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### On a Mac

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# M&RIE Best Practices

2021

# M&RIE

M&RIE MAKES SENSE

Our individual ear provides

- Our own unique acoustics
- Localization
- Spatialization





Receiver

Microphone

M&RIE  
Microphone & Receiver-In-Ear

M&RIE benefits

Testimonials

Research

Candidacy

Counseling

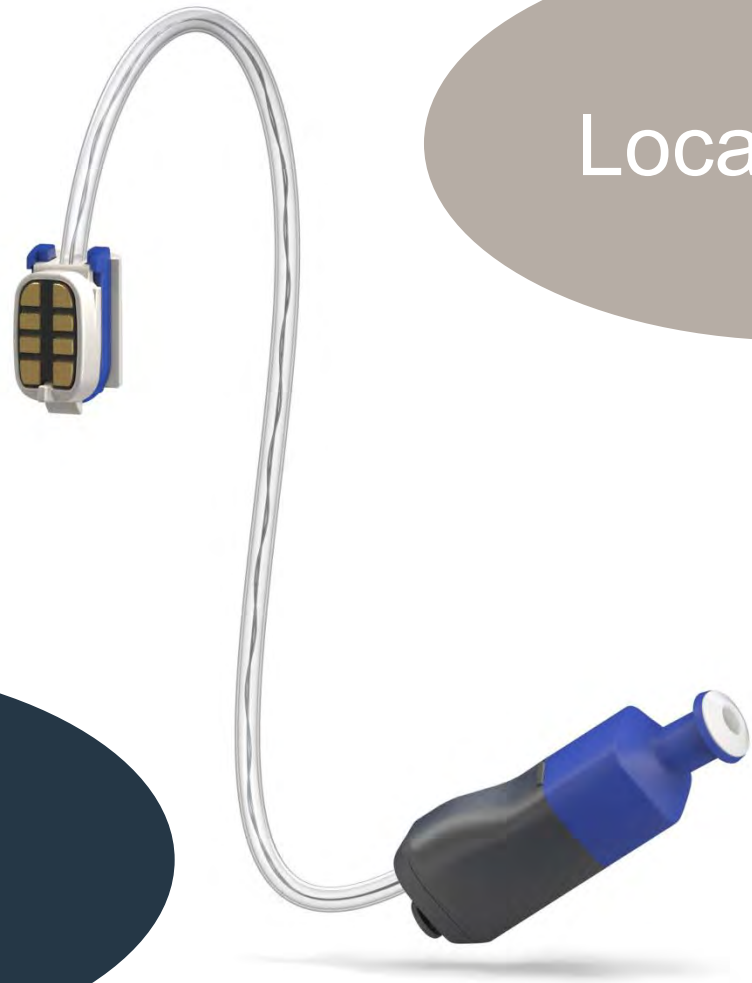
Fitting:  
Best practices



# User benefits of M&RIE?

Reduced  
wind noise


Less  
listening  
effort




Localization

Sound  
quality


# What some users are saying




"It is so hard to describe how it is different from my previous hearing aids, but it undoubtedly is. Things sound less 'processed'." – UK user




"With these devices, hearing is finally fun again!" – German user





"With a microphone positioned on the entrance of the ear canal, there is no need to reposition the phone when using it with the ReSound ONE hearing-aids. The sound is clear and audible." – UK user




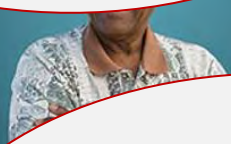

"The sound is more natural (especially with music)." – US user



"Clarity has been just great!" – US user



"I do not need to use the phone app to make adjustments for the immediate environment. These adapt better than any of the previous models." – US user



"I did not think that they could improve on the spatial perception of the ReSound LiNX Quattro, but they have done it!" – US user



# What HCPs are saying

A true WOW  
effect

-HCP, US

As a hearing acoustician, I myself listen to many listening devices, although I have no hearing loss. The first time I had the ReSound ONE in my ear, I was able to identify sounds around me like never before.

-HCP, Germany

It's been a while since I've had a hearing aid deliver the 'wow' factor, the new M&RIE receiver adds a new dimension. I regularly demo with the aids now and customers love them!

-HCP, UK

Patients feel like they aren't wearing hearing aids

-HCP, US

I want to fit every patient with M&RIE, so I want a larger fitting range.

-HCP, US

Patients love them

-HCP, US

# What does research tell us?



Sound quality, listening effort, wind noise, localization

## Sound Quality

Natural sound quality with depth & detail

**90%** Of listeners prefer M&RIE for natural sound quality<sup>1</sup>

**"Best spatial perception, good speech intelligibility and sound quality"**

Preference for M&RIE over omnidirectional mode and over Spatial Sense in various listening conditions<sup>2</sup>

## Localisation

Better localisation and spatial awareness

**31%** Immediate benefit of 31% better front-back localisation with M&RIE<sup>3</sup>

Better localisation and spatial awareness

**57%** Front-back localisation benefit, increasing to 57% after 4 months of wearing M&RIE<sup>3</sup>

## Listening Effort

Less listening effort with M&RIE

**2.6dB** Average listening effort benefit<sup>4</sup>

Better speech understanding in noise

**20%** Percentage point increase in speech recognition in noise with M&RIE placement<sup>4</sup>

Easy, natural placement for calls

**95%** Report near effortless non-streamed phone calls with M&RIE<sup>5</sup>

## Wind noise

Wind noise protection

**15dB** Natural wind noise protection without reducing gain<sup>1</sup>

Wind noise benefit

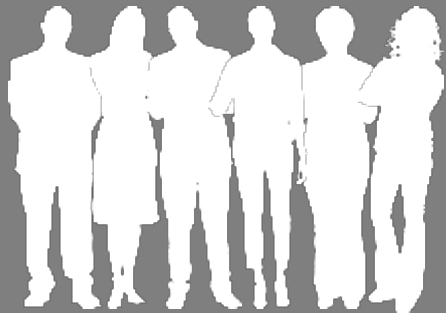
**33%** Better sound quality rating in wind noise<sup>2</sup>

1. Groth J. An innovative RIE with microphone in the ear lets users "hear with their own ears". ReSound white paper, 2020.
2. Andersen P, Schindwolf I, Jespersen C. Less wind noise with M&RIE leads to better sound quality. ReSound white paper, 2021.
3. Jespersen C, Schindwolf I, Groth J. Benefits of M&RIE with long-term use. ReSound white paper, 2021. Write up in progress, title subject to change
4. Quilter M, Groth J, Krueger M. Reduced listening effort and improved speech intelligibility with M&RIE. ReSound white paper, 2021. Write up in progress, title subject to change
5. Quilter M, Hartenstein R, and Groth J. Percentage of users who report regular calls without effort or very little effort, 2021
6. Jespersen C, Kirkwood B, Schindwolf I. M&RIE receiver preferred for sound quality and localisation. ReSound white paper, 2020.

# Sound Quality



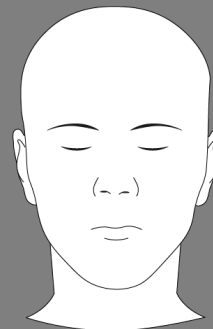
# Sound Quality



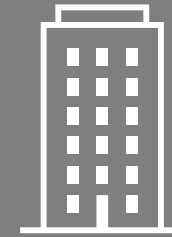
Participants with normal hearing



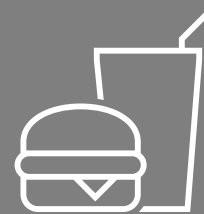
Pinna compensation



M&RIE



Office



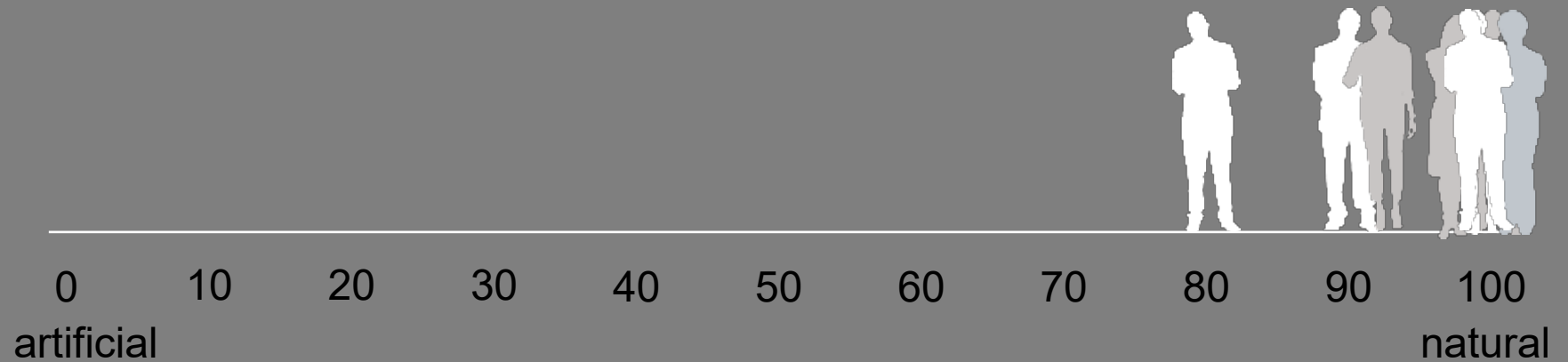
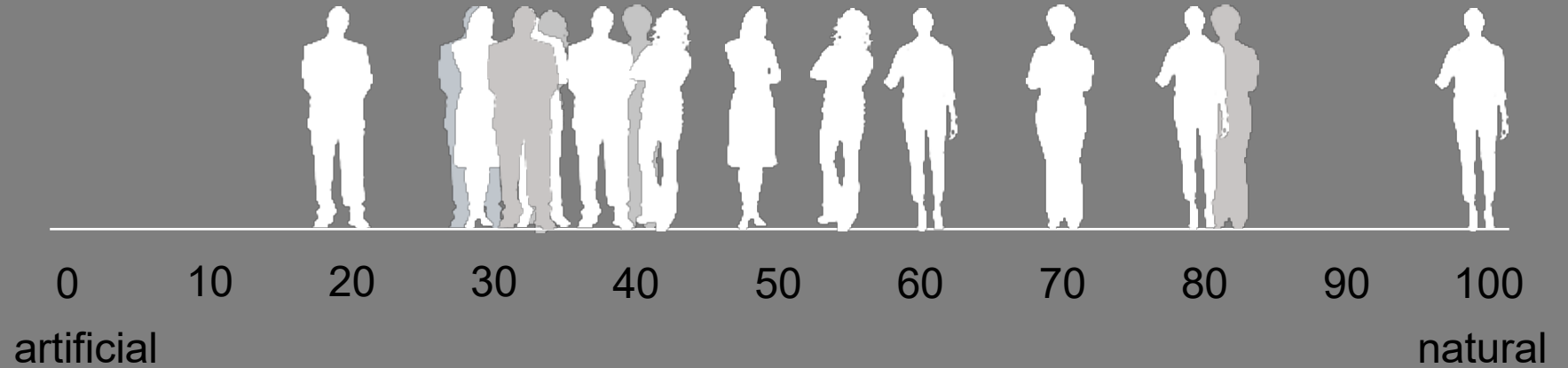
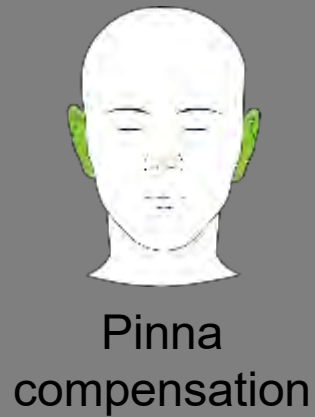
Cafeteria



