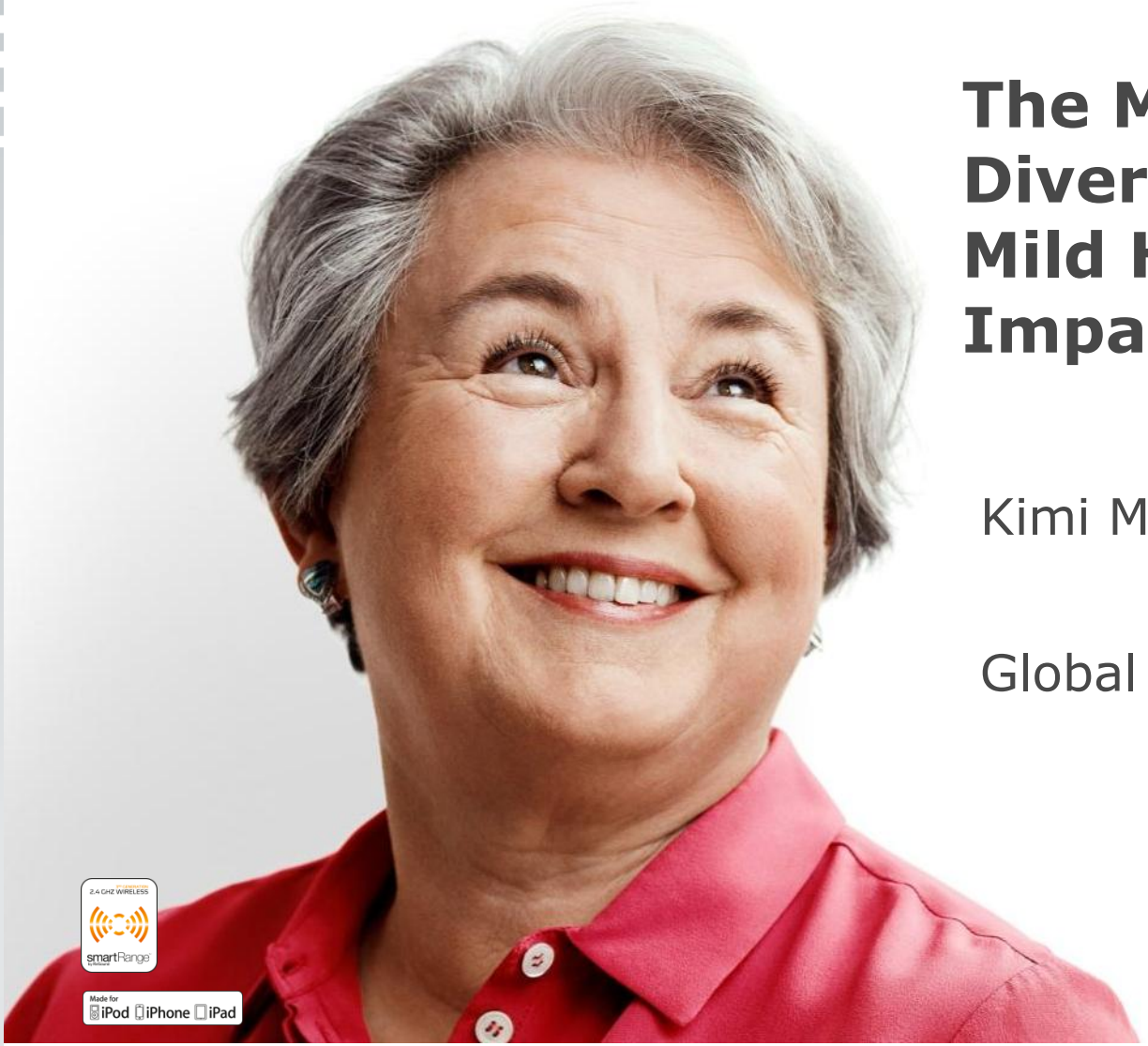


The Mild Misnomer: Diverse Needs for Mild Hearing Impairment

Kimi Møller, M.A.

Global Audiology, ReSound AS

ReSound

rediscover hearing

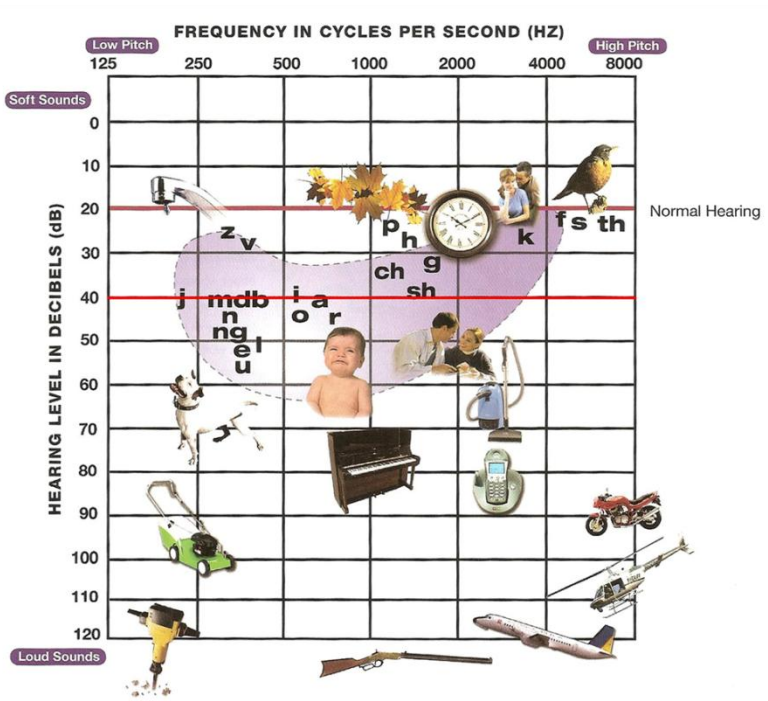
Overview

- Mild hearing losses
- Expectation management
- Mild hearing loss solutions
- Common fitting errors when fitting mild hearing losses
- Q & A

