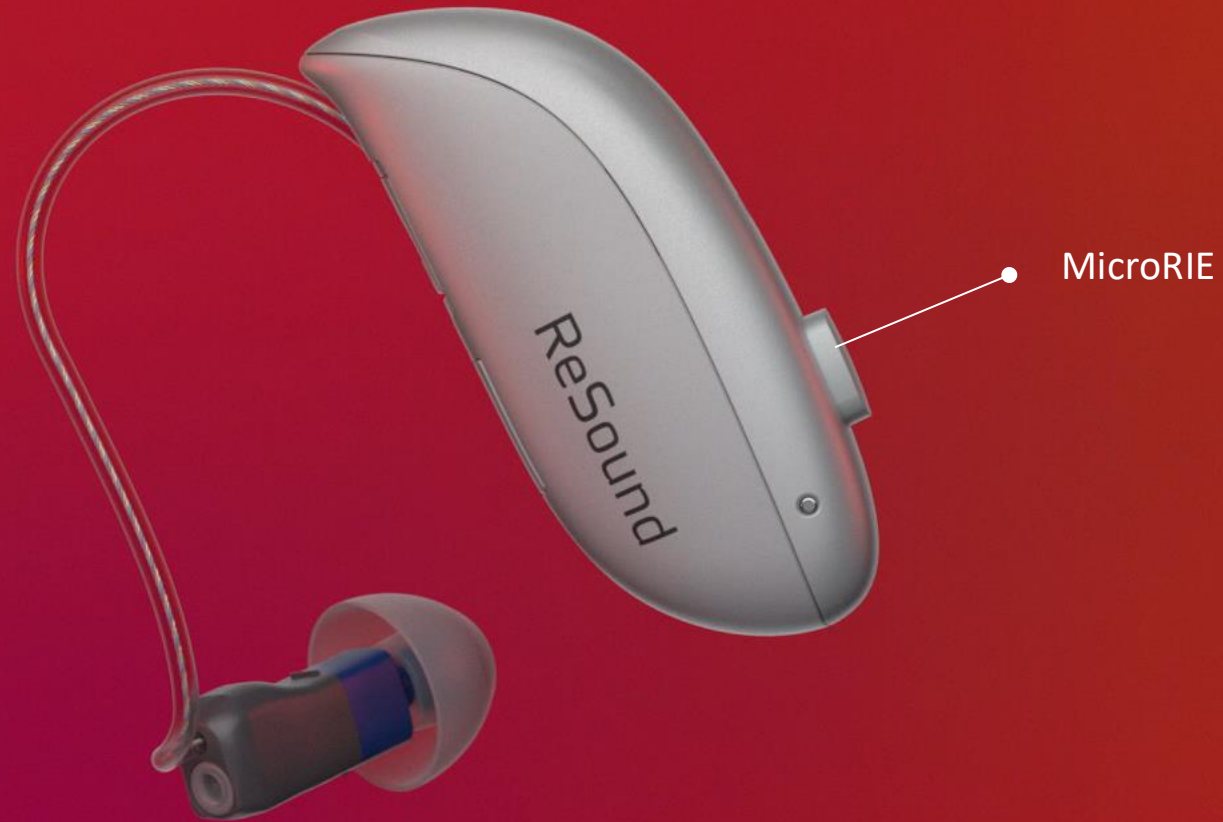
Hearing instruments that are versatile, powerful and attractive enough to accomplish the goals of your patient

ReSound GN





ReSound Nexia™



Industry's smallest rechargeable RIE



Smaller than ever and...



... it just keeps getting better



For mild-to-severe HL

- TapControl to answer phone calls*
- Wireless CROS/BiCROS
- Made for next generation of Bluetooth LE Audio and Auracast



ReSound Nexia microRIE

All-day power without compromises

ReSound GN



24 hr

Use time on one charge,
with three more charges in
the premium case



20 hr

When streaming audio 50% of the
time

Ultra fast
charging

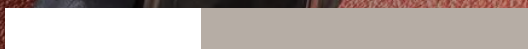
Charge time

3 hr



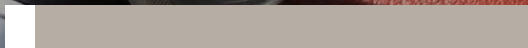
24 hr (max)

1 hr



8 hr (business-day)

10 min



1.5 hr

Charger overview





More styles, new accessories

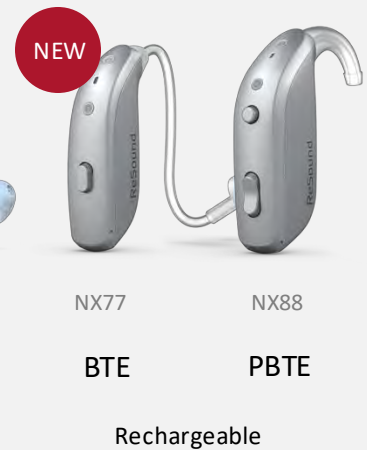
Customs



RIE



BTE



In price points 9, 7 and 5



ReSound Nexia RIE CROS

Industry's smallest CROS with low transmission noise

ReSound GN



CX160S-DRWC



works with RIE models

ReSound Nexia BTE CROS

New CROS BTE to fit more hearing needs



CX177-DWC



works with rechargeable customs and
BTE models



16h

Battery life when
streaming audio to
the opposite ear

GN proprietary data on file

To Win the Battle, You Will Need:

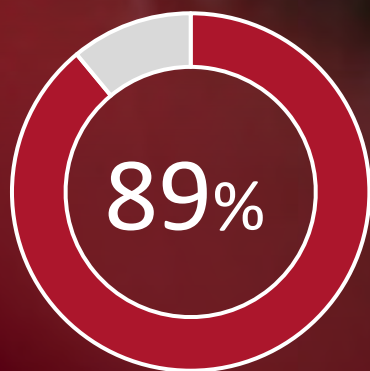
ReSound GN

Technology to meet the patient's needs,
either as features within the hearing
instrument or through connectivity to
external accessories and phones



Sounds natural

Recommended for hearing in noise



Users recommend
ReSound Nexia
technology for hearing
in noise*

Users' feedback**

Very natural. Front Focus is a game changer in environments with a lot of background noise.

After just one full day, they are game changers. Amazing is an understatement.

They really do help greatly with sound localization.

Sound is amazing. I forgot I had them in...

Breakfast and dinner were fantastic. In a circle of 4 with a lot of background noise, the speaker's voice was crisp and clear in the All-Around setting.

Own voice perception was THE BEST.