Jazz

# Sound Quality

## Overall Sound Quality



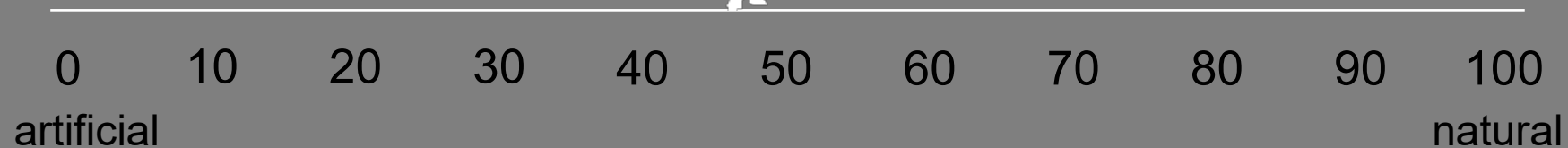
# Sound Quality

## Overall Sound Quality



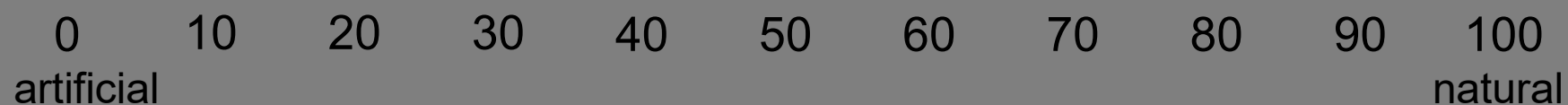
Pinna compensation

**48**  
average  
rating



M&RIE

**96**  
average  
rating

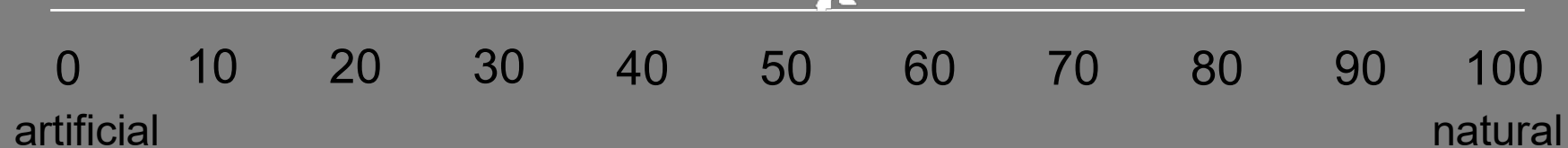


# Sound Quality

# Spatial Sound Quality



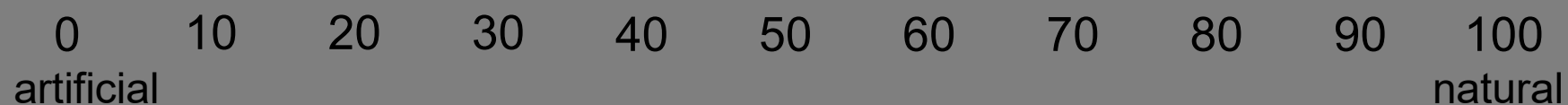
Pinna compensation



53  
average  
rating



M&RIE



99  
average  
rating





## Participants

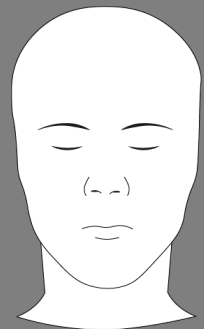


listeners with  
normal hearing



listeners with bilateral  
mild-to-moderate  
hearing loss

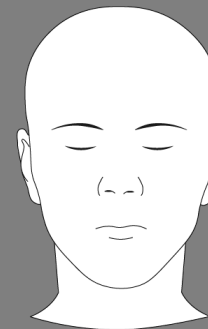
# Sound Quality



Program 1  
Omnidirectional



Program 2  
Spatial Sense



Program 3  
M&RIE



Cafeteria



Traffic



Train station

# Sound Quality

## Strong preference for M&RIE



listeners with normal hearing



87%

Preferred M&RIE over omnidirectional



70%

Preferred M&RIE over Spatial Sense



listeners with hearing loss



70%

Preferred M&RIE over omnidirectional



57%

Preferred M&RIE over Spatial Sense

## Sound Quality

ReSound GN

**Natural sound quality with depth & detail**

**90%**

Of listeners prefer  
M&RIE for natural  
sound quality<sup>1</sup>

**“Best spatial perception, good speech  
intelligibility and sound quality”**

Preference for M&RIE over omnidirectional  
mode and over Spatial Sense in various  
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2. Jespersen C, Kirkwood B, Schindwolf I. M&RIE receiver preferred for sound quality and localisation. ReSound white paper, 2020.