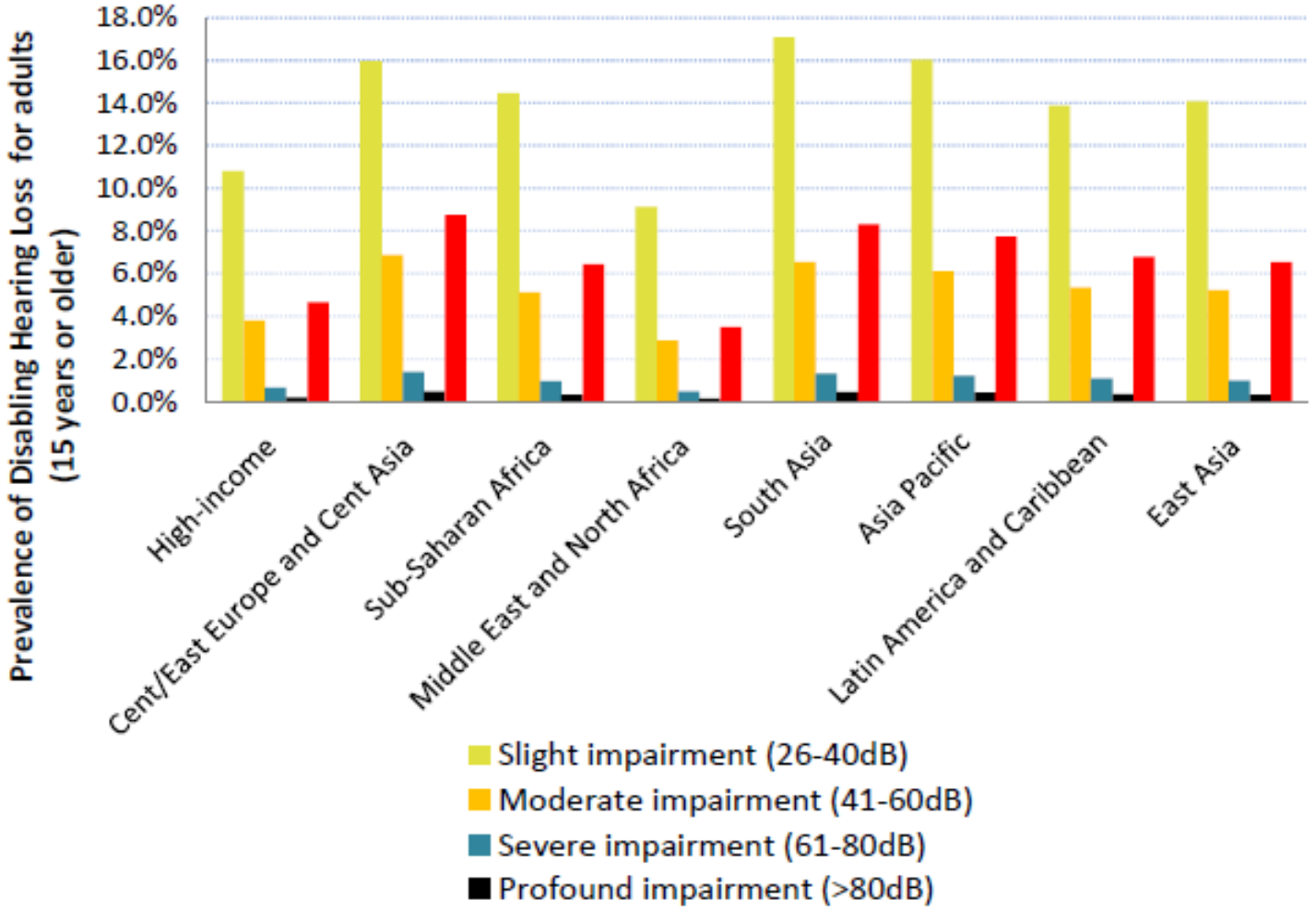
Mild hearing loss

Degree of hearing loss	Hearing loss range (dB HL)
Normal	–10 to 15
Slight	16 to 25
Mild	26 to 40
Moderate	41 to 55
Moderately severe	56 to 70
Severe	71 to 90
Profound	91+

Source: Clark, J. G. (1981). Uses and abuses of hearing loss classification. *Asha, 23*, 493–500.



Prevalence of mild hearing loss



* MBD, WHO, 2011 DHL estimates, where DHL adult threshold is ≥41 dB.

Hearing instrument penetration

Hearing instrument penetration

Hearing aid adoption rates distributed on hearing loss severity for selected countries

	Mild	Moderate	Severe	Profound
Germany	8 %	22 %	58 %	70 %
United Kingdom	14 %	42 %	73 %	
France	9 %	28 %	45 %	51 %
USA	6 %	27 %	55 %	38 %

Source: EuroTrak I, 2011 & MarkeTrak VIII, 2008.