*Ratings from 1599 real users through the ReSound Smart 3D app

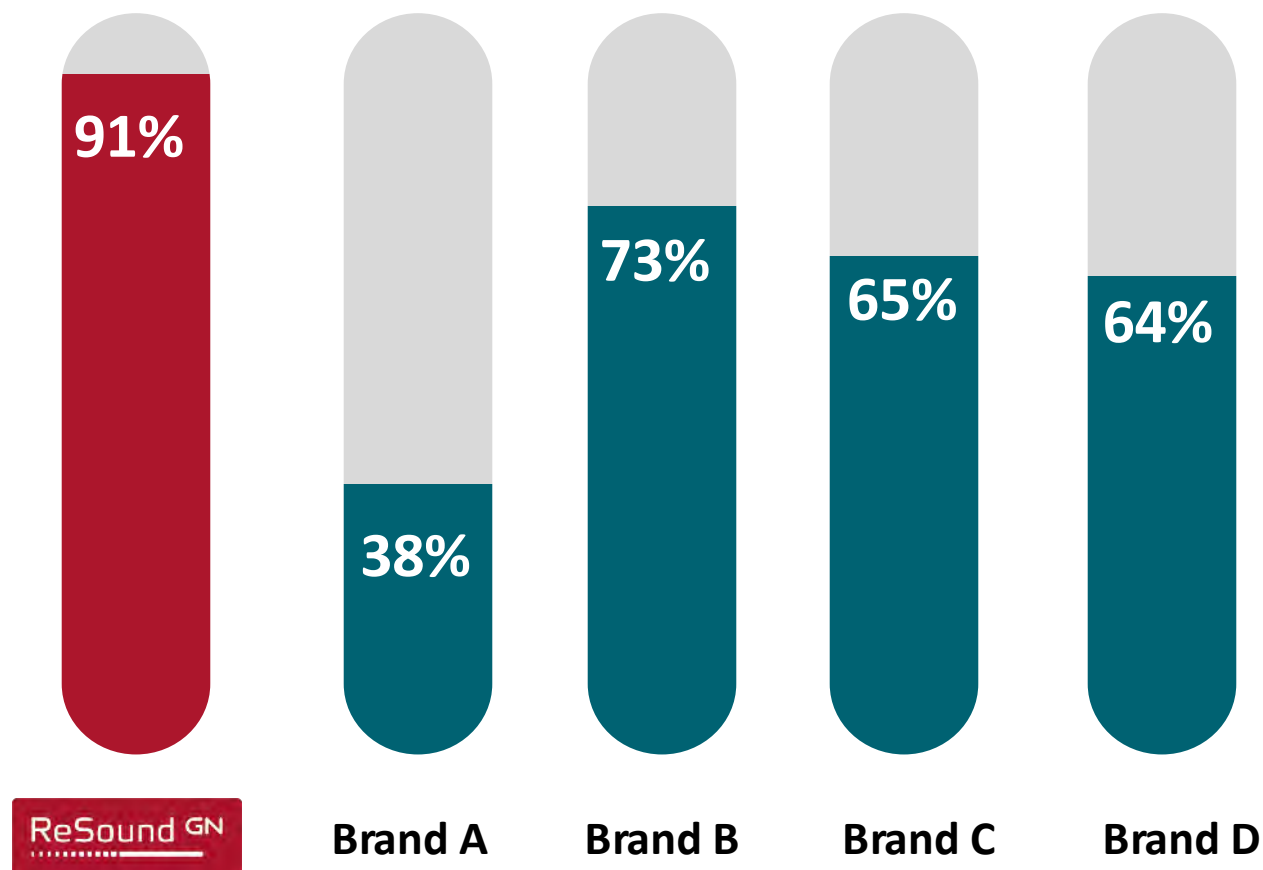
** End-user quotes from US & UK



Industry's most accurate environmental classifier*



Accuracy of speech
identification in noisy
environments



*Compared to other premium brands providing environmental classification data Groth et al., 2023)



360 All-Around

ReSound GN

Industry's best providing access to surrounding sound*



Wider sound environment mapping – for better spatial awareness around you



Faster detection, selection and adaption to environments – for better automatic feature activation

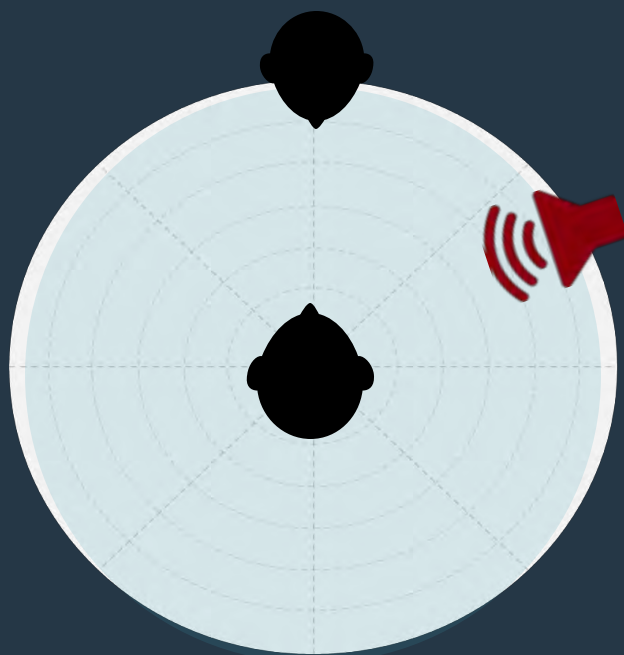


Narrower beamforming for best speech clarity for speaker in front of you – like in a grocery store checkout!

*Compared to other premium brands with 4-mic binaural beamforming (Groth et al., 2023)

An incredible improvement in speech understanding*

Omnidirectional



ReSound with
Ultra Focus



+4.25dB
better than omni

ReSound with
Front Focus

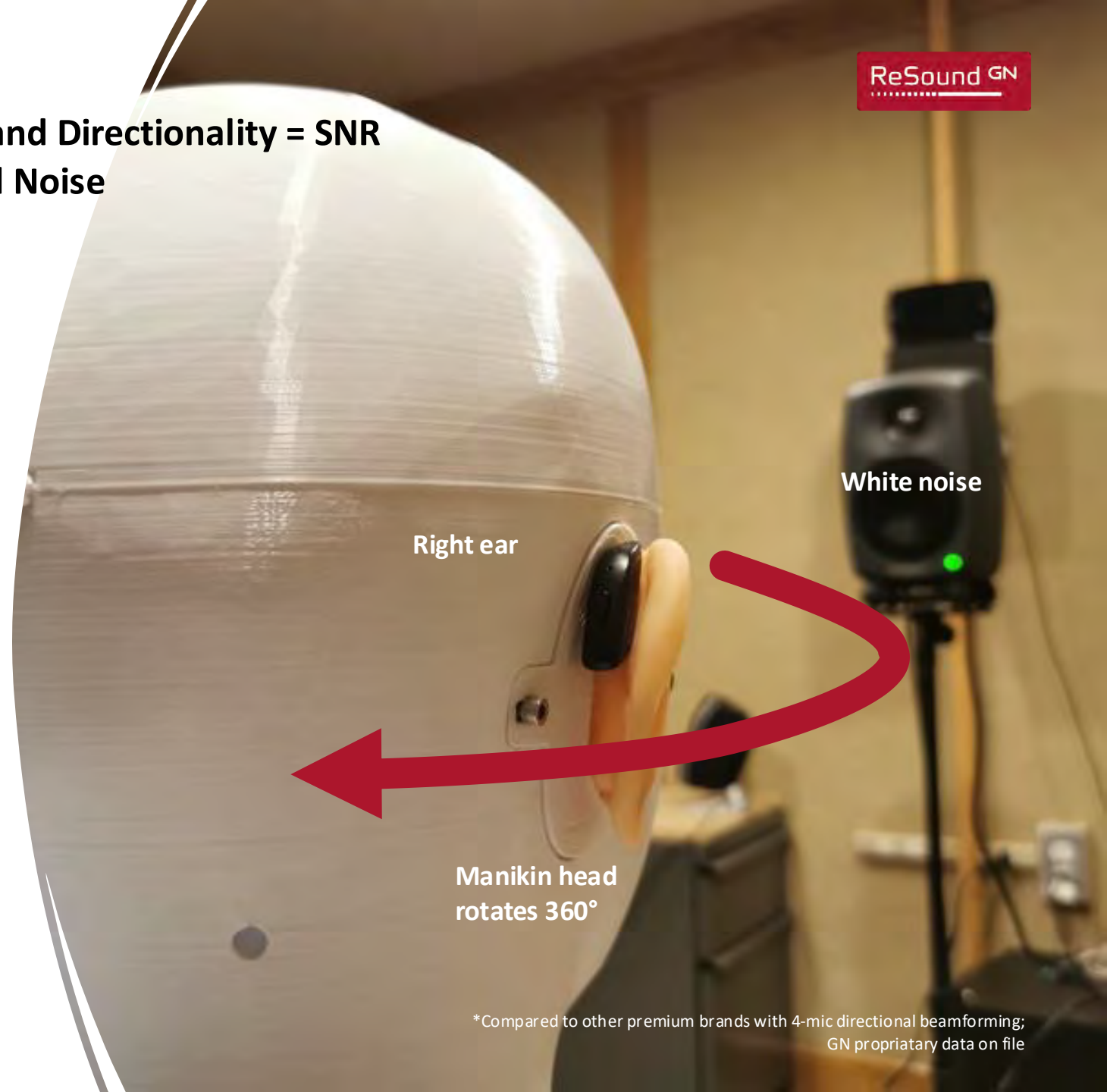
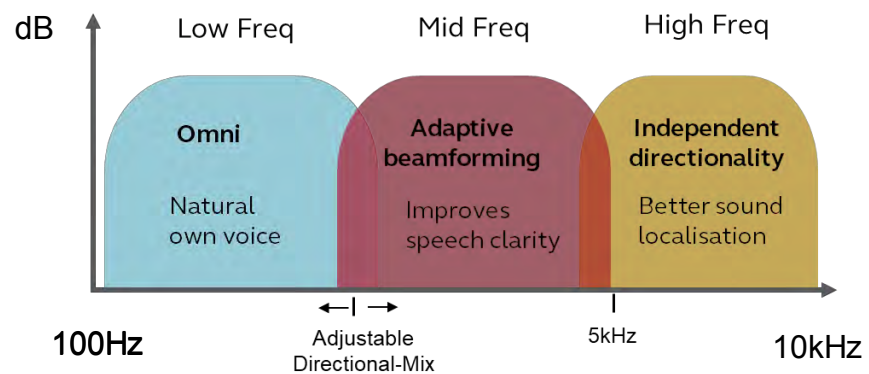
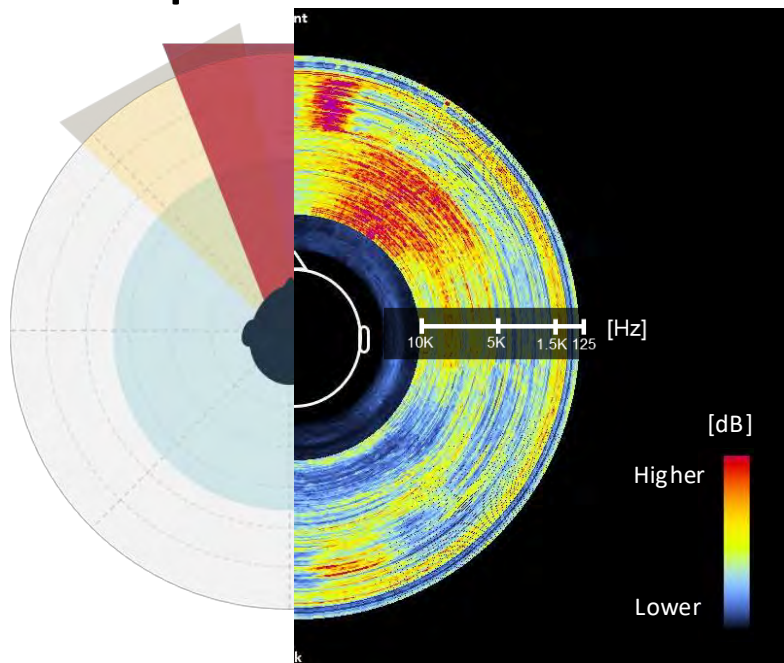