# Localisation

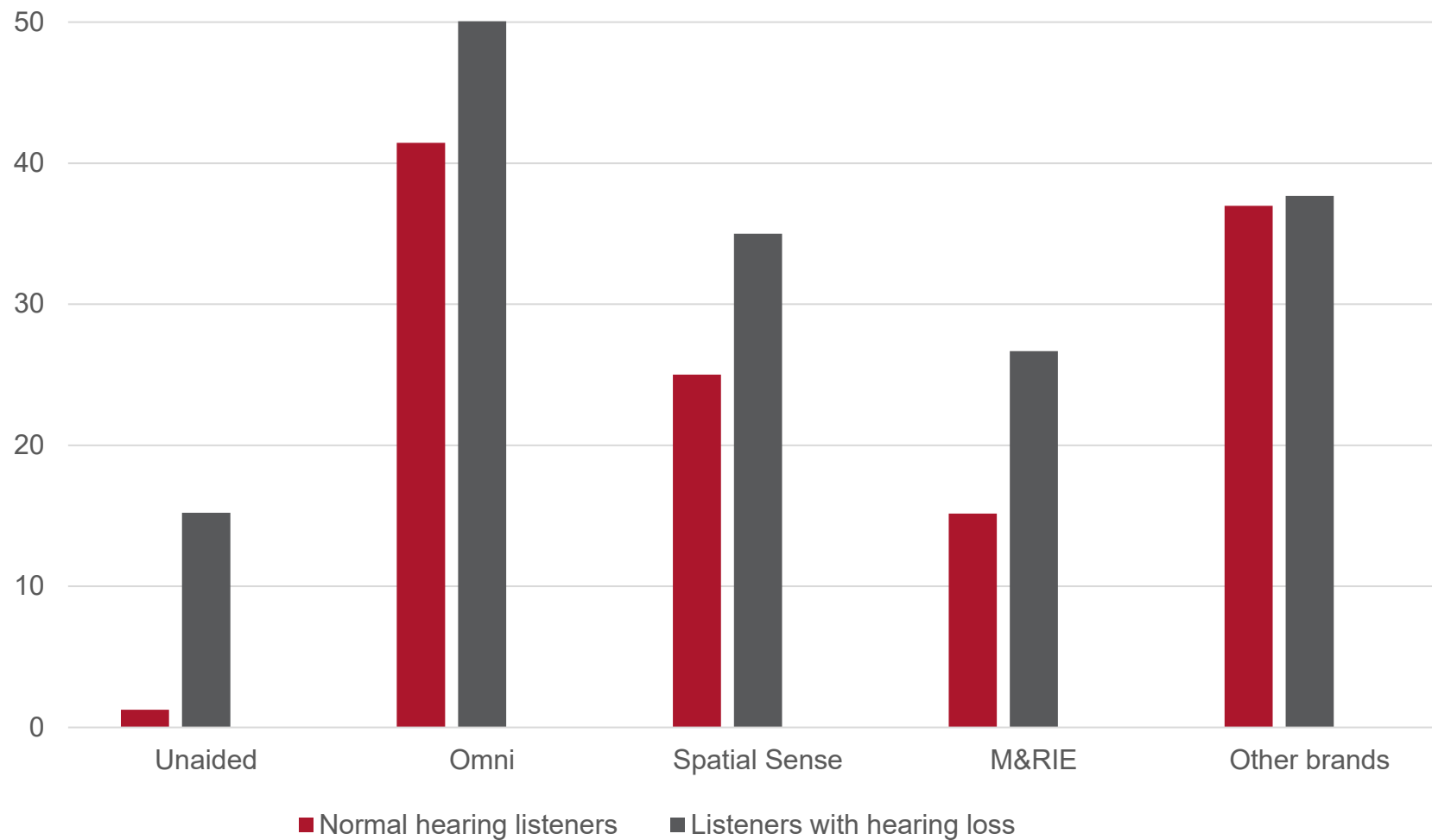


# Localisation



# Localisation

## Average localisation error

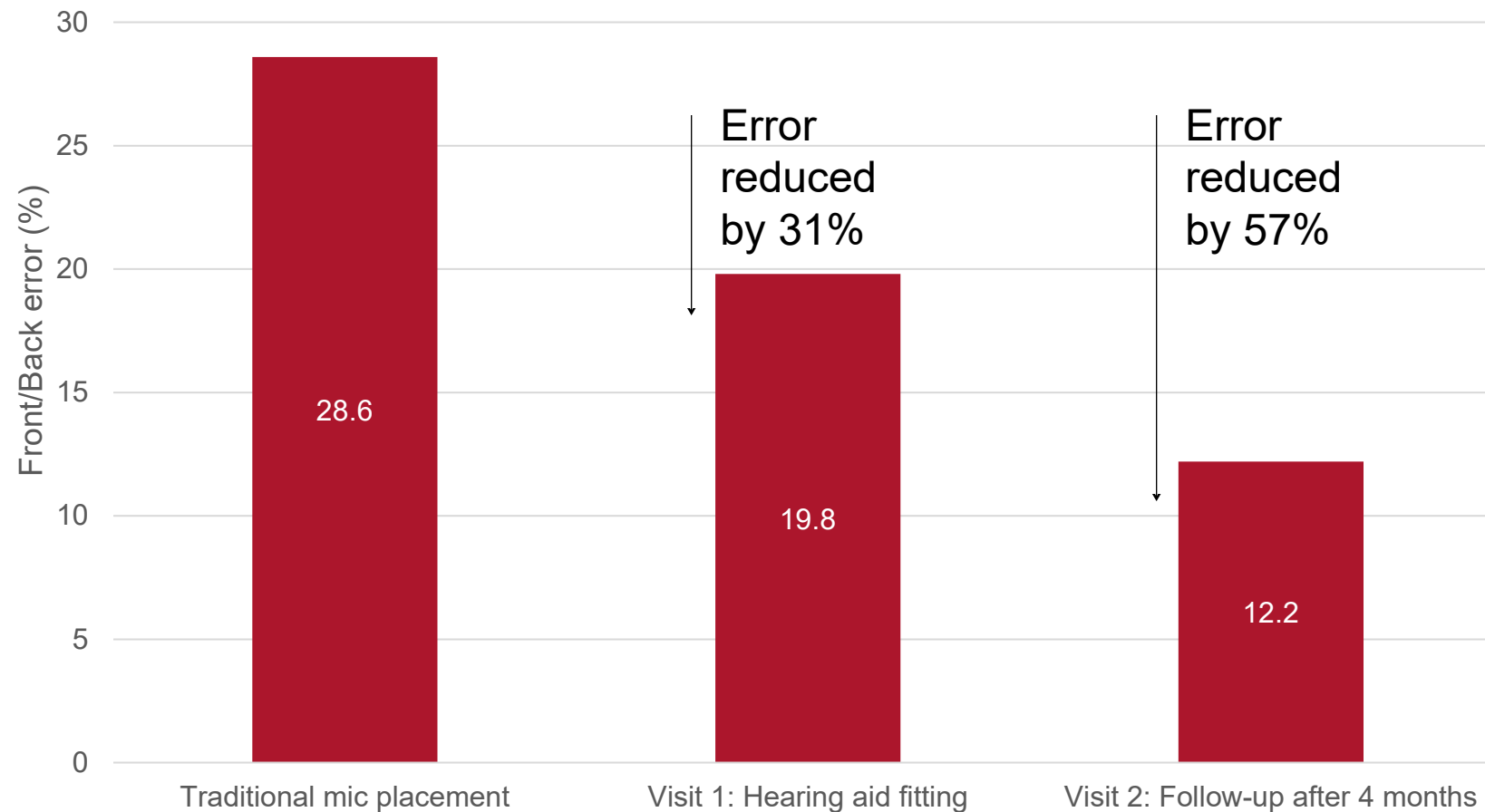


# Localisation





## Localisation benefit



## Localisation

### Better localisation and spatial awareness

**31%**

Immediate benefit of 31% better front-back localisation with M&RIE<sup>3</sup>

### Better localisation and spatial awareness

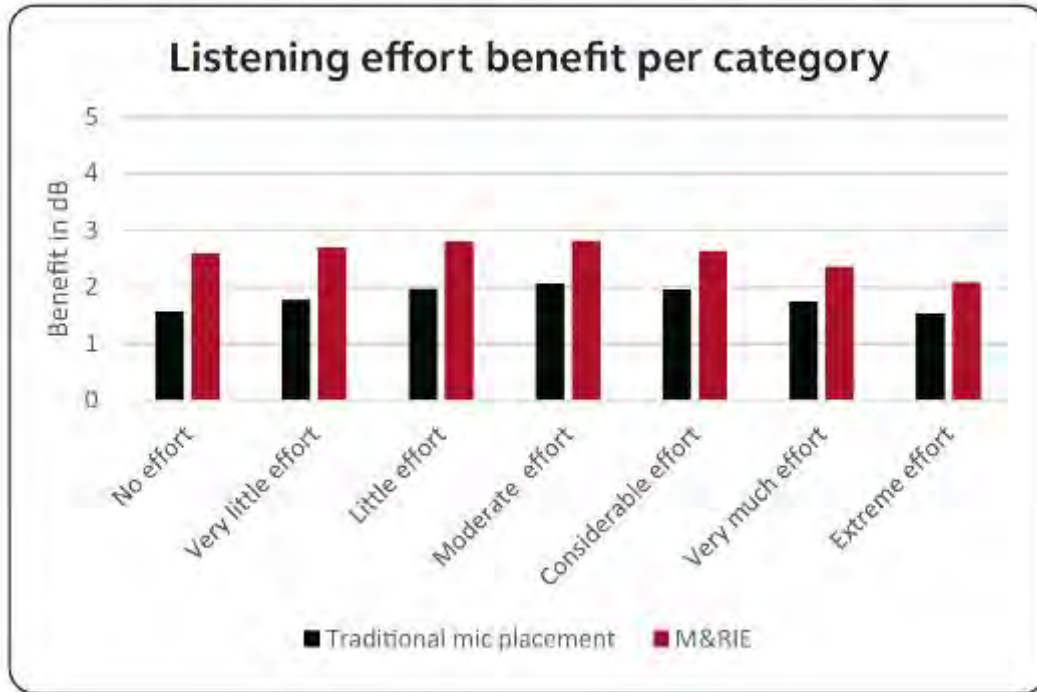
**57%**

Front-back localisation benefit, increasing to 57% after 4 months of wearing M&RIE<sup>3</sup>

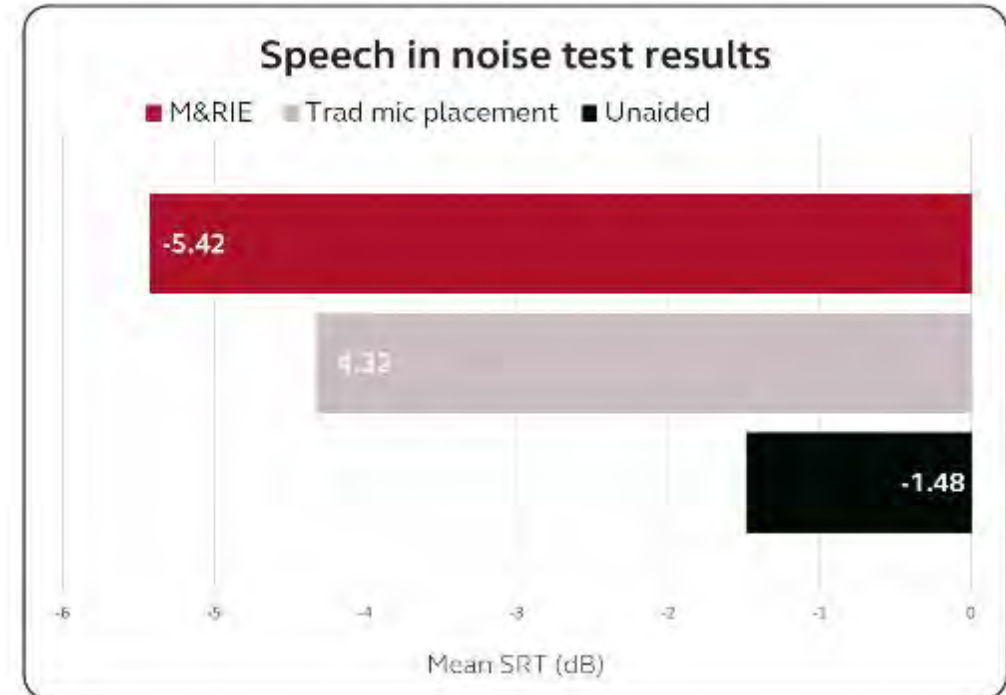
# Listening Effort



# Listening Effort



- 2.6 dB overall listening effort benefit with M&RIE
- Only 1.8 dB benefit with traditional mic placement

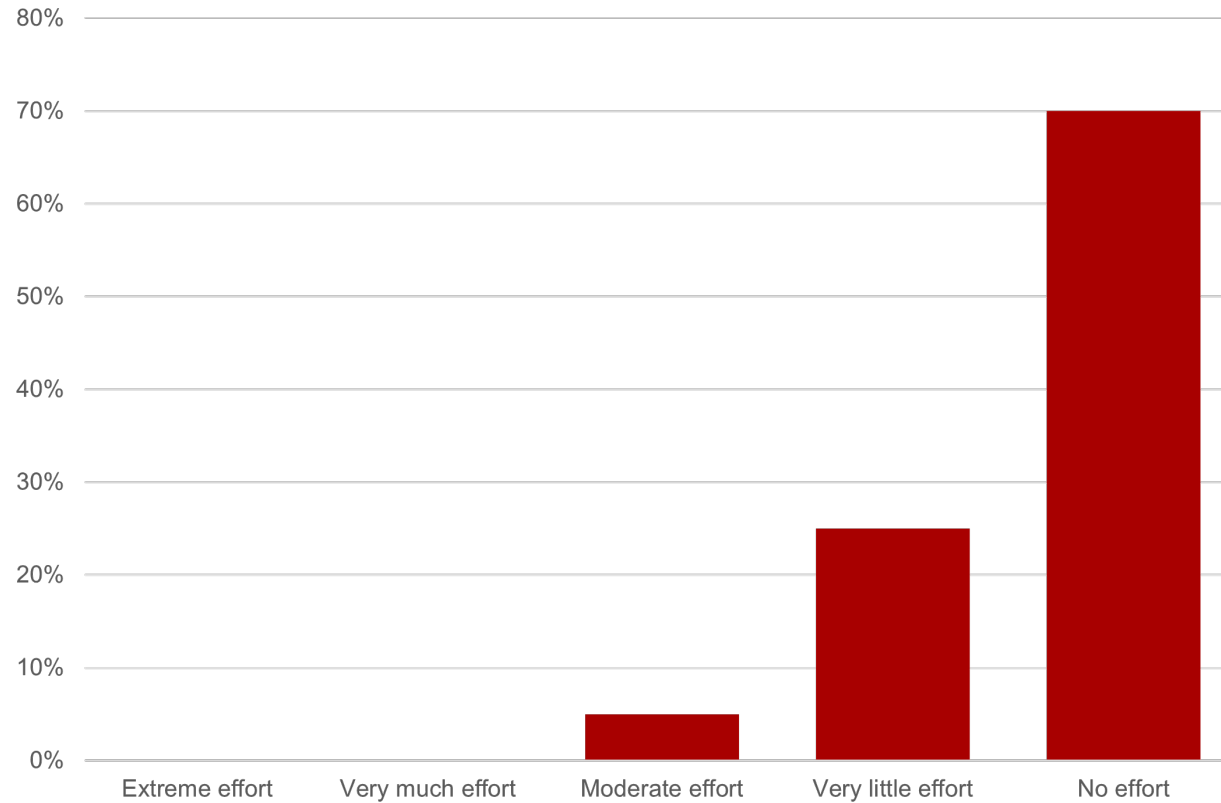


- Speech recognition better with M&RIE than with traditional mic placement

# Listening Effort

## Phone placement study

Effort ratings for finding the correct positioning of the telephone while wearing hearing aids



## Listening Effort

ReSound GN

**Less listening effort with M&RIE**

**2.6dB** Average listening effort benefit<sup>4</sup>

**Better speech understanding in noise**

**20%** Percentage point increase in speech recognition in noise with M&RIE placement<sup>4</sup>

**Easy, natural placement for calls**

**95%** Report near effortless non-streamed phone calls with M&RIE<sup>5</sup>

4. Compared to traditional mic placement. Quilter et al, 2021

5. Percentage of users who report regular calls without effort or very little effort. Quilter, Hartenstein and Groth, 2021.

Wind noise

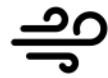
ReSound GN



# Wind noise

Difference in average wind noise:  
M&RIE vs omnidirectional setting (dB)

Light Breeze: 2 m/s



**19 dB**

Gentle Breeze: 5 m/s



**15 dB**

Fresh Breeze: 8 m/s

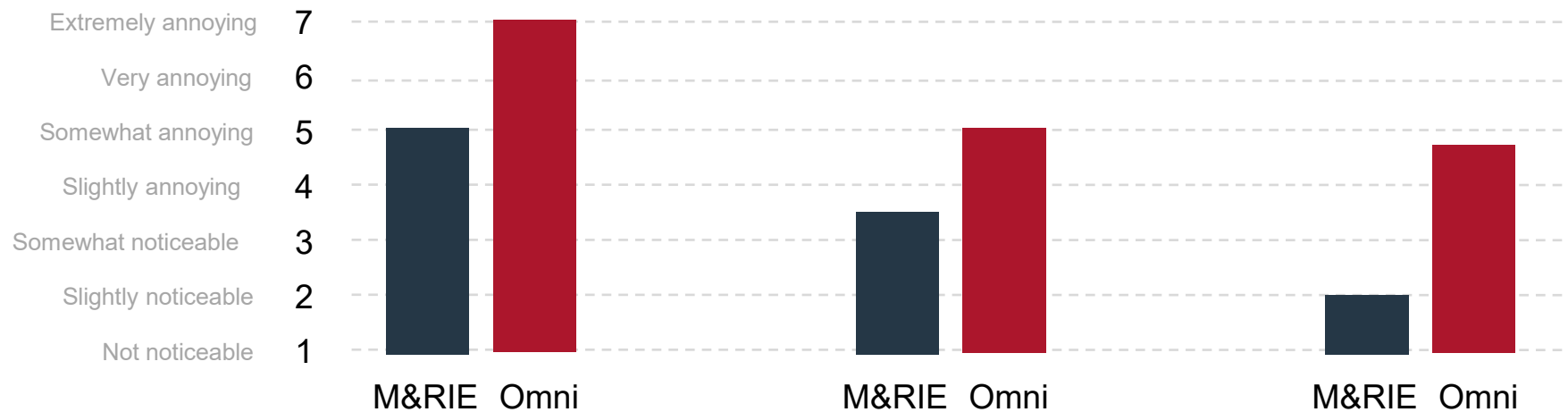
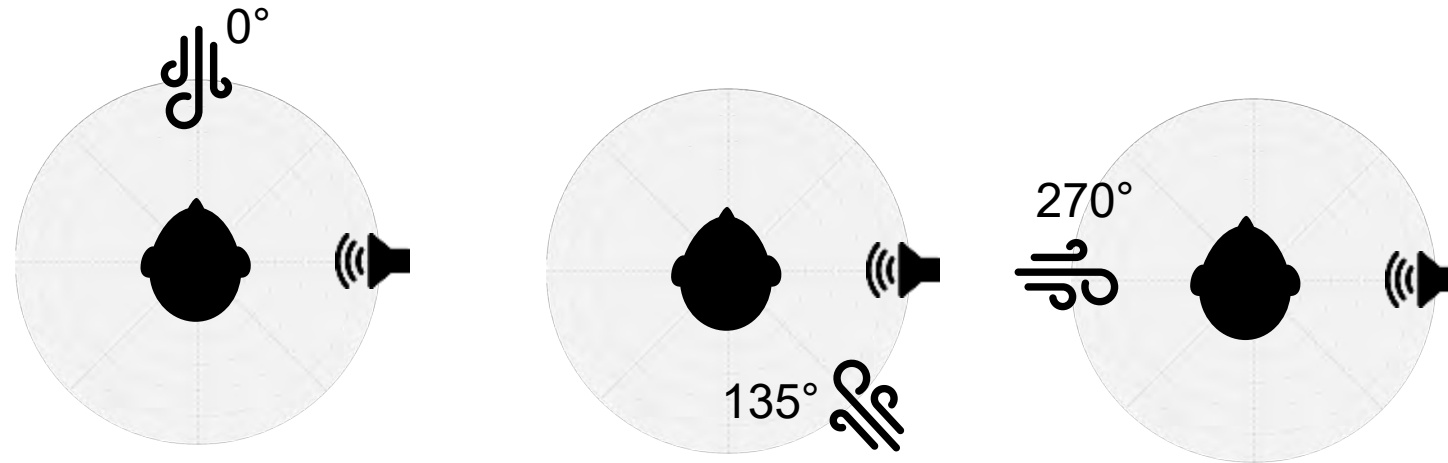


**14 dB**



# Wind noise

## M&RIE provides 33% better sound quality rating in wind noise than traditional mic placement





Wind noise

ReSound GN

### Wind noise protection

**15dB** Natural wind noise protection without reducing gain<sup>1</sup>

### Wind noise benefit

**33%** Better sound quality rating in wind noise<sup>2</sup>

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M&RIE  
benefits

Testimonials

Research

Convince a  
colleague!