Hearing instrument penetration

Wishes and Needs Tool (WANT)

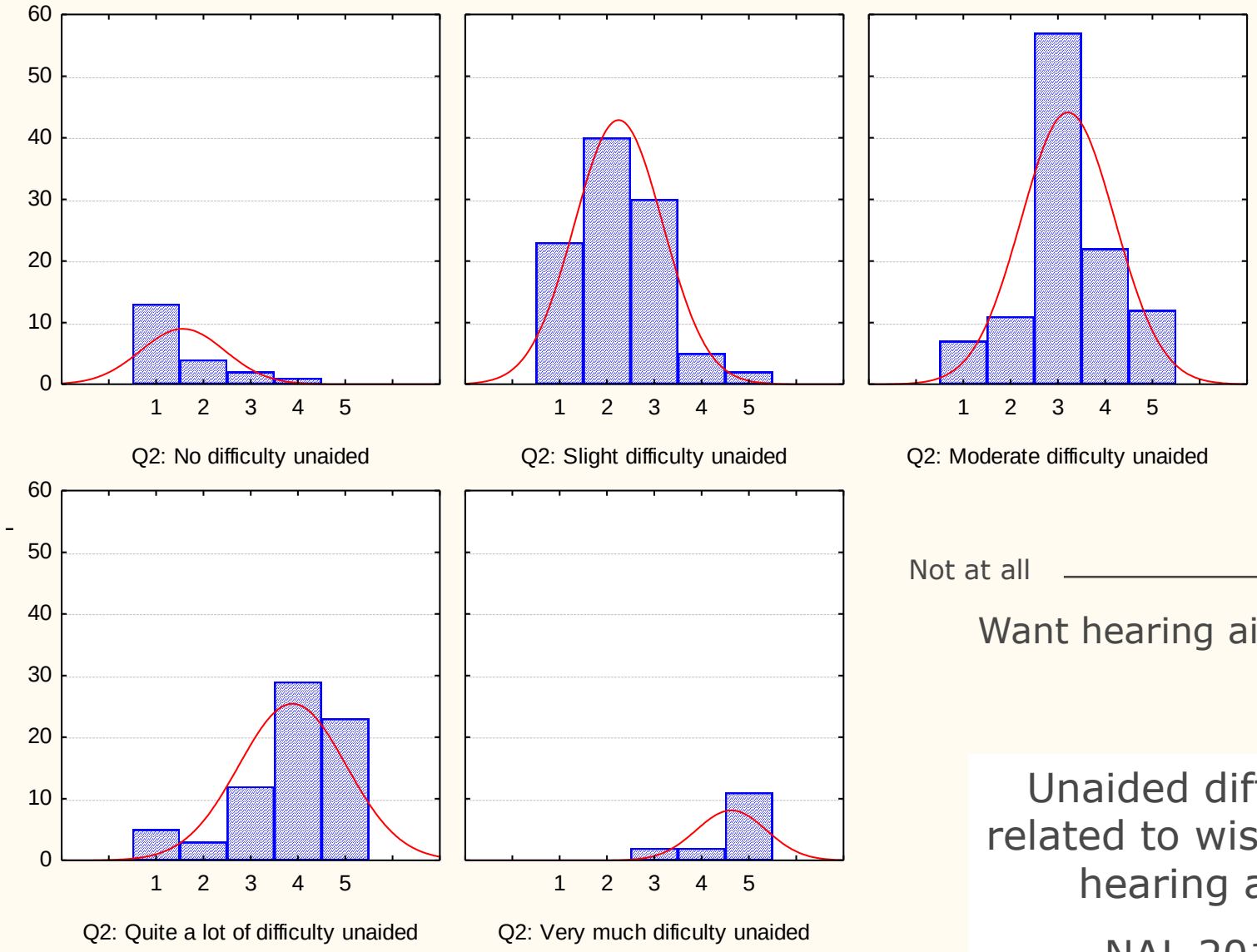
- How strongly did you want to get hearing aids?

  - ☐ *Wanted it very much*
  - ☐ *Wanted it quite a lot*
  - ☐ *Wanted it moderately*
  - ☐ *Wanted it slightly*
  - ☐ *Did not want it*

- Overall how much difficulty do you have hearing, when not wearing your hearing aids?

  - ☐ *Very much difficulty*
  - ☐ *Quite a lot of difficulty*
  - ☐ *Moderate difficulty*
  - ☐ *Slight difficulty*
  - ☐ *No difficulty*