+8.61dB
better than omni

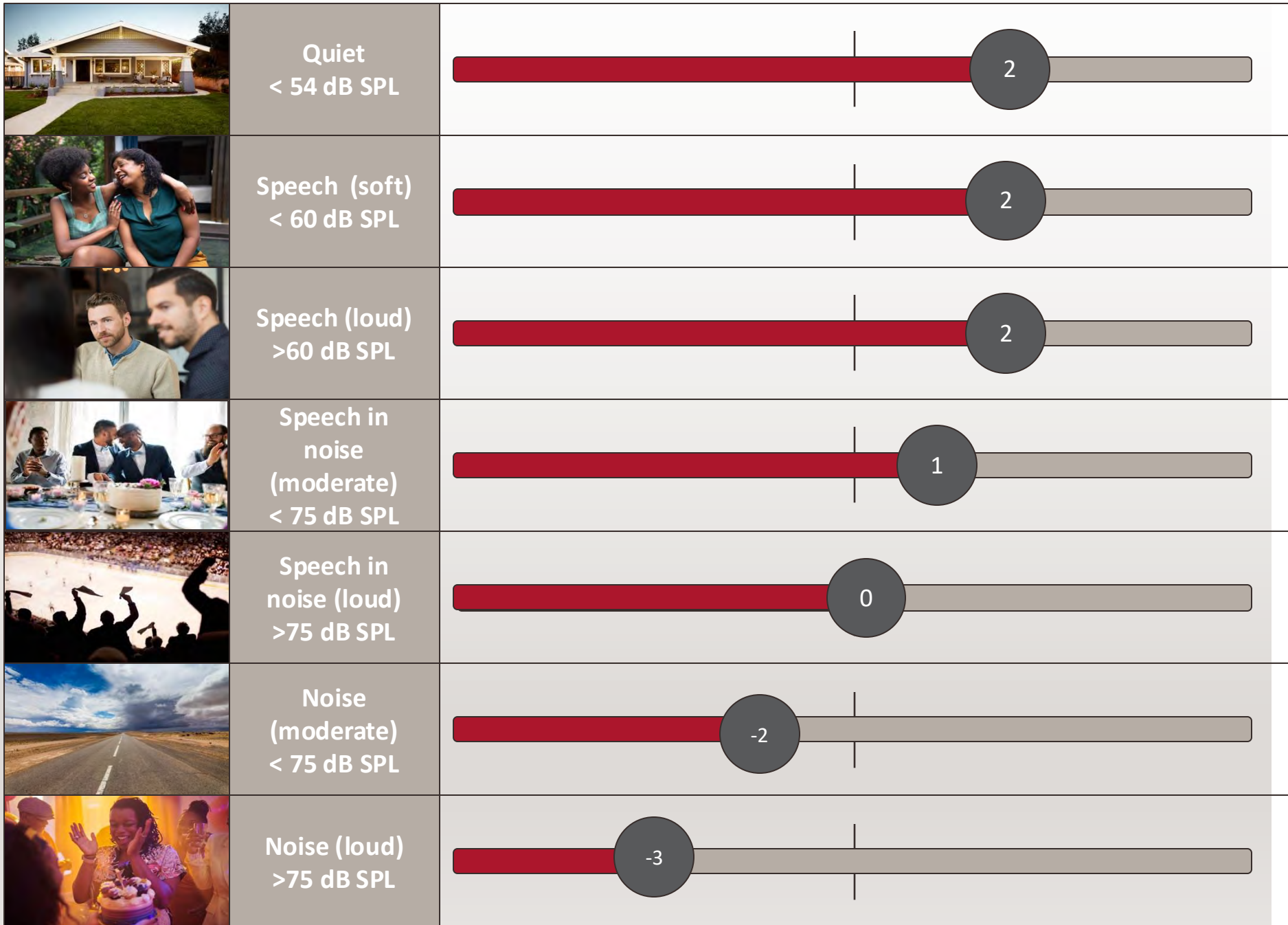
+4.5dB
better than Ultra Focus

*Jespersen & Groth (2022)