# Determining Candidacy



# Steps

1

## Determine preliminary candidacy

- Hearing loss
- Slope
- Fitting range
- Ear anatomy

2

## Counsel appropriately

- Set expectations
- Do not oversell – in case of limiting factor

3

## Select physical properties

- Choose initial dome or earmold
- Use audiological best practices

4

## Connect and calibrate

- Connect to software
- Calibrate DFS
- Nothing new here!

5

## Observe MSG curve

- Adjust acoustic coupling as needed
- Re-run DFS calibration
- Confirm M&RIE candidacy

6

## Save and exit

- Send on trial
- Own environment

1

Determine preliminary candidacy

2

Counsel appropriately

3

Select physical properties

4

Connect and calibrate

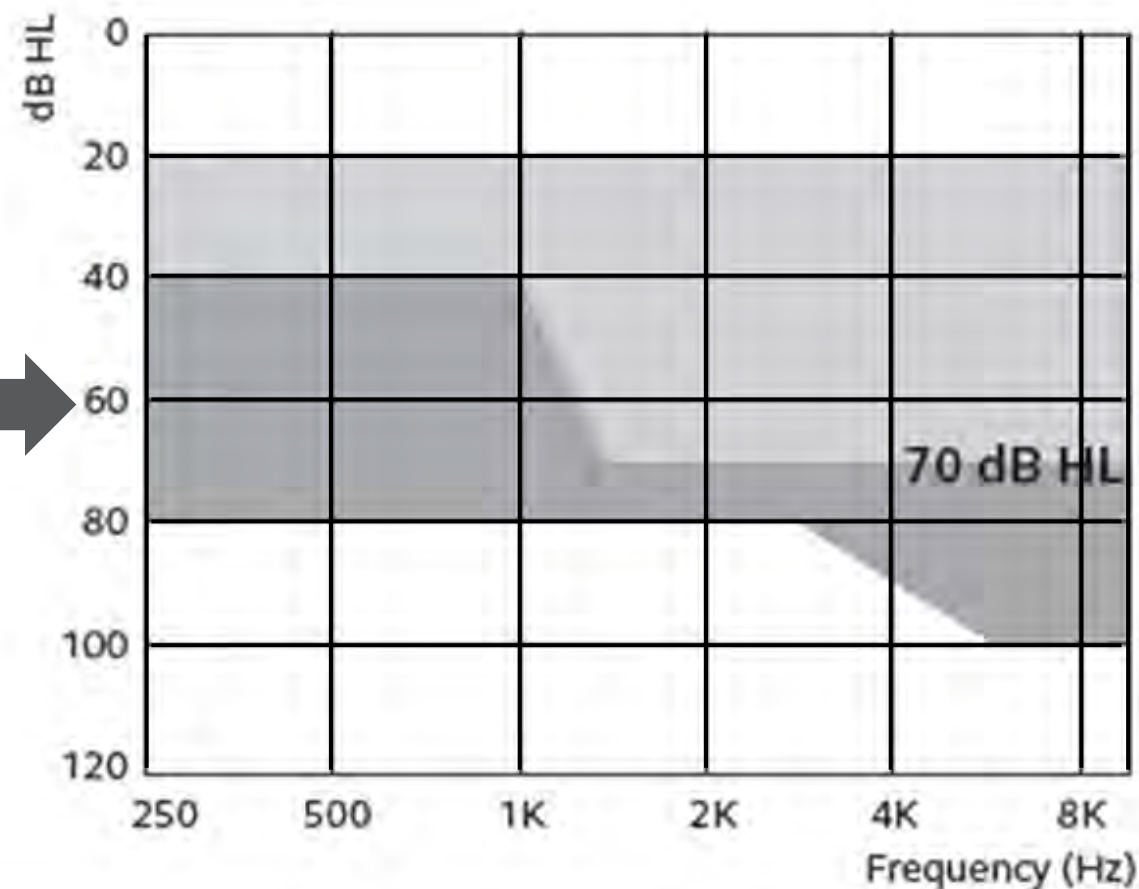
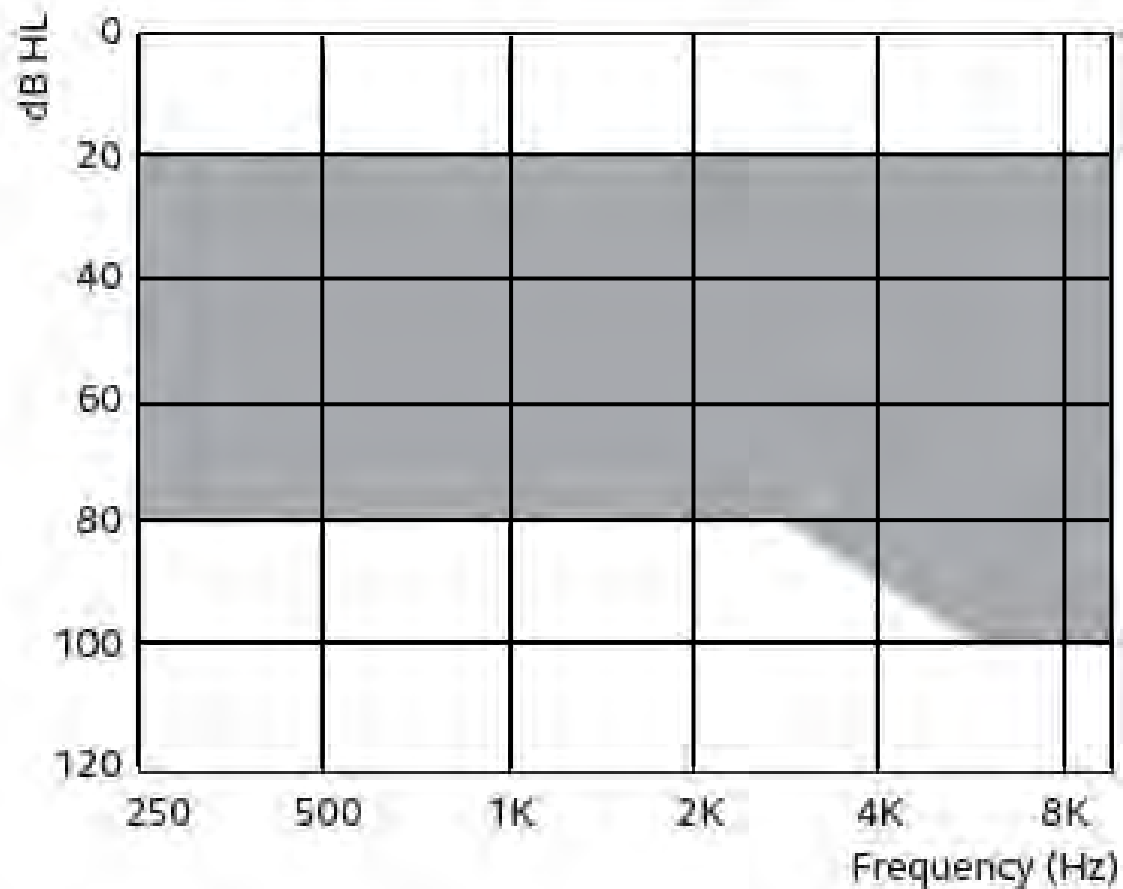
5