Hearing instrument penetration



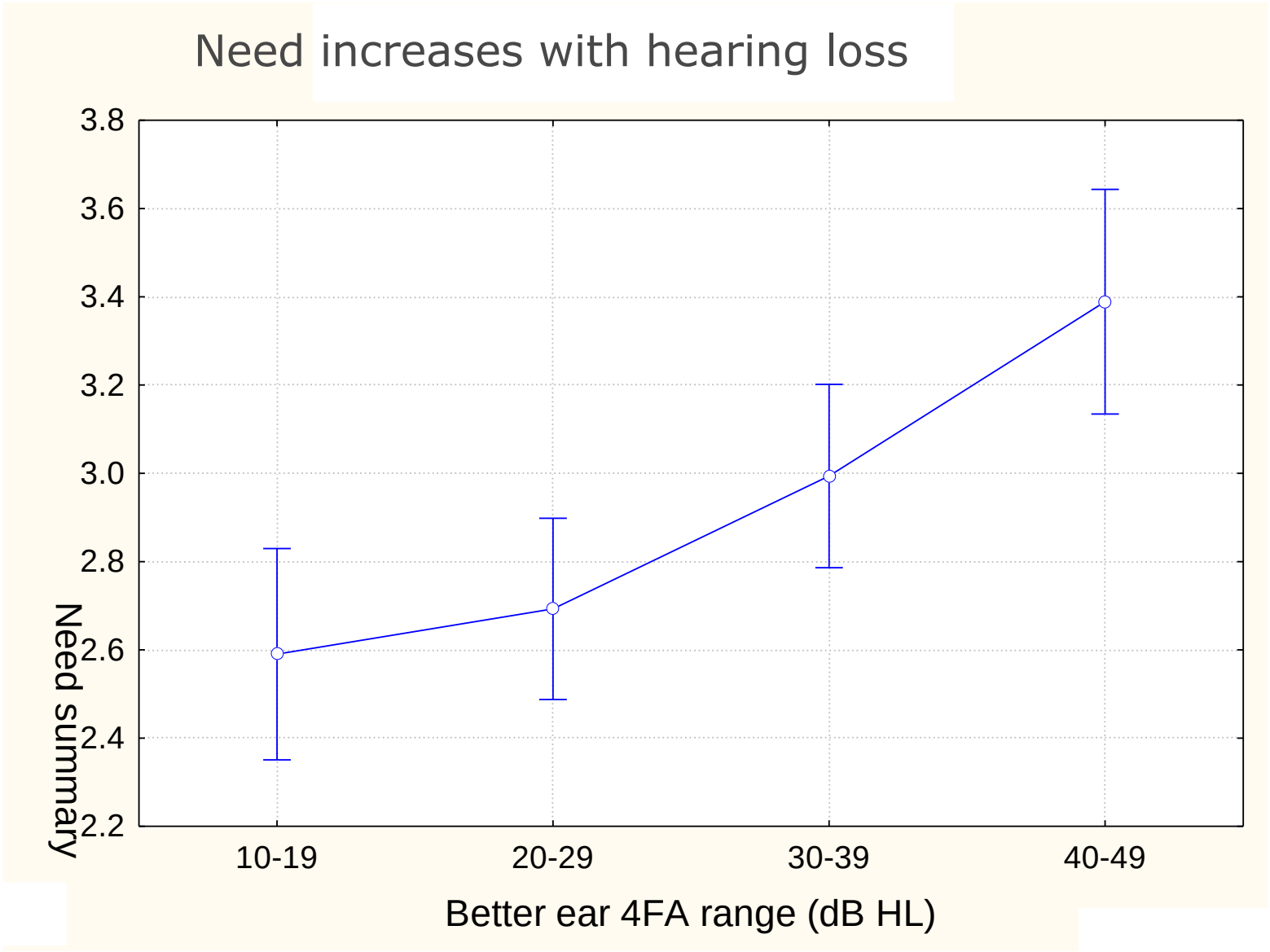
Not at all → Very much

Want hearing aids

Unaided difficulty related to wish to get hearing aids

NAL 2010

Hearing instrument penetration



Hearing instrument penetration

Why don’t more people with mild hearing loss use hearing instruments?

- Practical reasons

Hearing instrument penetration

Why don’t more people with mild hearing loss use hearing instruments?

- Psychological reasons

Hearing instrument penetration

Why don’t more people with mild hearing loss use hearing instruments?

- Social reasons

Hearing instrument penetration

Why don't more people with mild hearing loss use hearing instruments?

- Practical reasons
- Psychological reasons
- Social reasons

Expectation management

Expectation management

ABBREVIATED PROFILE OF HEARING AID BENEFIT

FORM A

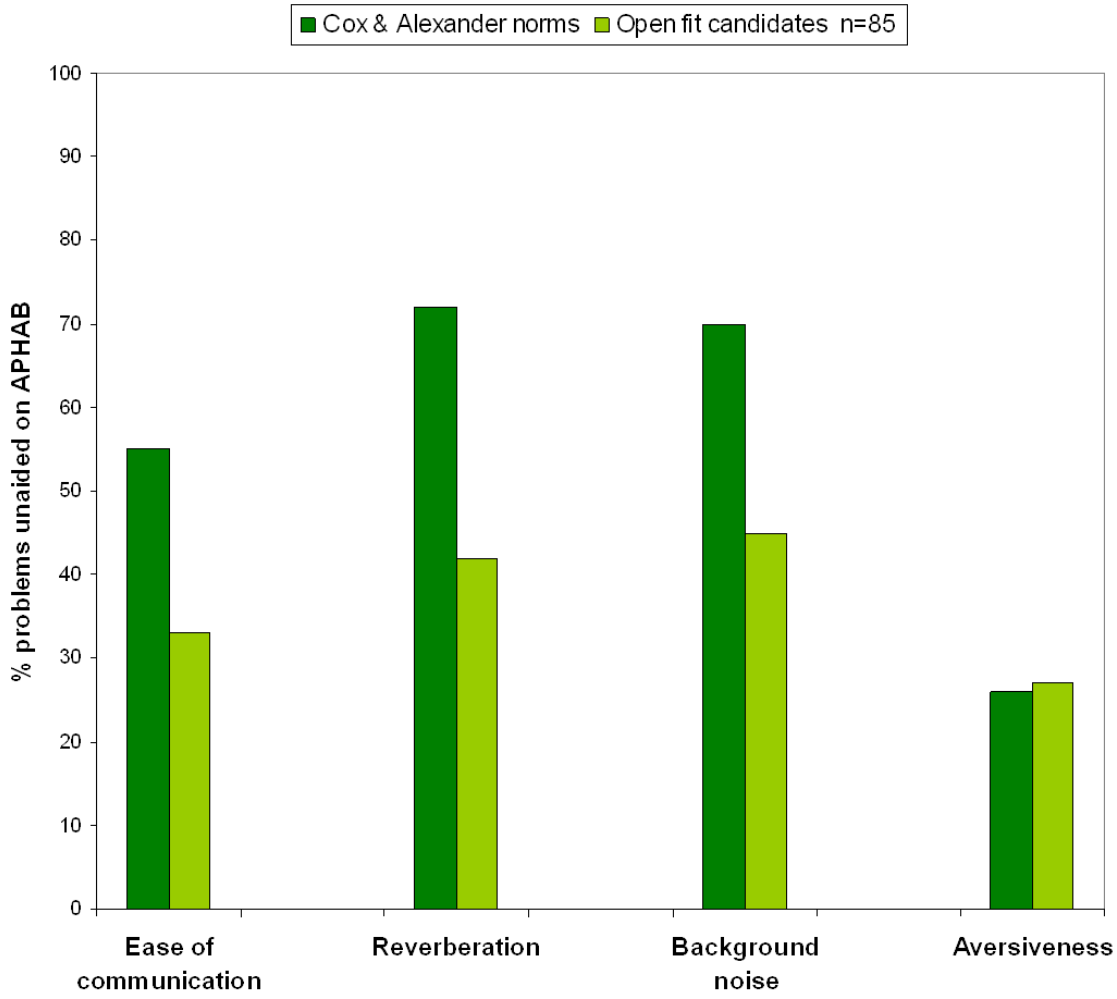
INSTRUCTIONS:

Please circle the answers that come closest to your everyday experience. Notice that each choice includes a percentage. You can use this to help you decide on your answer. For example, if the statement is true about 75% of the time, circle C for that item. If you have not experienced the situation we describe, try to think of a similar situation that you have been in and respond for that situation. If you have no idea, leave that item blank.

A	Always (99%)
B	Almost Always (87%)
C	Generally (75%)
D	Half-the-time (50%)
E	Occasionally (25%)
F	Seldom (12%)
G	Never (1%)

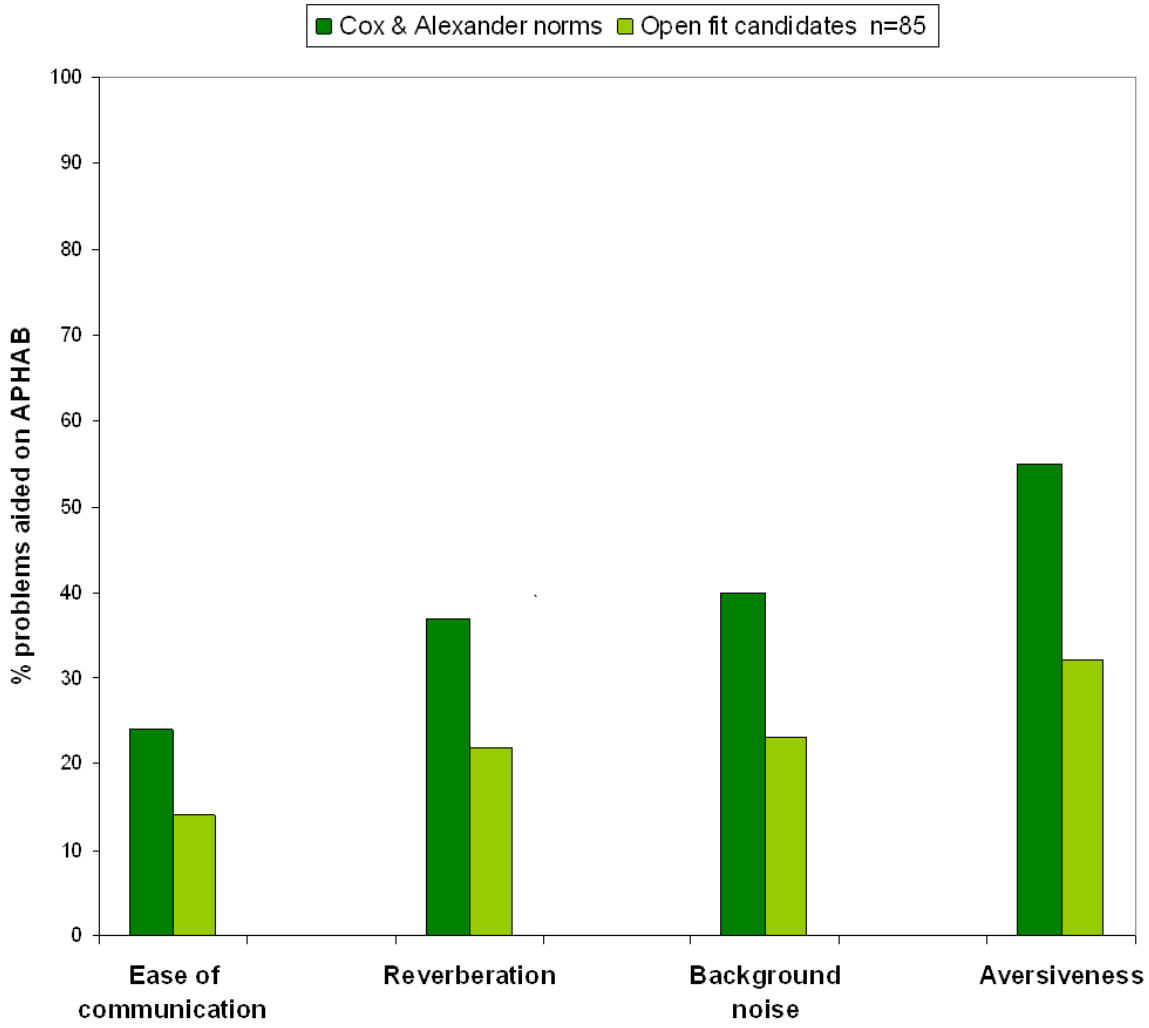
		Without Hearing Aids	With Hearing Aids
1.	When I am in a crowded grocery store, talking with the cashier, I can follow the conversation.	A B C D E F G	A B C D E F G
2.	I miss a lot of information when I'm listening to a lecture.	A B C D E F G	A B C D E F G
3.	Unexpected sounds, like a smoke detector or alarm bell are uncomfortable.	A B C D E F G	A B C D E F G
4.	I have difficulty hearing a conversation when I'm with one of my family at home.	A B C D E F G	A B C D E F G
5.	I have trouble understanding the dialogue in a movie or at the theater.	A B C D E F G	A B C D E F G
6.	When I am listening to the news on the car radio, and family members are talking, I have trouble hearing the news.	A B C D E F G	A B C D E F G
7.	When I'm at the dinner table with several people, and am trying to have a conversation with one person, understanding speech is difficult.	A B C D E F G	A B C D E F G
8.	Traffic noises are too loud.	A B C D E F G	A B C D E F G
9.	When I am talking with someone across a large empty room, I understand the words.	A B C D E F G	A B C D E F G
10.	When I am in a small office, interviewing or answering questions, I have difficulty following the conversation.	A B C D E F G	A B C D E F G