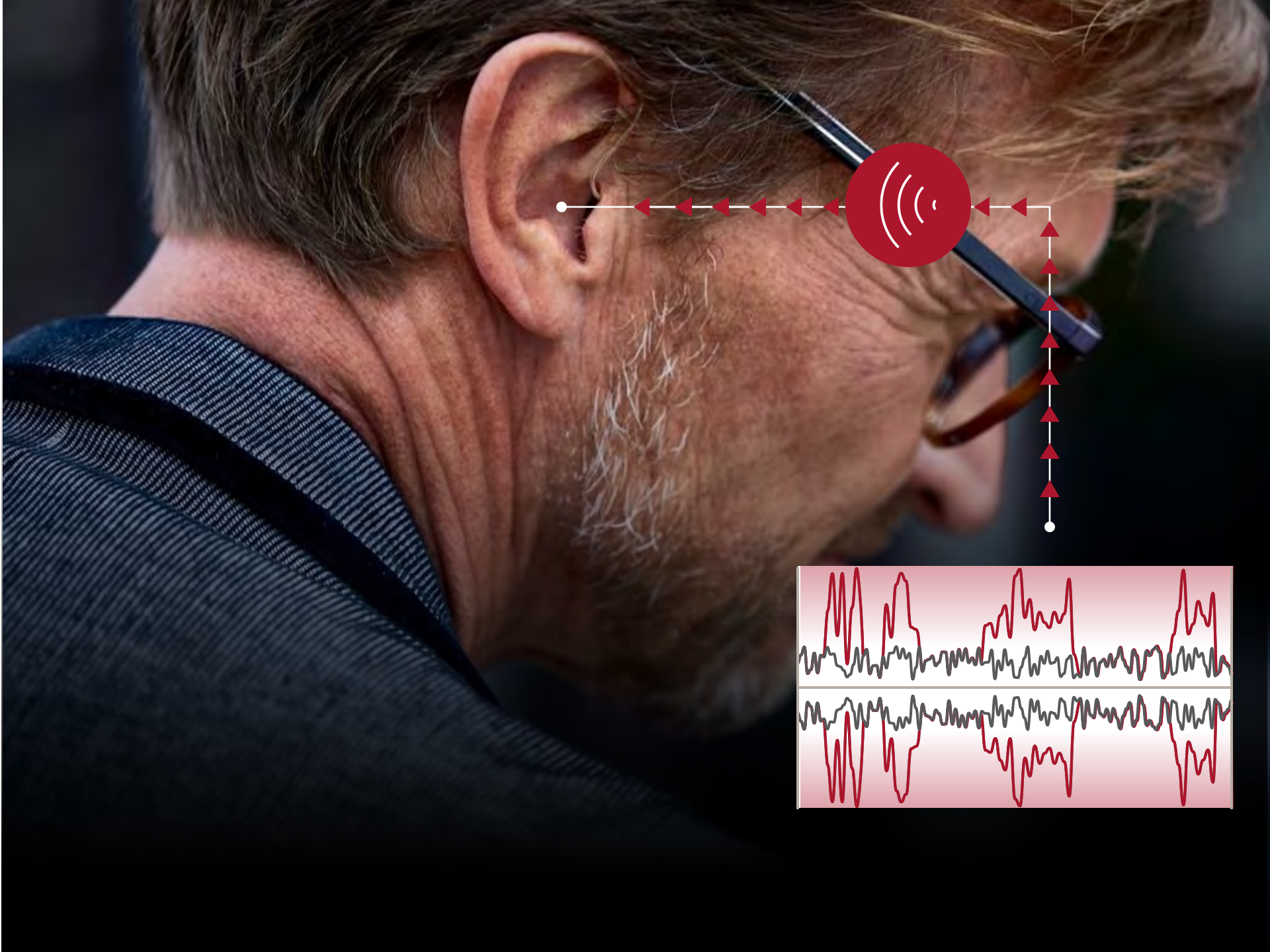
Industry's Narrowest Beamformer* + Multiband Directionality = SNR Benefit AND Spatial Awareness in Real-World Noise



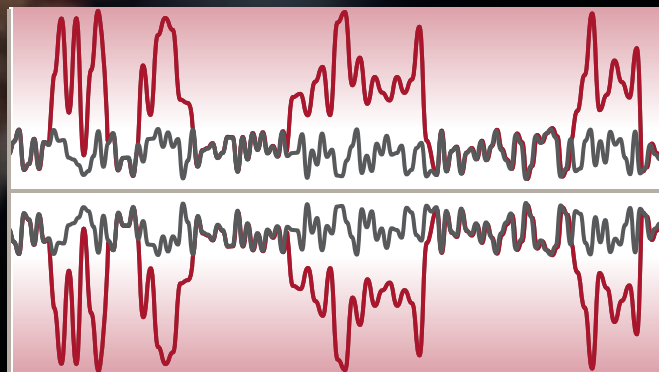
*Compared to other premium brands with 4-mic directional beamforming; GN proprietary data on file



Environmental Optimizer



Noise Tracker II

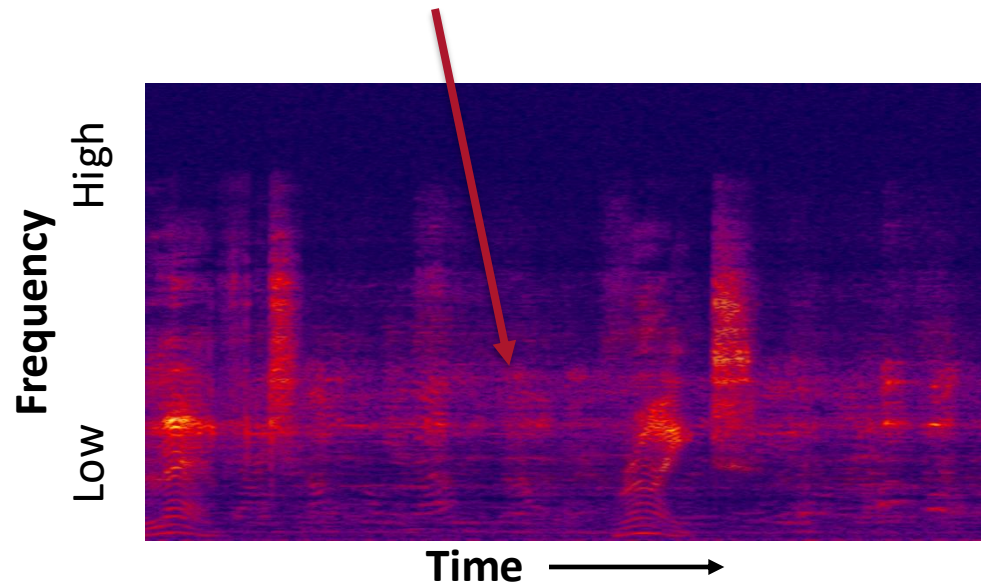


ReSound NoiseTracker II

Spectrograms of a speaker saying the words, “Left” and then, “Right” in a background of speech babble (cafeteria) noise.