Observe MSG curve

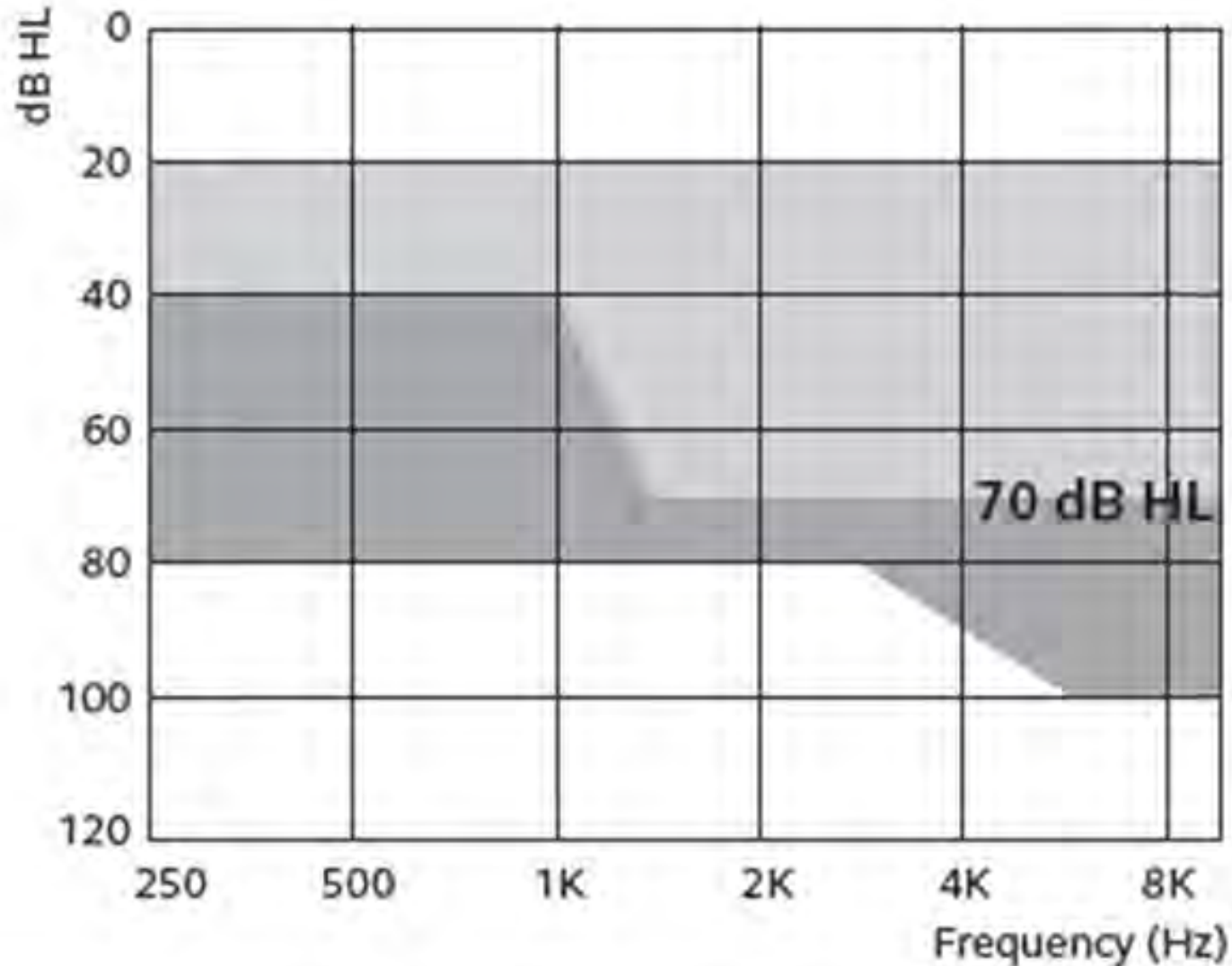
6

Save and Exit

# Candidacy recommendations



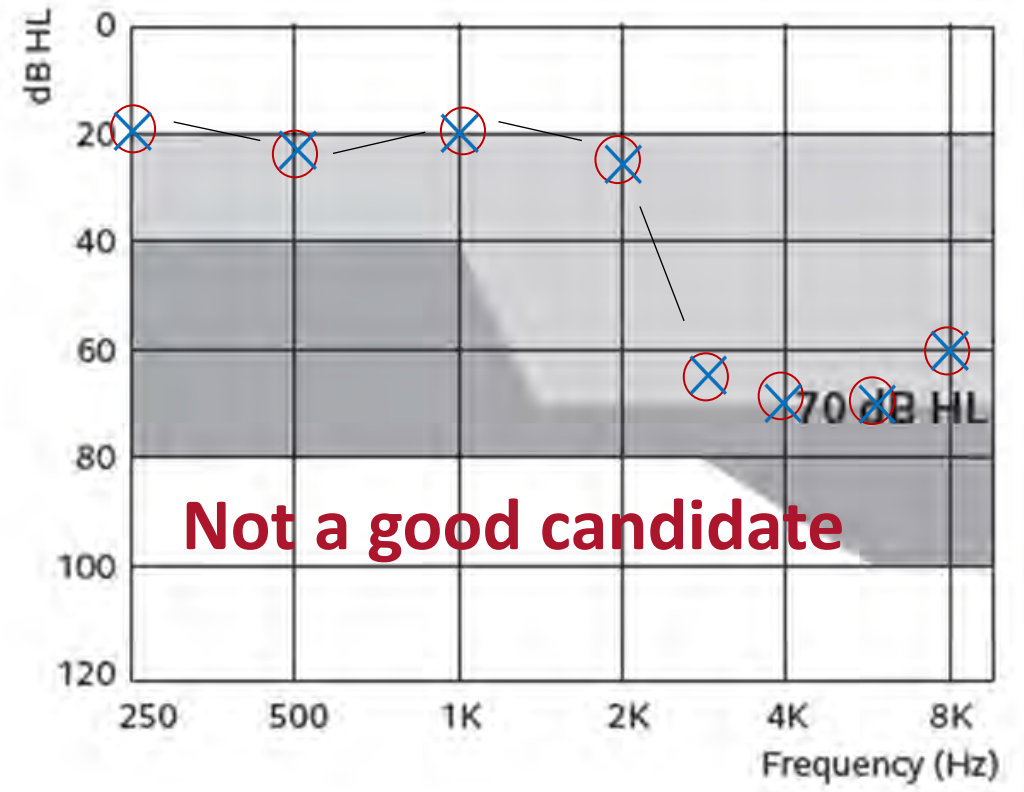
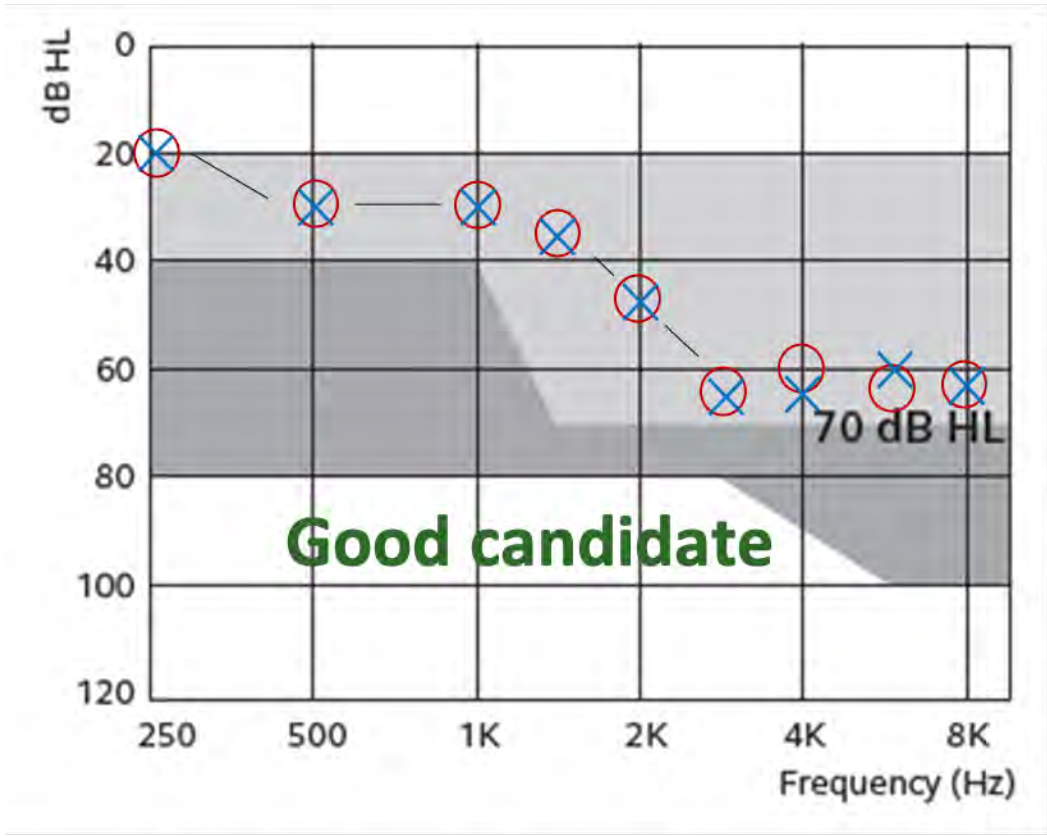
# Additional candidacy recommendations

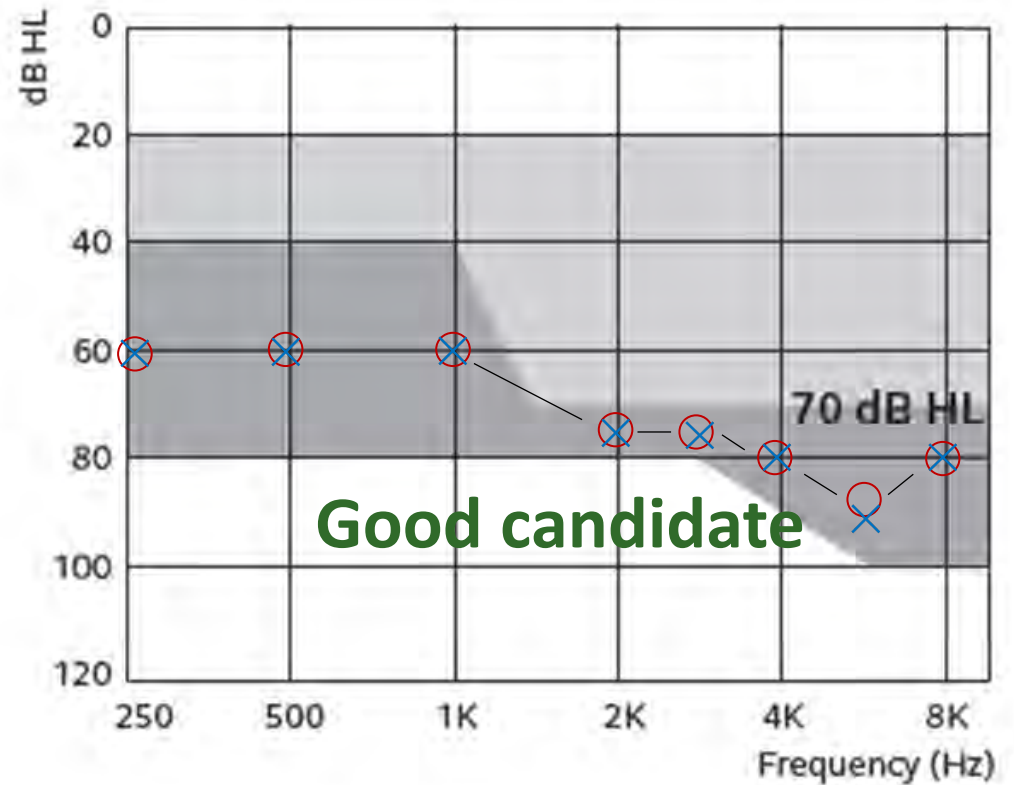
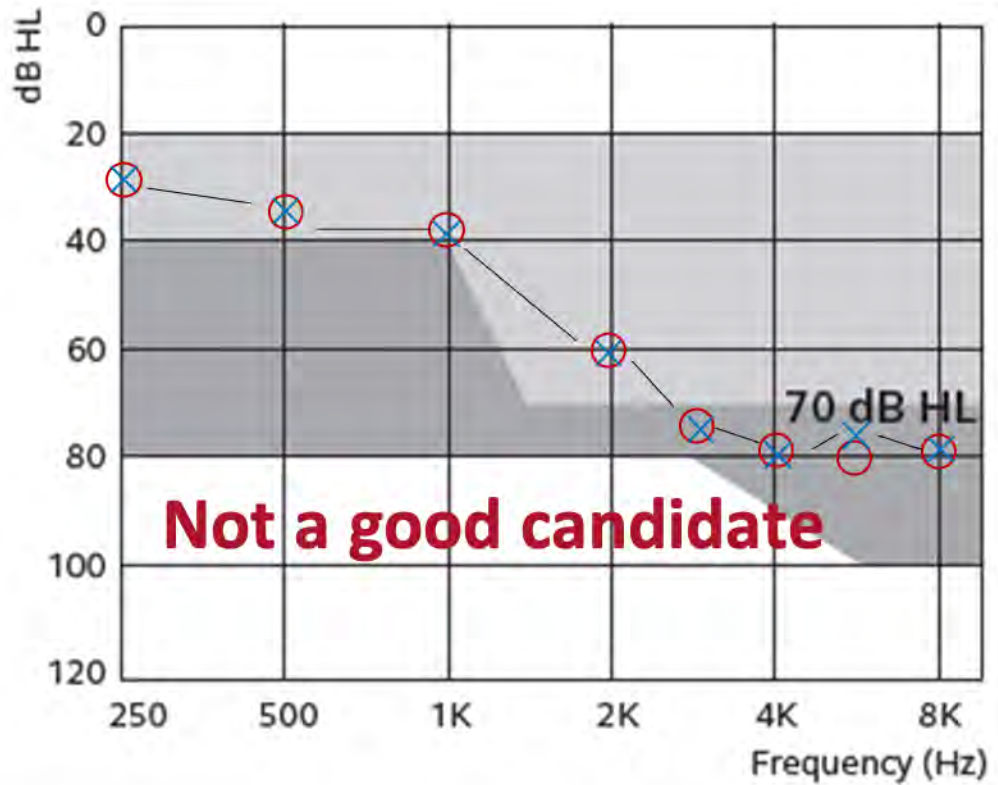


## Good candidates...

- ...are comfortable with a closed, tulip or power dome.
- ...display ear anatomy with no unusual characteristics such as sharp bends, bony growths or narrow canals.
- ...do not have steeply sloping hearing losses.
- ...have no more than 10dB of gain overlapping with the MSG curve. (more on that in a minute!)
- ...have thresholds falling either entirely in the light gray area OR entirely in the dark grey area, but not both.