Expectation management

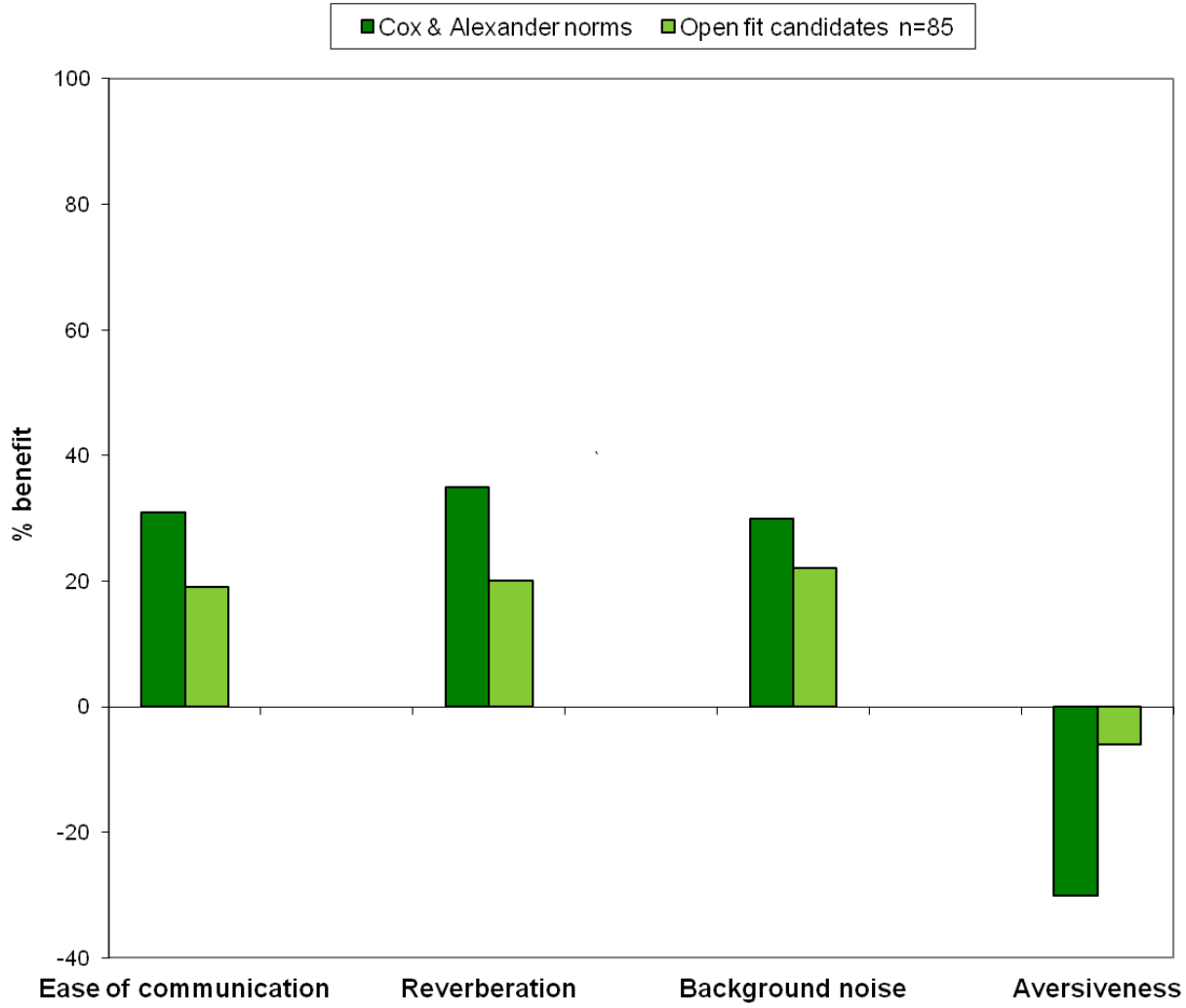


(Mecklenburger & Joergensen 2009)

Expectation management



Expectation management



Expectation management

Dual responsibilities:

- Who are motivated
- Set realistic expectations
- Ensure beneficial ”treatment”

- Counselling of those not yet motivated

Tools for communication

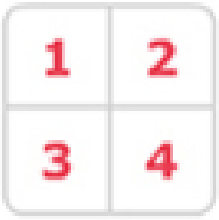
Motivation is key to positive outcomes.