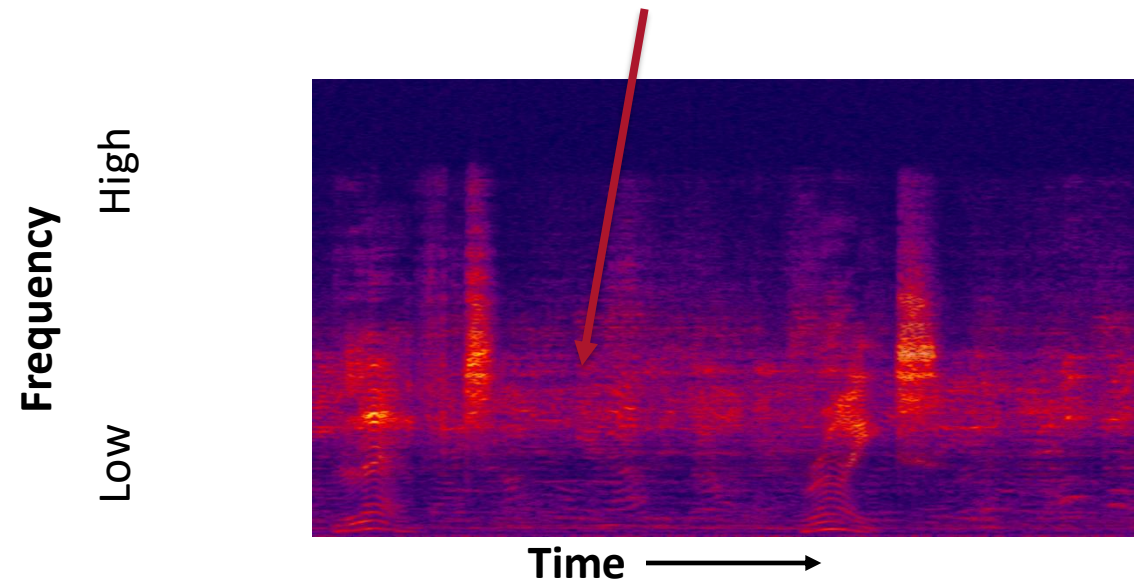
ReSound Nexia

Reduced babble noise

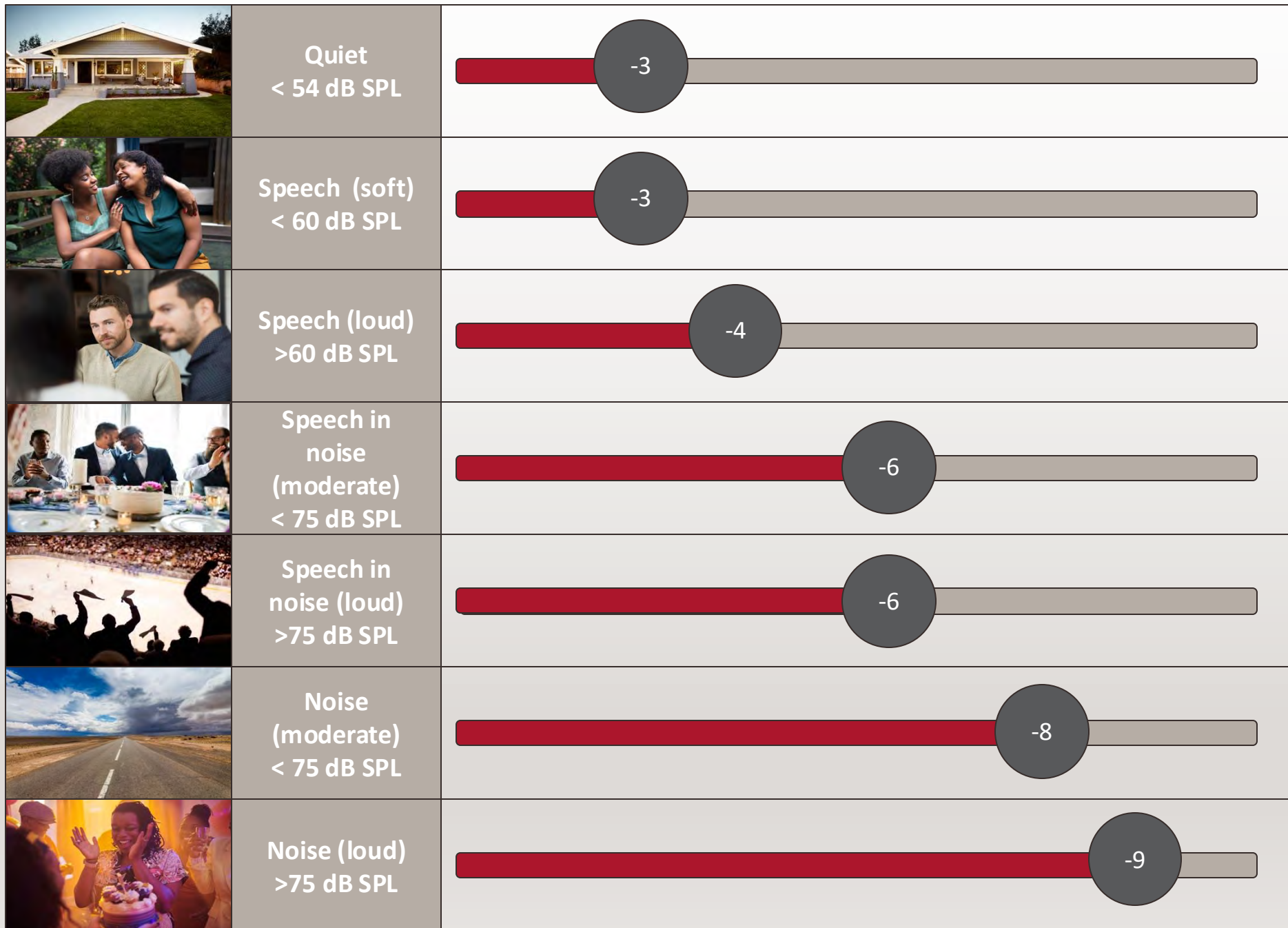


Alternative Product

Persistent babble noise



Better contrast between speech and noise in the ReSound spectrogram, especially in the mid-frequencies where noise is present.



Noise Tracker II



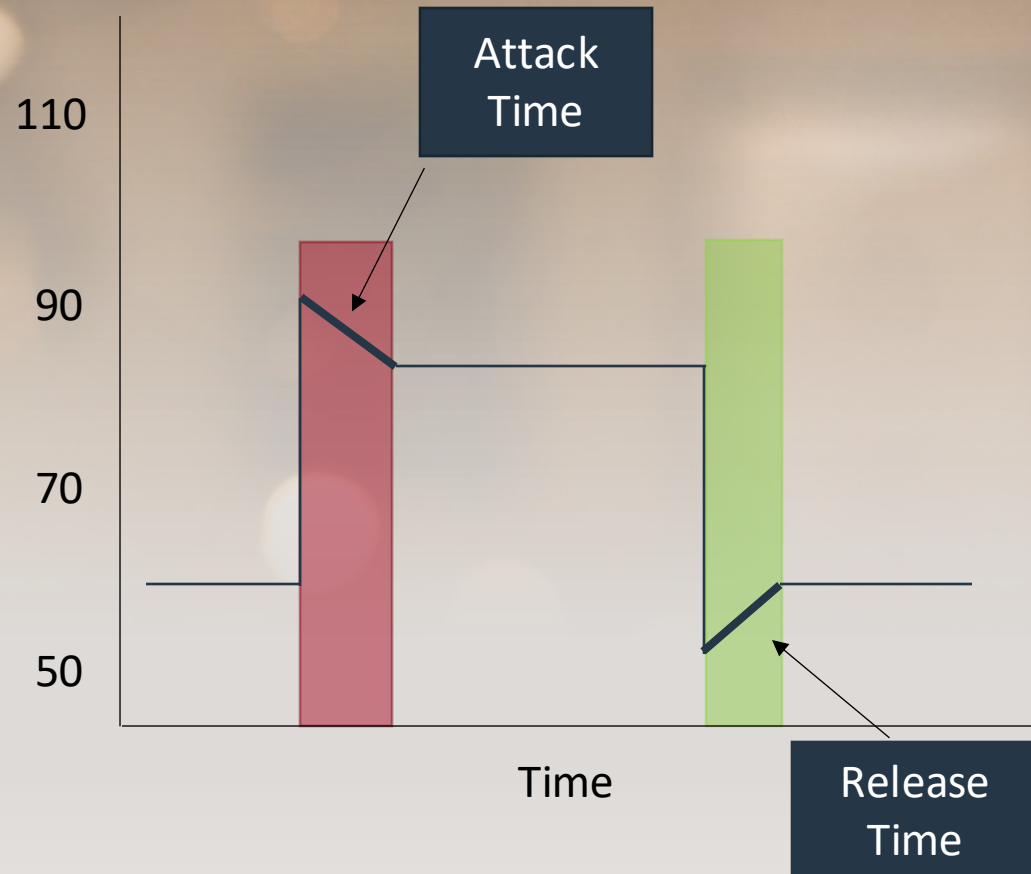
Time constants are the attack and release times of the compression system



Faster time constants prioritize **speech clarity** in noisy environments



Slower time constants prioritize **comfort**



Time Constants



Everything is better with M&RIE

Benefits confirmed by National Acoustic Laboratories (NAL)