1

Determine preliminary candidacy

2

Counsel appropriately

3

Select physical properties

4

Connect and calibrate

5

Observe MSG curve

6

Save and Exit

Restate difficulties  
Specific scenarios  
Relevant concerns



Recommend  
Benefits of ReSound ONE  
RIE model  
Tech level  
Hardware



Set expectations  
Measurements will determine appropriate hardware  
Will consider individual ear anatomy



Which receiver?  
M&RIE  
Standard  
- LP  
- MP  
- HP  
- UP



Real-world impacts  
Will not be heard in office  
Spatial perception  
Wind noise reduction

1

Determine preliminary candidacy

2

Counsel appropriately

3

Select physical properties

4

Connect and calibrate

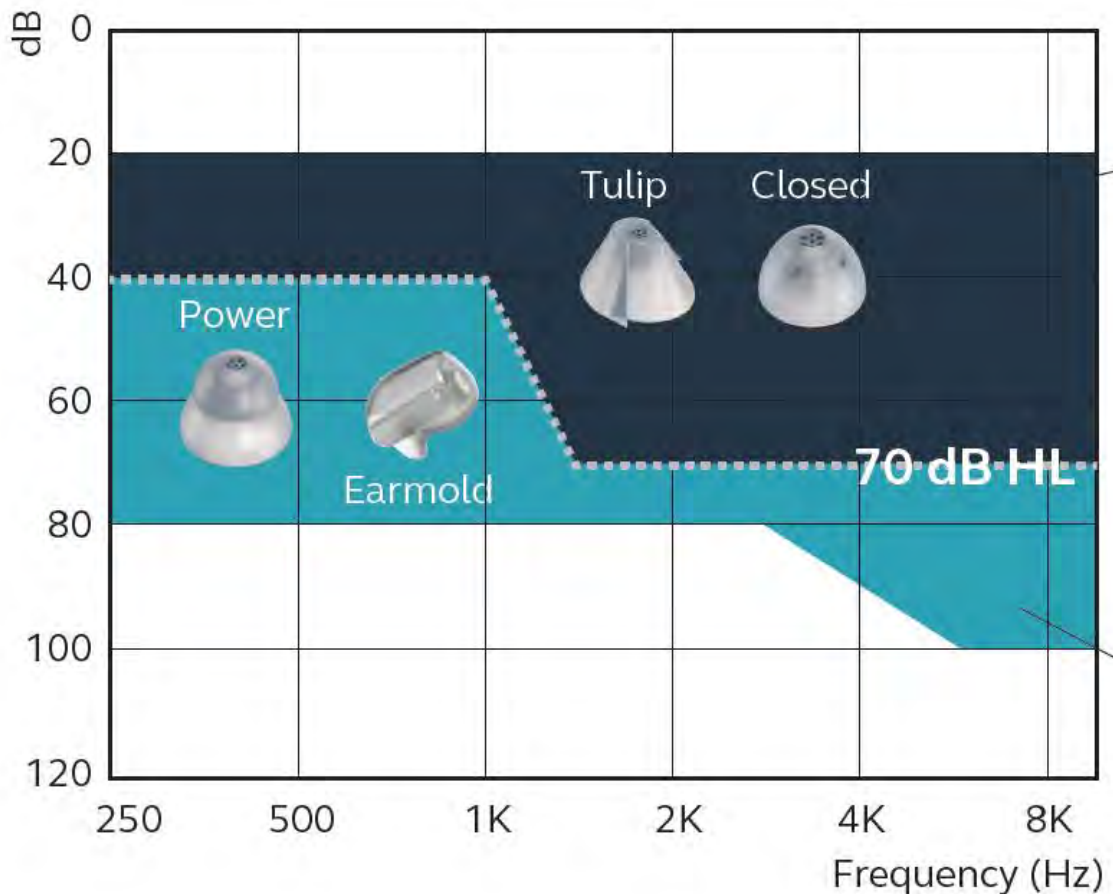
5






Observe MSG curve

6

Save and Exit

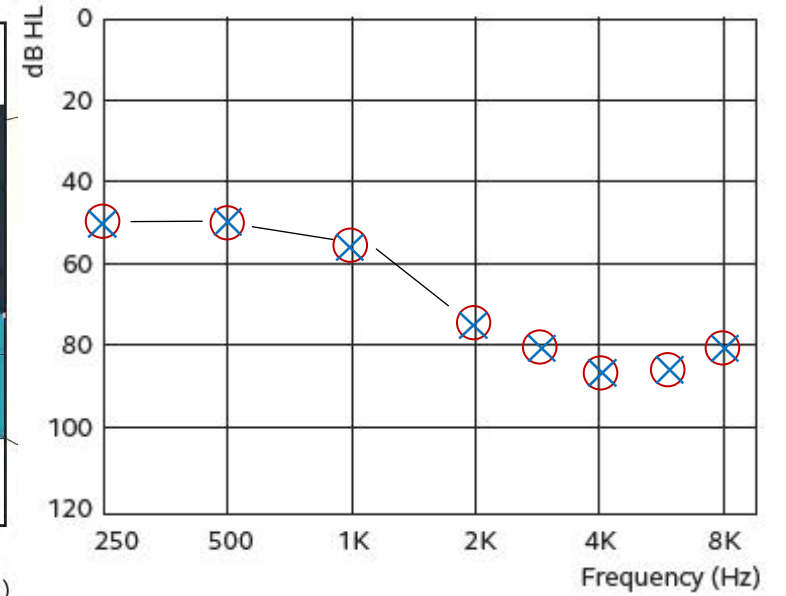
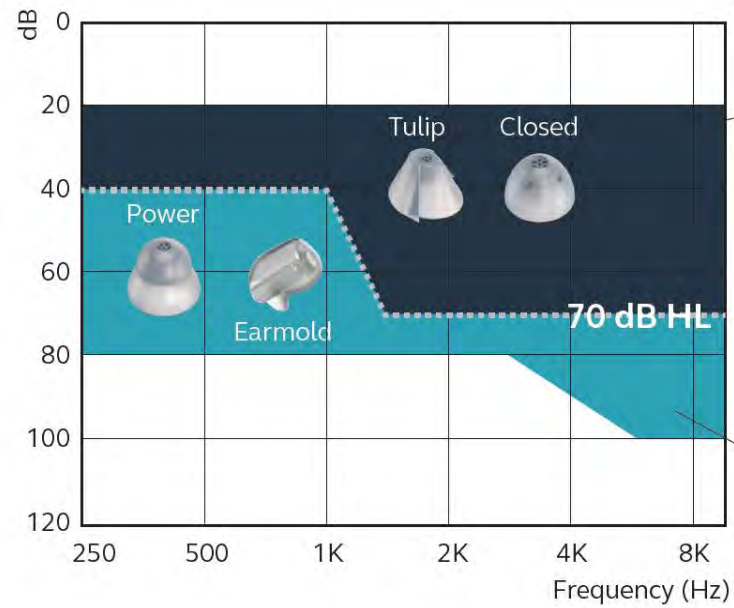
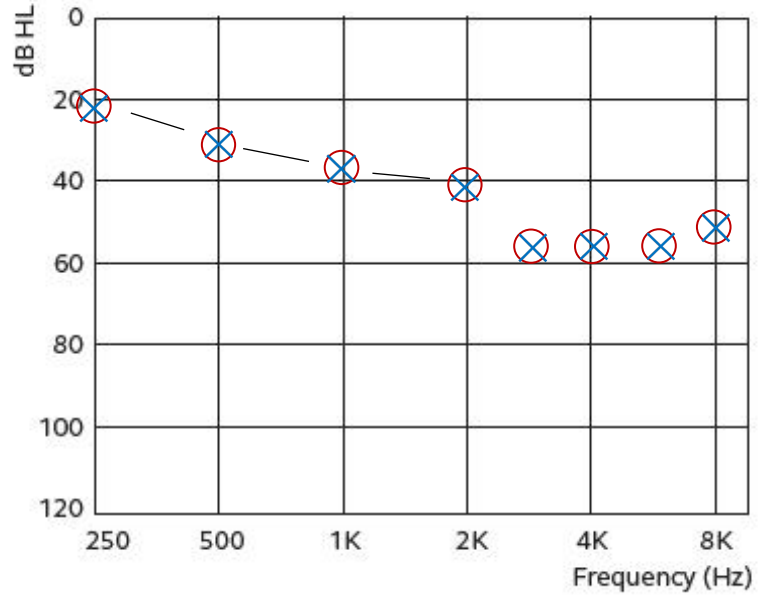
# How to get the most organic sound with M&RIE



-  Best results are obtained with Closed or Tulip dome
-  Tulip and Closed domes are rated equally good and provide the same degree of occlusion
-  Tulip and Closed domes increase available stable gain by approximately 3 dB relative to the Open dome
-  Power domes and earmolds are recommended for users with hearing loss within this range
-  Earmolds are an excellent option for people with moderate-to-severe hearing loss