Motivation tools

http://idainstitute.com/tool_room/motivation_tools/#/tool_room/motivation_tools/motivation_tools/?type=1337

- The line

- The box



Tools for communication

The line

1

How important is it for you to improve your hearing right now?

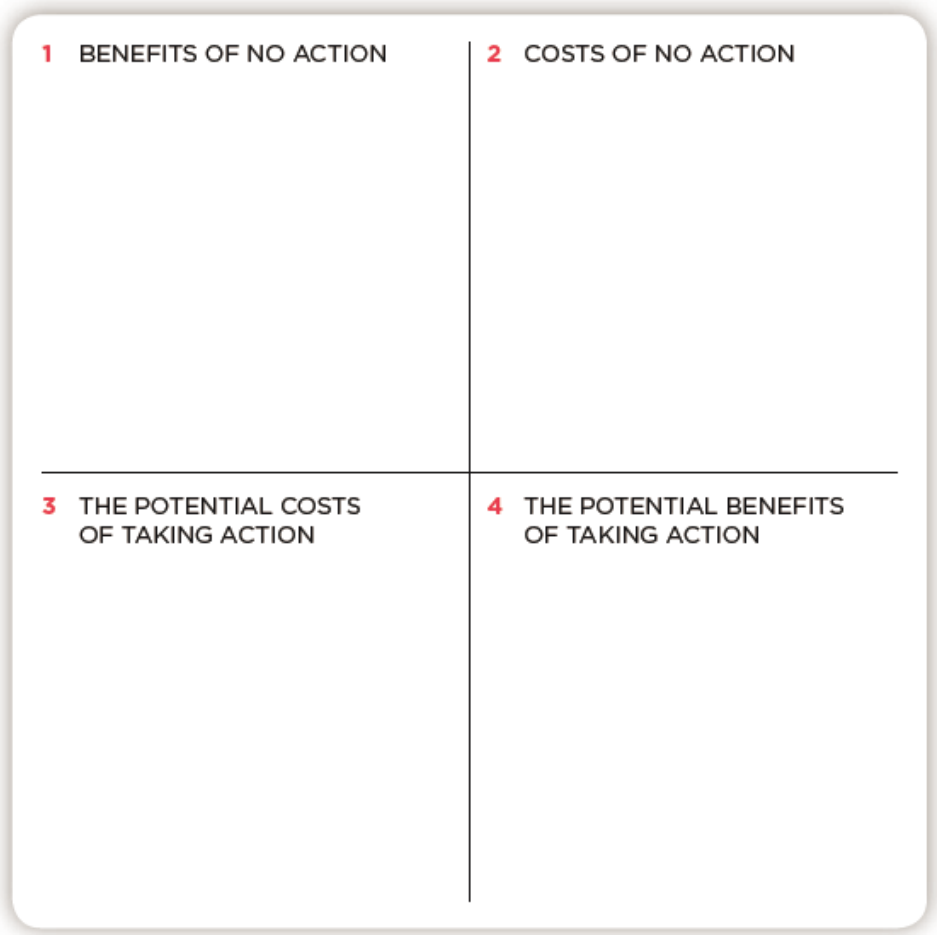
2

How much do you believe in your ability to use...*

The lines go from: *0 = not at all* to *10 = very much*.

Tools for communication

The box



Expectation management

National Acoustic Laboratories
A division of Australian Hearing

NAL
CLIENT ORIENTED SCALE OF IMPROVEMENT

Name : _____ **Category.** **New** _____
Audiologist : _____ **Return** _____
Date : **1. Needs Established** _____
2. Outcome Assessed _____

SPECIFIC NEEDS

Indicate Order of Significance

☐ _____
_____

☐ _____
_____

☐ _____
_____

☐ _____
_____

☐ _____
_____

Degree of Change

Worse	No Difference	Slightly Better	Better	Much Better	CATEGORY

Final Ability (with hearing aid)
Person can hear

10%	25%	50%	75%	95%
Hardly Ever	Occasionally	Half the Time	Most of Time	Almost Always

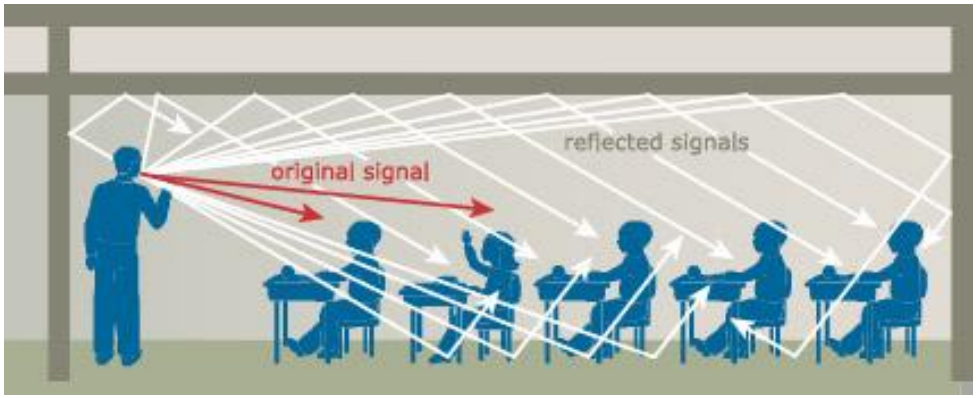
Categories

1. Conversation with 1 or 2 in quiet
2. Conversation with 1 or 2 in noise
3. Conversation with group in quiet
4. Conversation with group in noise
5. Television/Radio @ normal volume
6. Familiar speaker on phone
7. Unfamiliar speaker on phone
8. Hearing phone ring from another room
9. Hear front door bell or knock
10. Hear traffic
11. Increased social contact
12. Feel embarrassed or stupid
13. Feeling left out
14. Feeling upset or angry
15. Church or meeting
16. Other

Communication strategies

Communication strategies

What is a good listening environment?