ReSound GN

80%

Of listeners were better at localizing sound*

80%

Of listeners preferred M&RIE in background noise*

90%

Of listeners experienced less listening effort*

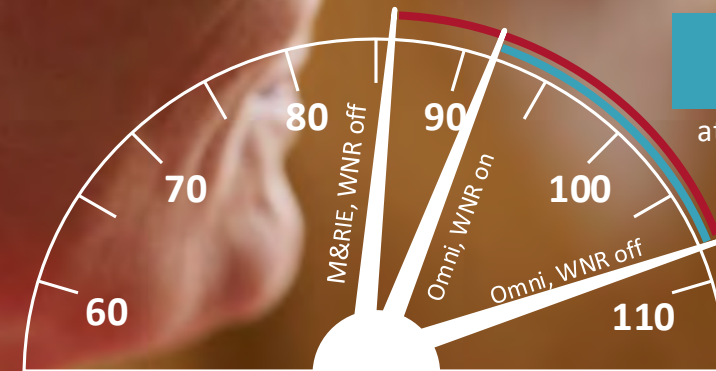
M&RIE reduces wind noise, naturally**

22dB

Natural wind noise reduction with M&RIE

16dB

attenuation



Wind noise level [dBA]

*National Acoustic Laboratories, Kitterick & Kwok (2023)

** Schumaker (2023); Newall et al. (2023)

ReSound Nexia

ReSound GN

Connects naturally

Made for Auracast,
the next era of universal
connectivity





A new era of communication has just started

ReSound GN

Did you know?

Bluetooth LE Audio is expected to be the preferred audio standard for wireless communication in electronic devices for the next 20 years

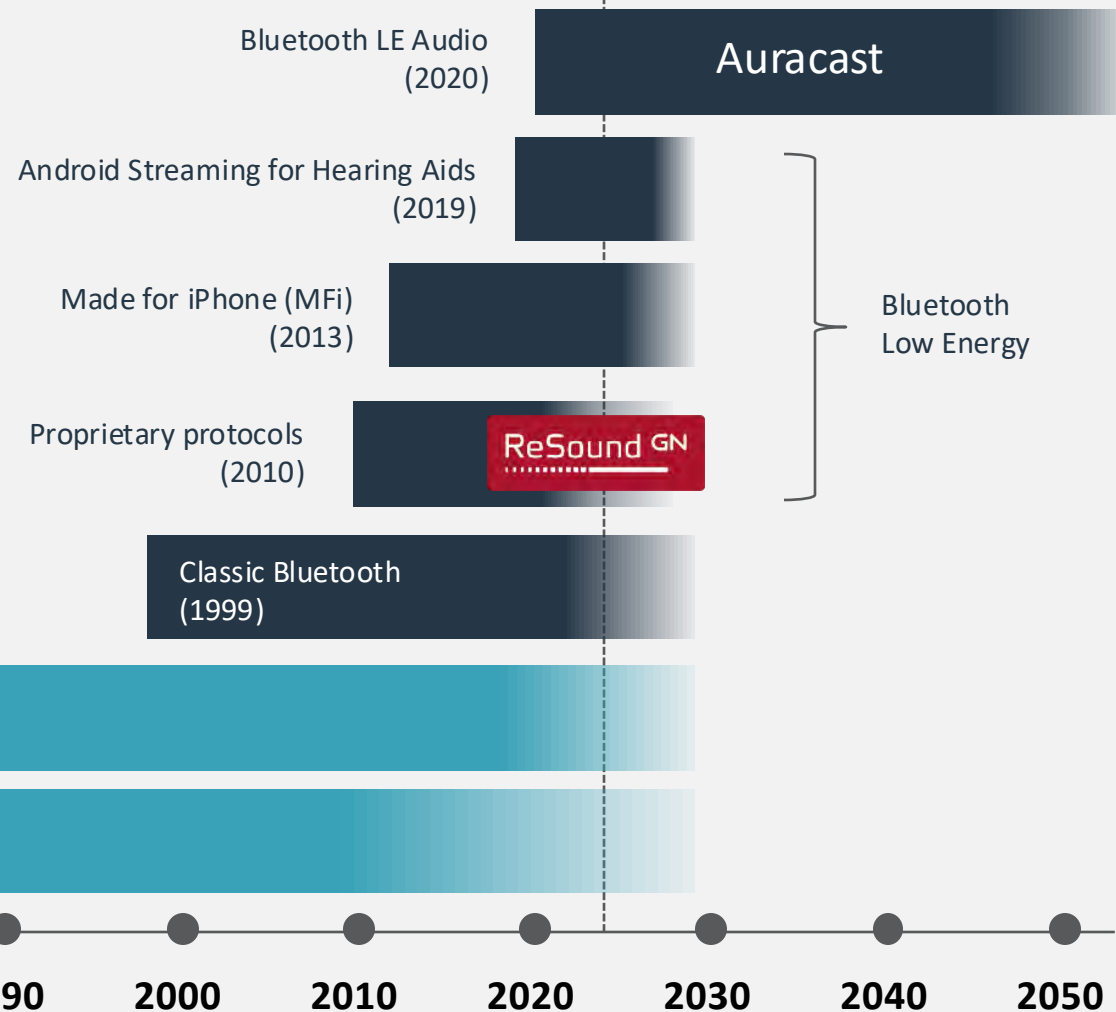
Bluetooth SIG

● Digital (2.4GHz)

● Analog

1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050

Today





Connect to anything, anywhere



Bluetooth LE Audio

3 BILLION

Bluetooth LE Audio
enabled devices will ship
annually by 2027

ABI Research, 2023

Bluetooth versions: what you should know

	Bluetooth Classic	Bluetooth Low Energy	
		MFi & Android streaming	Bluetooth LE Audio
 Pros	• Good sound quality • Widely used (more than 5 billion devices by 2021)	• Good sound quality • Low battery consumption • Low latency	• Enhanced sound quality • Low battery consumption • Low latency • Universal and future proof • Flexible, better for developers • Allows for new experiences and applications
 Cons	• Battery hungry, not ideal for hearing aids • High latency • Will be obsolete in future	• Not universal	• Emerging technology. Not yet broadly implemented



Benefits of Bluetooth LE Audio

ReSound GN



Higher sound quality,
lower power



Multi-stream

Connect to multiple devices
simultaneously

Two-way communication:
makes possible hands-free
calls in Android phones



 **AURACAST**

Broadcasting and audio
sharing

In personal electronic
devices and public places



NEW LC3 CODEC

**Higher sound quality,
lower power**

Preferred sound quality over
Classic Bluetooth even at
lower bit rates.