**NOTE: It is not recommended to start a M&RIE fitting with an open dome**

# Which dome would you start with?



1

Determine preliminary candidacy

2

Counsel appropriately

3

Select physical properties

4

Connect and calibrate

5

Observe MSG curve

6

Save and Exit

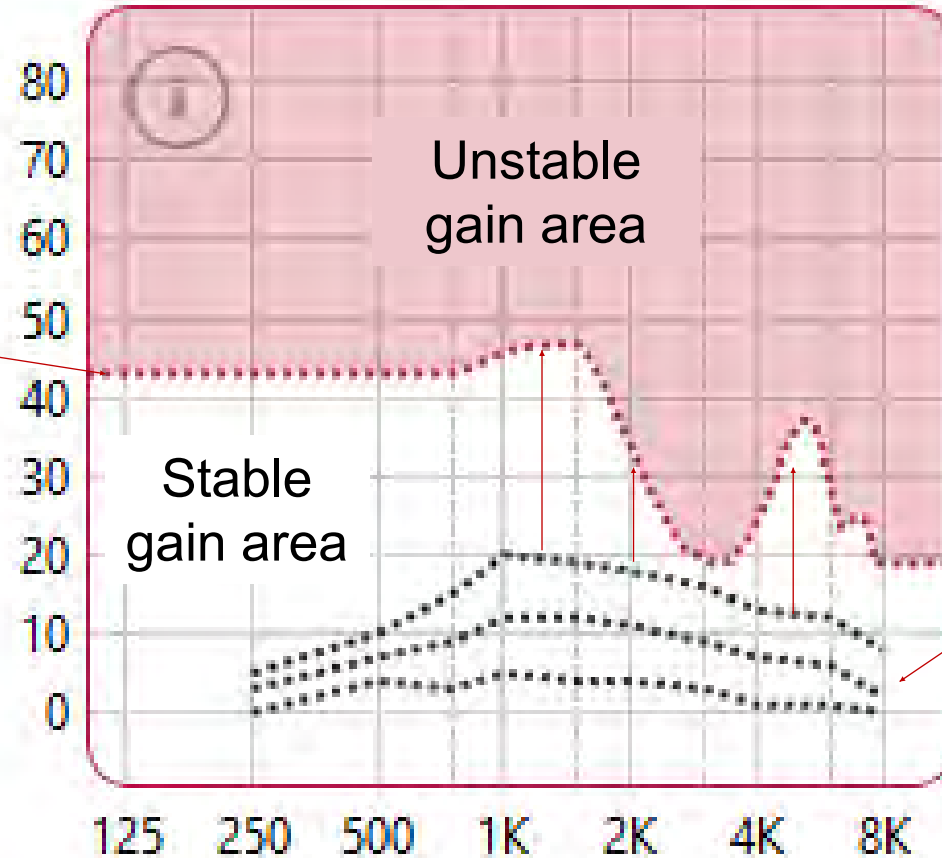




M&RIE  
Microphone & Receiver-In-Ear

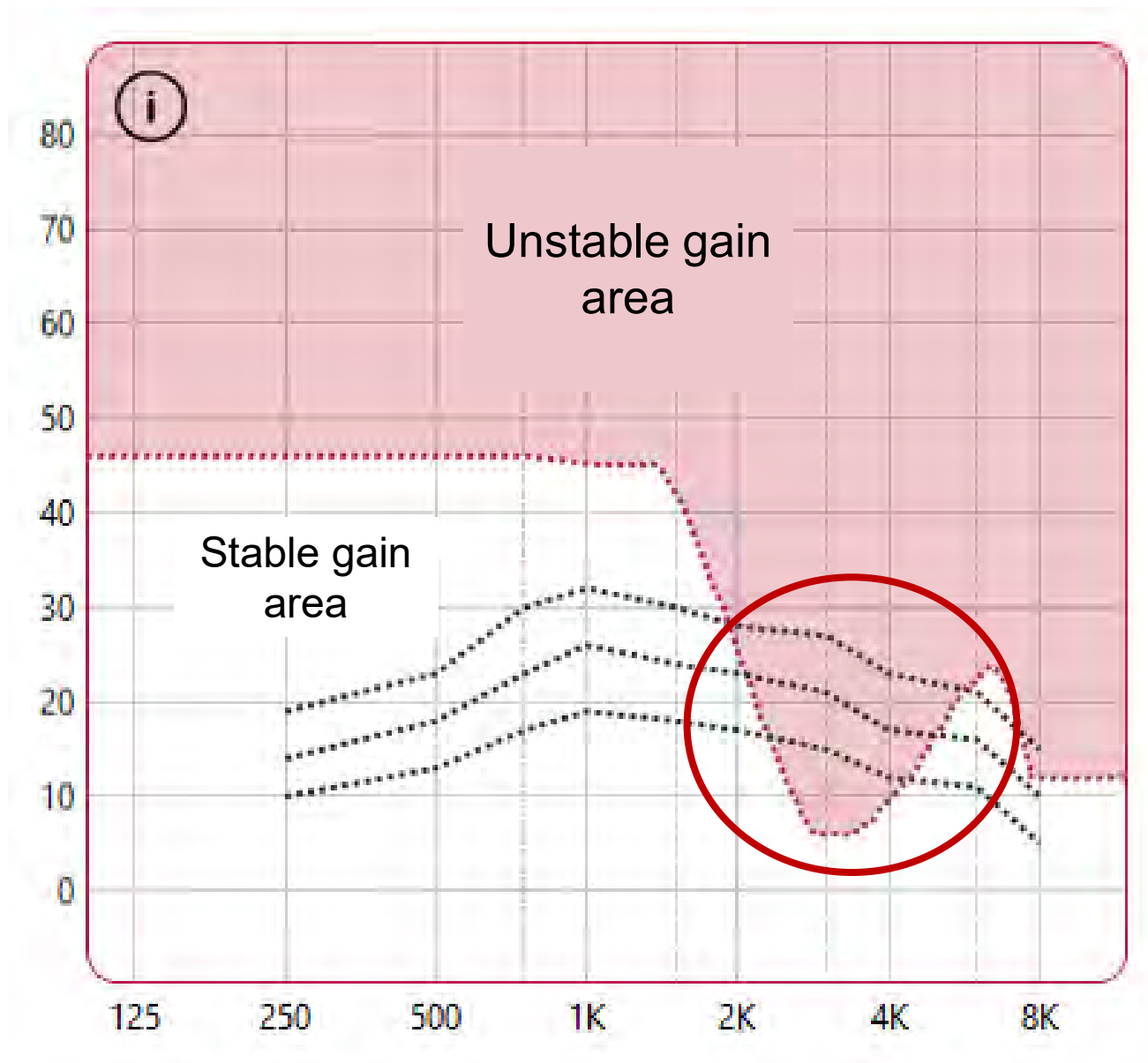
# MSG curve information

Max stable gain curve

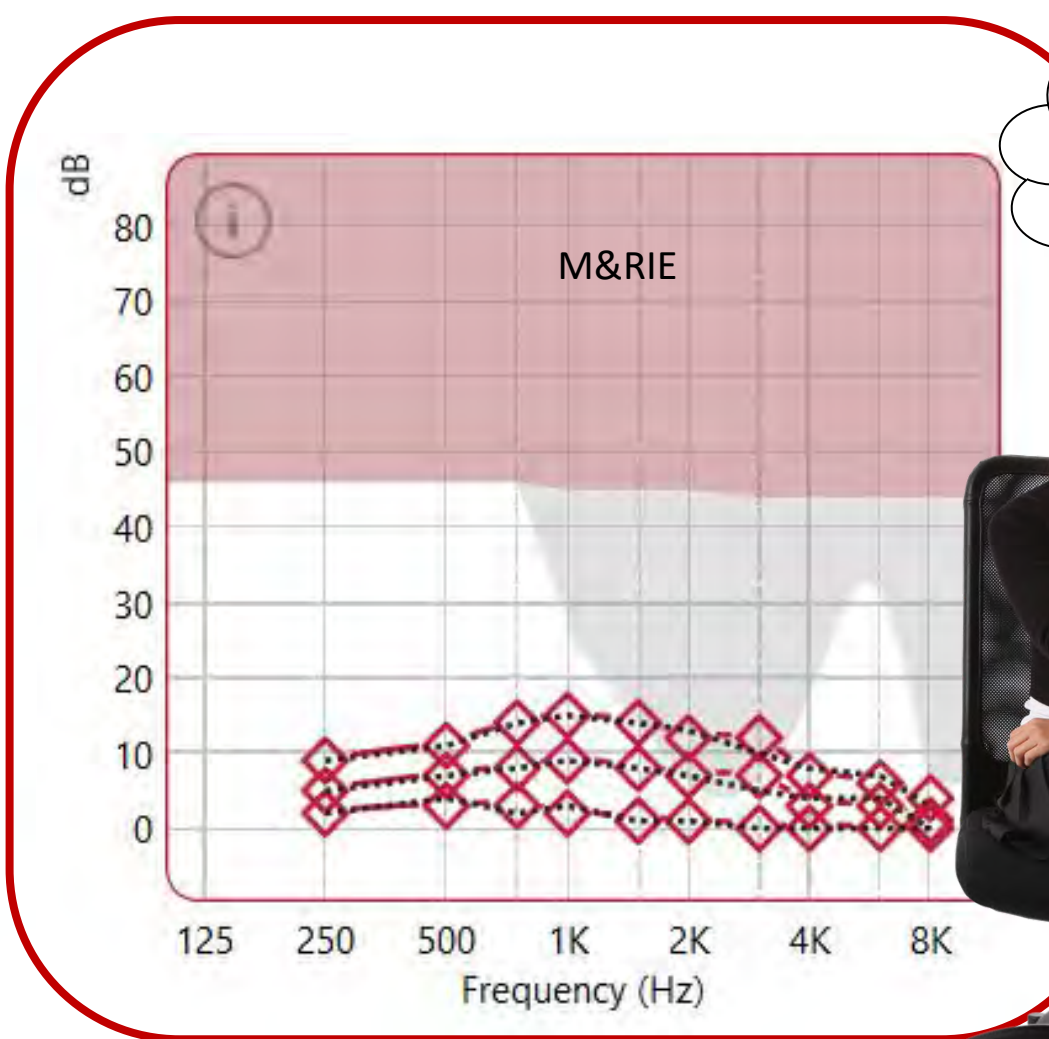
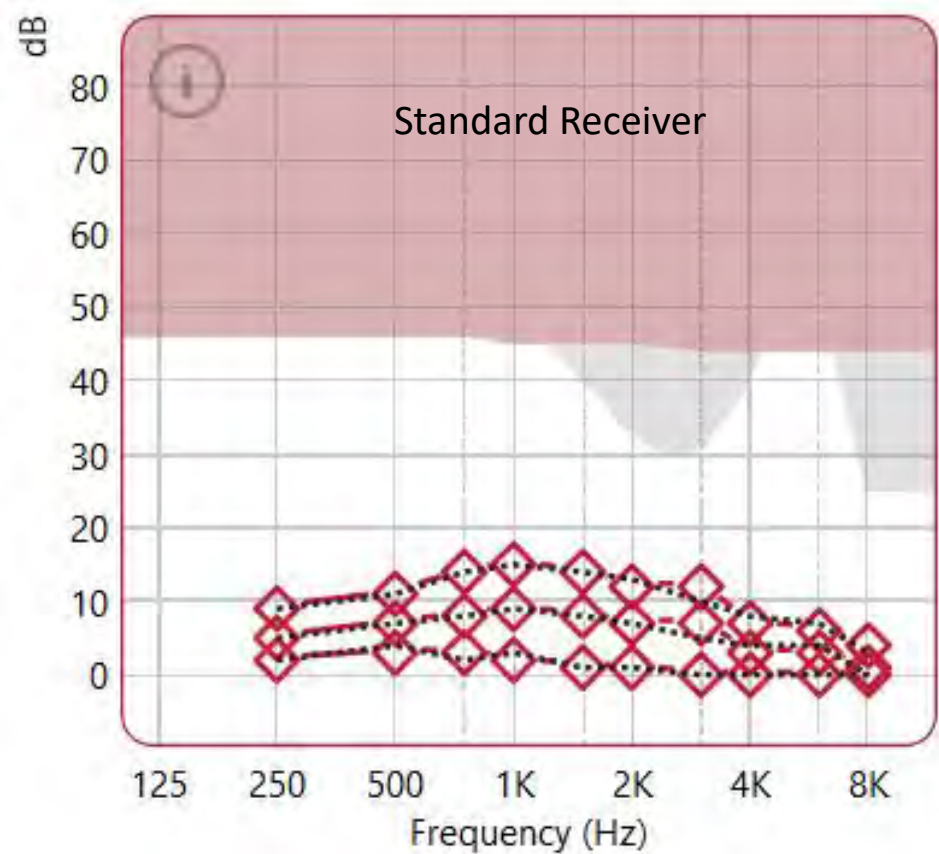


Target gain curves calculated based on the HL

# MSG curve information



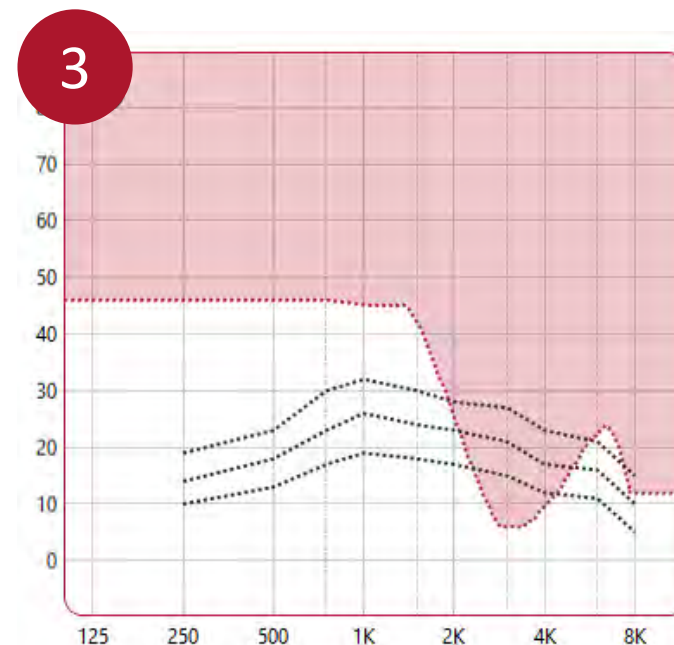
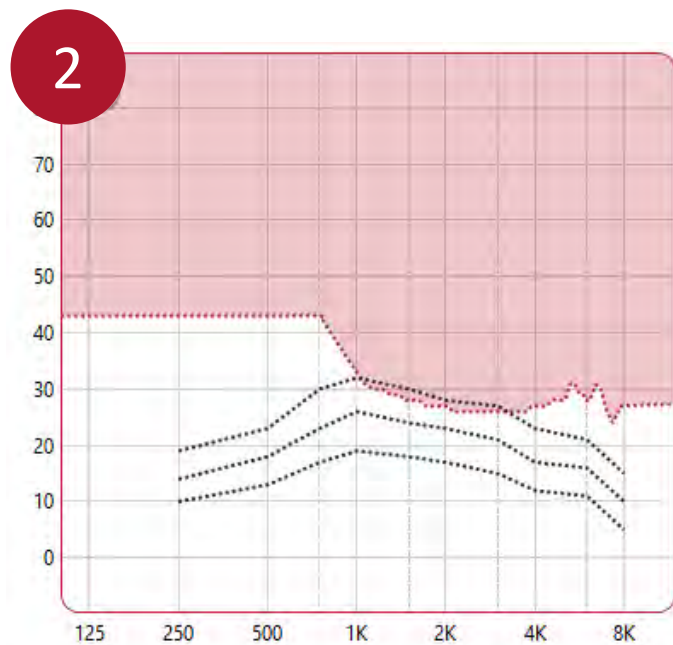
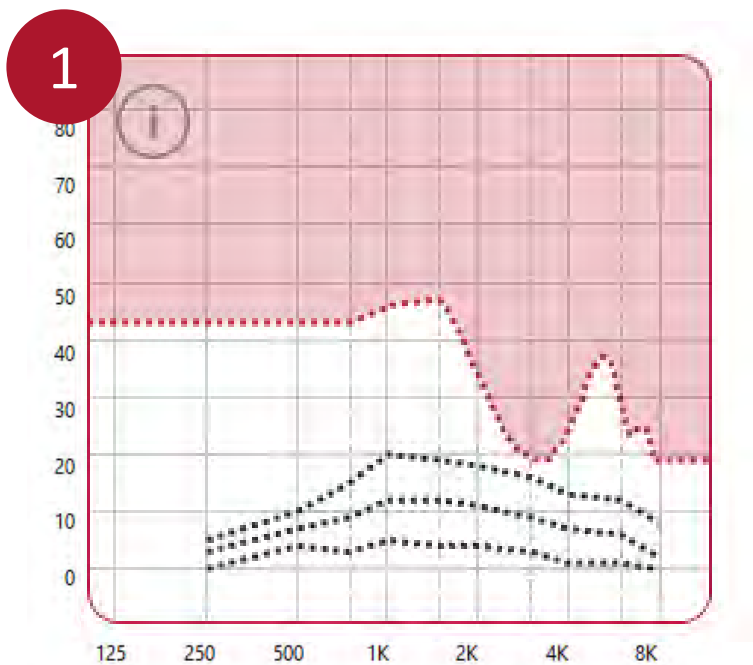
# Impact on MSG curve by receiver type