Bluetooth® Codec Comparison

Standard Stereo Listening Test

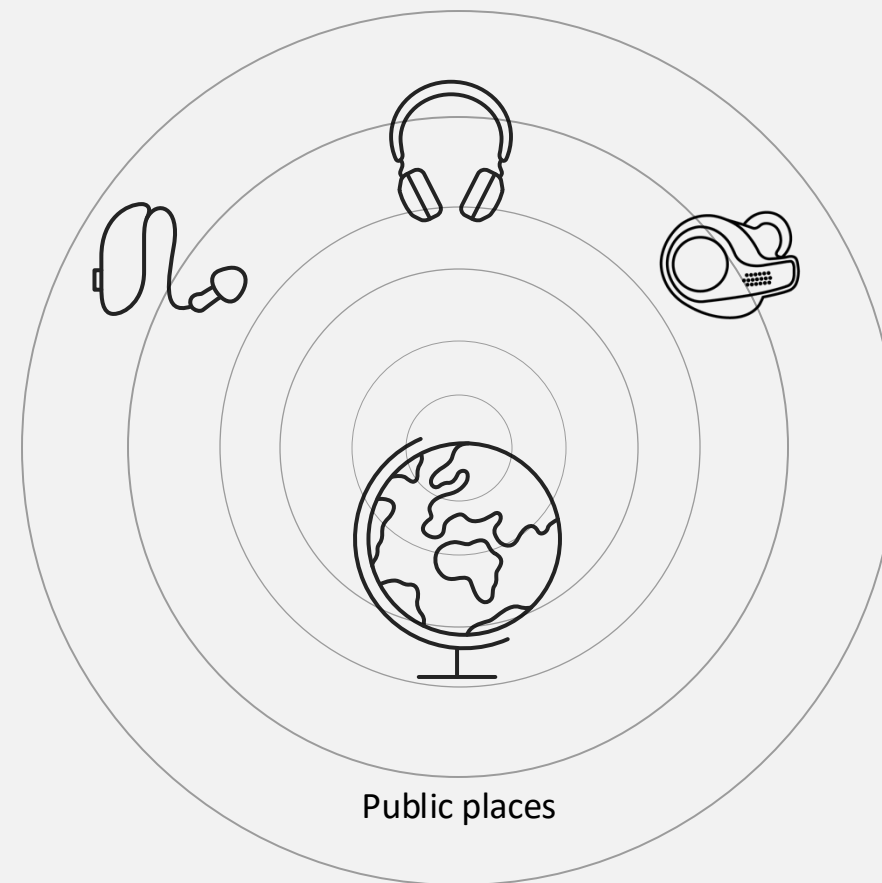
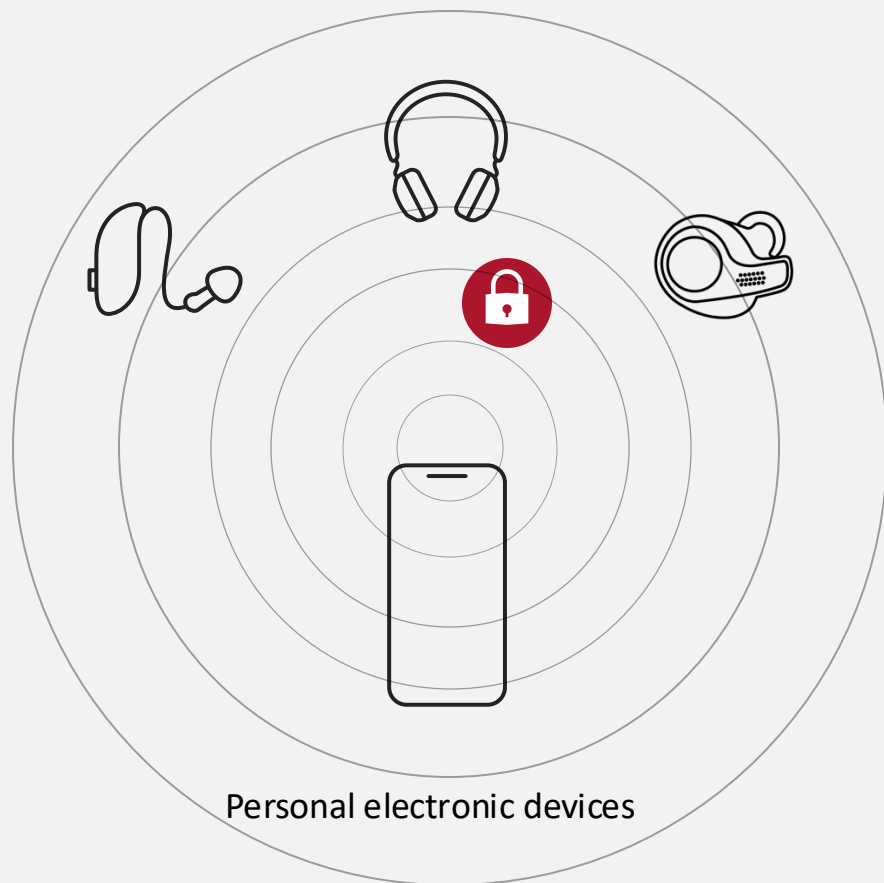


Source: FORCE Technology, SenseLab





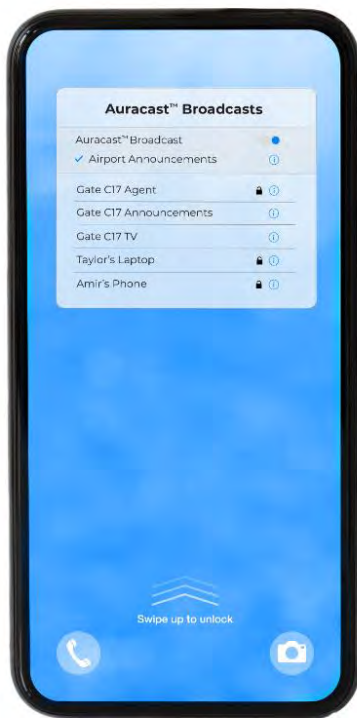
Where can I enjoy Auracast?