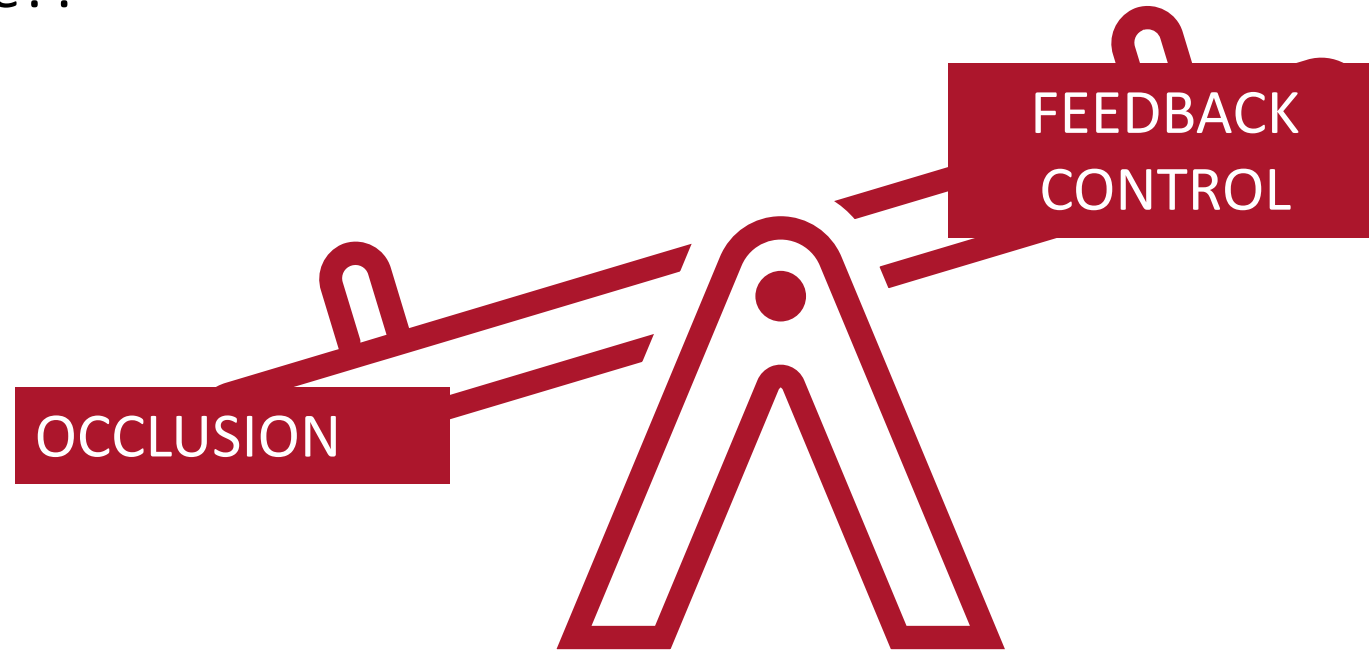
Hmm...Does this make a good candidate?



# MSG curve and candidacy



Why wouldn't you fit  
everyone with the most  
occluding dome??



# Candidacy scenarios



# Candidacy scenarios

## Case 1



## Case 2

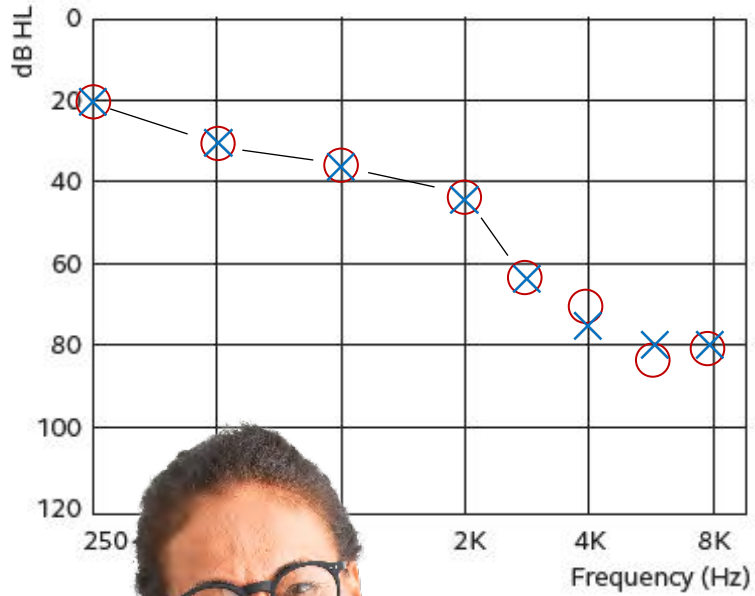


## Case 3





# Cheryl

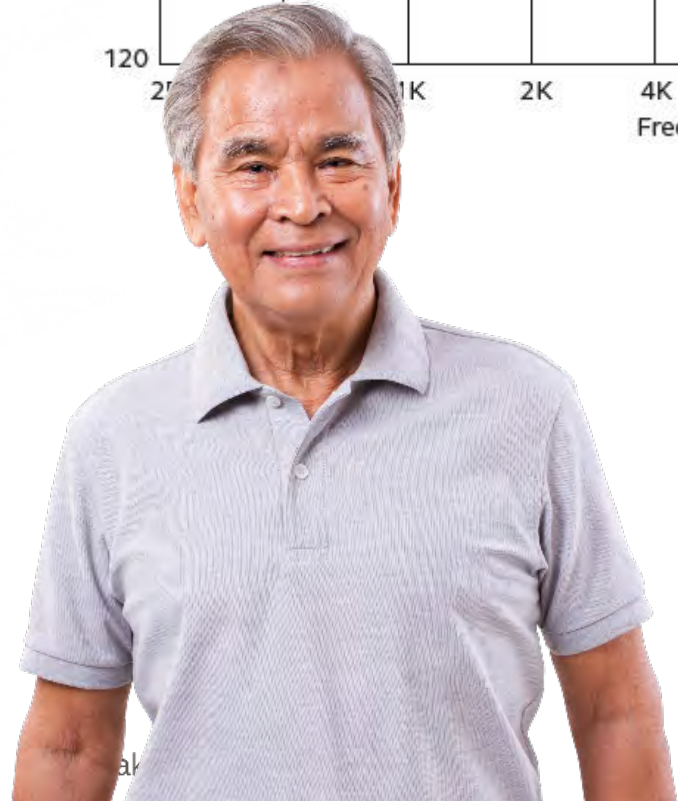
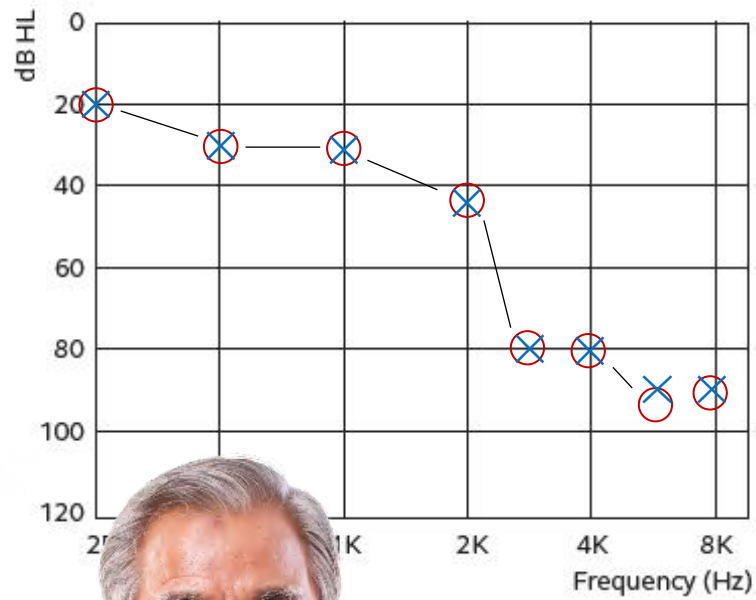


Cheryl is...

**A possible M&RIE candidate!**

- Diagnosed with a hearing loss > 7 years ago
- Tried hearing aids 2 years ago
- Returned due to the poor sound quality
- Very small ear canals
- Difficulty wearing even the smallest earbuds for streaming audio
- Enjoys gardening, beekeeping and playing tennis

Mark

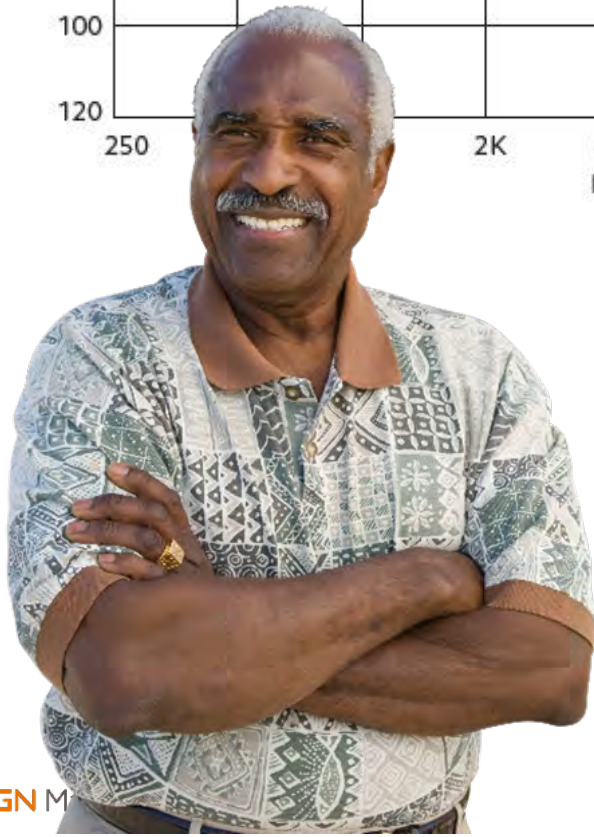
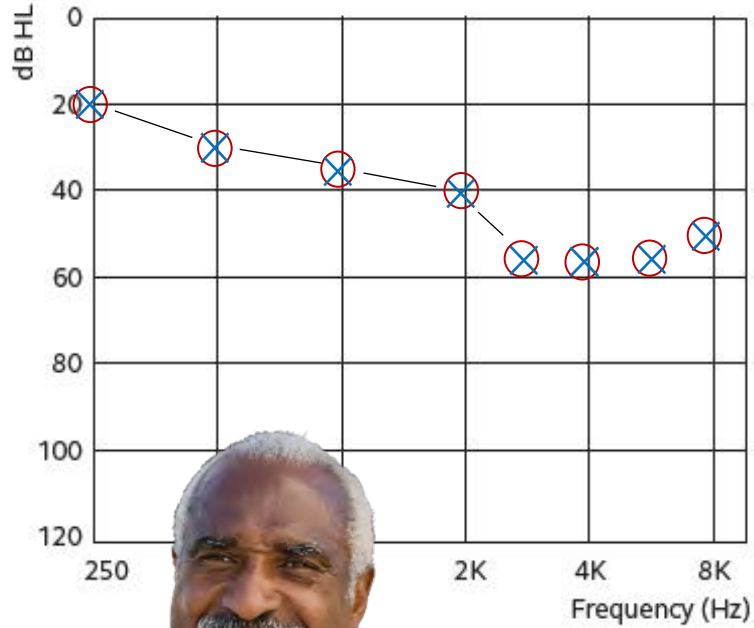


Mark is...

**NOT a good M&RIE candidate!**

- Lifelong musician
- Very particular about sound quality
- Experienced user x many years, currently RIEs
- Strongly prefers open domes
- Walks with his wife
- Time with grandchildren
- Nature preserves.

# George



George is...

A great M&RIE candidate!

- Retired Air Force
- Complaint: sound quality
- Has worn several pairs
- Currently RIEs, tulip domes
- Cycling, golfing, gatherings, gardening

What did we cover?

M&RIE benefits

Testimonials

Research

Candidacy

Counseling

Fitting:  
Best practices



Thank you!