Auracast broadcast audio can be public for everyone, or private with a password



3 easy ways to join Auracast



1 With a smartphone, similar to connecting to WIFI

2 A simple scan of a QR code

3 Tapping a dedicated button



Auracast will make the world more hearing friendly and accessible for everyone



Share your audio

Shared listening and watching from your personal device



Unmute your world

Public TV watching



Hear your best

Public address and assistive listening



Ready for the future without compromises

ReSound GN



* With wireless accessory

** With wireless accessory or in selected models

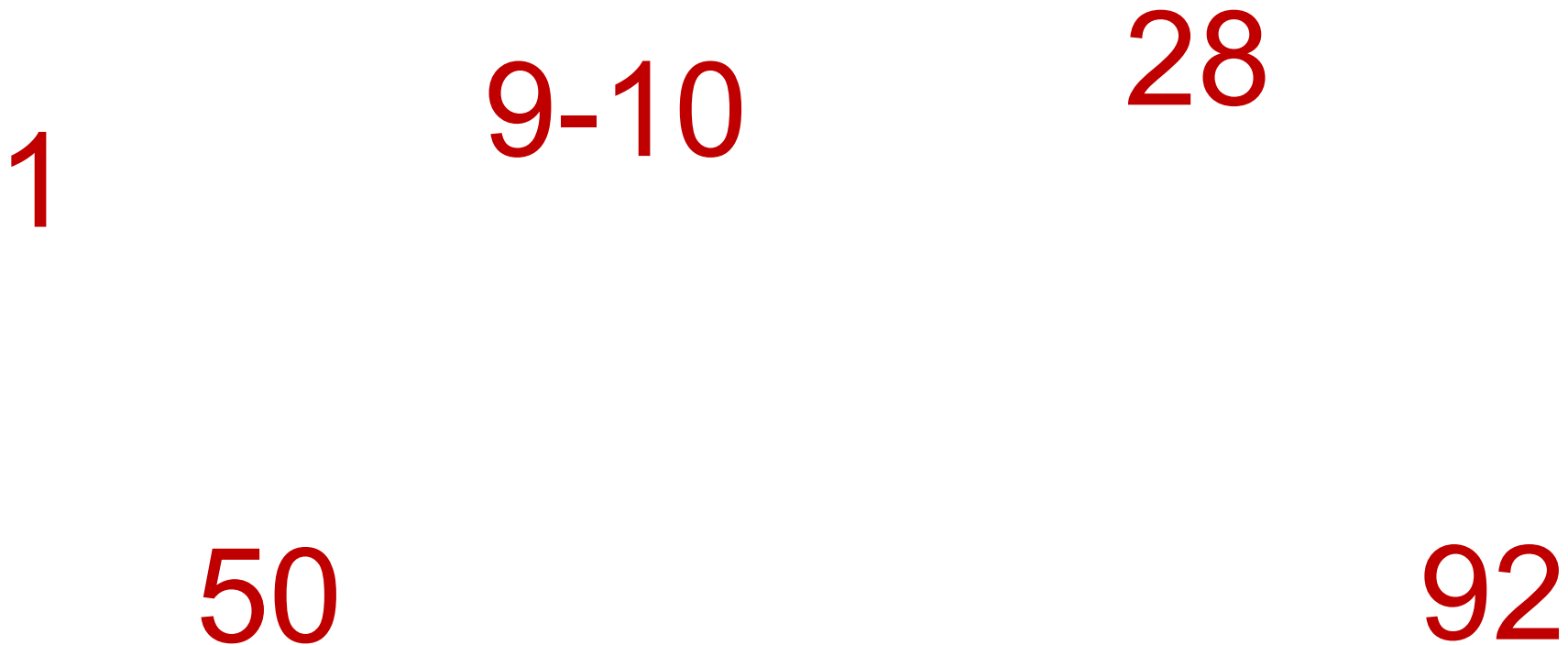
Connect naturally

A new era of wireless accessories with Auracast



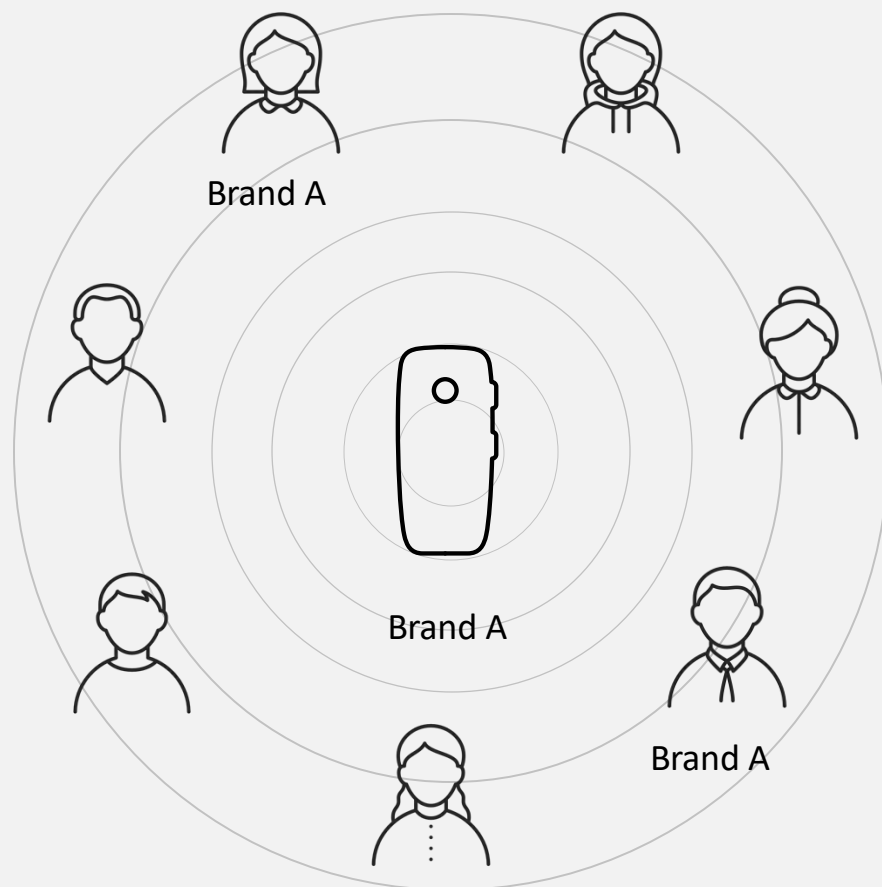
What percentage of hearing aid wearers use wireless accessories?

Write it in the chat!





Auracast will transform assistive listening devices



Traditional technology can only stream audio to hearing instruments of the same brand



Auracast will allow remote microphones to broadcast audio simultaneously to an unlimited number of nearby audio devices with Bluetooth LE Audio



Auracast will transform assistive listening devices



ReSound Smart 3D™ app

Select public broadcast (Auracast), or private from the app



Auracast will allow remote microphones to broadcast audio simultaneously to an unlimited number of nearby audio devices with Bluetooth LE Audio



Presenter mode

One-to-one/One-to-many when
placed vertically



Table mode

To hear group conversations
when placed horizontally



Pro Tip: Achieve greatest SNR benefit
for any remote microphone accessory
by deactivating HA mics while streaming



Mic mode

T-coil

Headphone mode

FM mode

Audio mode

Connect to audio devices in
private and public places



ReSound GN

New TV-Streamer+

Works with Auracast



Auracast (public)
Unlimited

How many people can listen to
the TV –Streamer+?

Encrypted (private)
1-10 devices

Did you know?

You can use the ReSound Smart 3D app to
select public broadcast with Auracast, or
private



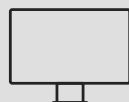


How many devices can be paired to ReSound Nexia?



Electronic devices

Via Bluetooth LE Audio, MFi and ASHA



Electronic devices

TV-Streamer+

Multi-Mic+

Up to 8 devices

TV Streamer/Multi-mic

Previous generation of wireless accessories



Up to 3 in total

Phone Clip

Connects to phones with Classic Bluetooth®



1 unit

Remote Control



1 unit

ReSound Nexia



Made for Auracast™.
Top-rated for hearing in noise.
Available in all styles. And...

Loading Player 1...

ReSound GN

...Your First Patient Awaits

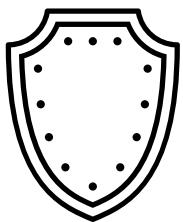
Let's Go!



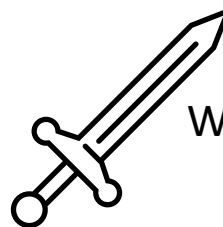
Write it in the chat!

Sam

- Age: 32
- Restaurant consultant
- Hearing aid experience: None
- He is having trouble hearing, especially in busy restaurants, Microsoft Teams meetings online, meetings in conferences rooms.
- He has normal hearing in the low frequencies, progressively sloping to a severe high frequency hearing loss.
- SNR loss of 5.5 dB



What hearing instrument style would you choose?



What features or accessories would you choose?

Loading Player 1...

ReSound GN

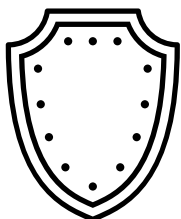
...Your Next Patient Is In the Lobby



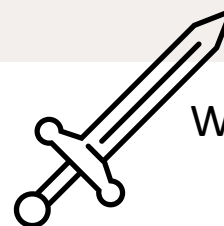
Peter

- Age: 54
- Retired pilot, active lifestyle, uses Samsung Galaxy S23
- Hearing aid experience: None
- Travels to hear bands, trouble understanding speech in bars. Difficulty understanding guides on tours. Wife says TV is too loud. Peter hopes new Bluetooth LE Audio TV will help.
- Like Sam, Peter has normal hearing in the low frequencies, progressively sloping to a severe high frequency hearing loss.
- **SNR loss of 9dB – although Peter has a similar hearing loss to Sam, he has more difficulty hearing in noise.**

Write it in the chat!



What hearing instrument style would you choose?



What features or accessories would you choose?

Loading Player 1...

ReSound GN

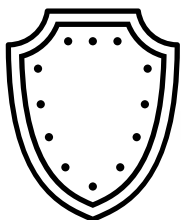
...Next Patient Ready to Go!



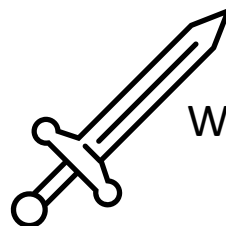
Greta

- Age: 57
- Social worker, long hearing aid history.
- Needs highest possible speech understanding at work.
- Increasing difficulty in crowded social gatherings.
- Struggles face-to-face, on phone, in meetings.
- Family says TV volume is high.
- **SNR loss of 16 dB**

Write it in the chat!



What hearing instrument style would you choose?



What features or accessories would you choose?

Every Day Feels Like This...Because You are the Hero!

ReSound GN



Thank you for all you do for the people who depend on you to win the battle for better hearing in noise! **GN** 57

Questions?

Thank you!



tstender@gnresound.com