Communication strategies

What can the surroundings do?

- Use gestures and natural hand signs
- Make sure you have the attention before talking

Communication strategies

What can the hearing impaired do?

- Facilitate communication
- Be specific when asking for repetition

Communication strategies

- Communication strategies can be used as part of the hearing aid rehabilitation to improve benefit.

  It helps the user taking responsibility of rehabilitation which increases likelyhood of success.

- Communication strategies can be used as a stand alone rehabilitation until acceptance of hearing impairment and motivation for amplification is present

Mild hearing loss solutions

Mild hearing loss solutions

Instant fit solutions

Mild hearing loss solutions

Instant fit solutions

Advantages

- No impression
- Very discreet on the ear (some)
- No or less occlusion
- Good with glasses

Disadvantages

- No directionality
- No accessories option
- Might not be a good fit for everyone
- Risk of retention problems
- Damage due to wax and moisture
- No control buttons

What can be difficult, when fitting this type of device?

- Feedback problems due to fit.
- Chose the right end user for this type of hearing aid
- Appearance on the ear

Mild hearing loss solutions

IIC & CIC

Completely in the canal

Mild hearing loss solutions

IIC & CIC

Advantages

- Very discreet on the ear
- Close to normal ear acoustics
- Good with glasses
- Accessories
- Less wind noise

Disadvantages

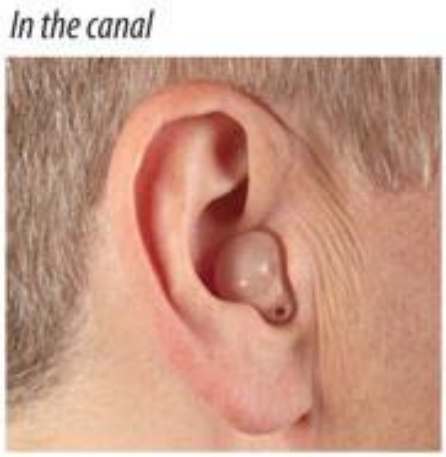
- Risk of occlusion
- Waiting time due to manufacturing
- Impression needed
- Risk of acoustic feedback
- Damage due to wax and moisture
- No control buttons
- No directionality

What can be difficult, when fitting this type of device?

- Making the deep impression
- Getting a good seal in the right place of the ear canal so no occlusion effect
- Insertion and removal

Mild hearing loss solutions

ITC, ITE, Remote microphone HI



Mild hearing loss solutions

ITC, ITE, Remote microphone HI

Advantages

- Close to normal ear acoustics
- Directional microphone available
- Good with glasses
- Accessories

Disadvantages

- When you order an ITC, sometimes you get an ITE due to ear size or impression size
- High risk of occlusion
- Waiting time due to manufacturing
- Impression needed
- Risk of acoustic feedback
- Damage due to wax and moisture
- Small control buttons

What can be difficult, when fitting this type of device?

- Avoiding occlusion effect
- Insertion and removal
- Handling the controls, in general

Mild hearing loss solutions

MBTE & BTE open fitting

Mild hearing loss solutions

MBTE & BTE open fitting

Advantages

- Very discreet on the ear
- Fits comfortably in most ears
- No occlusion, open fitting
- Transitional; can go from open to more closed fittings with same device
- Directionality
- Accessories option
- Good for even very narrow ear canals
- Cost of thin tube vs. receiver

Disadvantages

- Microphone positioned behind the ear
- When wearing glasses

What can be difficult, when fitting this type of device?

- Insertion

Mild hearing loss solutions

RIE

Mild hearing loss solutions

RIE

Advantages

- Size (rec. not in casing)
- Very discreet on the ear
- Fits comfortably in most ears
- No occlusion, open fitting
- Transitional; can go from open to more closed fittings with same device
- Directionality
- Accessories option

Disadvantages

- Microphone positioned behind the ear
- When wearing glasses
- The receiver sits in the ear canal and might be affected by ear wax and moisture
- The receiver makes the part that sits in the ear canal a bit bigger than on a RITA device
- Cost of receiver vs. thin tube

What can be difficult, when fitting this type of device?

- Receiver noise if very good LF hearing
- Insertion

Mild hearing loss solutions

BTE with custom ear mold

Mild hearing loss solutions

BTE with custom ear mold

Advantages

- Fits comfortably due to individual mold
- Mold can be different material
- Directionality
- Greater amplification
- Button size
- Accessories option
- Large battery
- Good retention

Disadvantages

- Size
- Risk of occlusion
- Microphone positioned behind the ear
- Waiting time due to manufacturing
- When wearing glasses

What can be difficult, when fitting this type of device?

- Avoiding occlusion
- Acceptance of a large device and more occluded ear canal

Mild hearing loss solutions

Is there a best way to fit people with mild hearing loss?

Fitting rationales:

- Some manufacturers offer a proprietary first time fitting rationale that provides less initial gain.
- In general new hearing aid users does not accept the devices, if they have too much high frequency gain.

Mild hearing loss solutions

Is there a best way to fit people with mild hearing loss?

Features in the hearing instrument:

- Feedback management
- Directionality options
- Noise reduction

Mild hearing loss solutions

Is there a way to best counsel people with mild HL?

Counselling:

- How much hearing aid wear time?
- Which situations to use hearing aids?

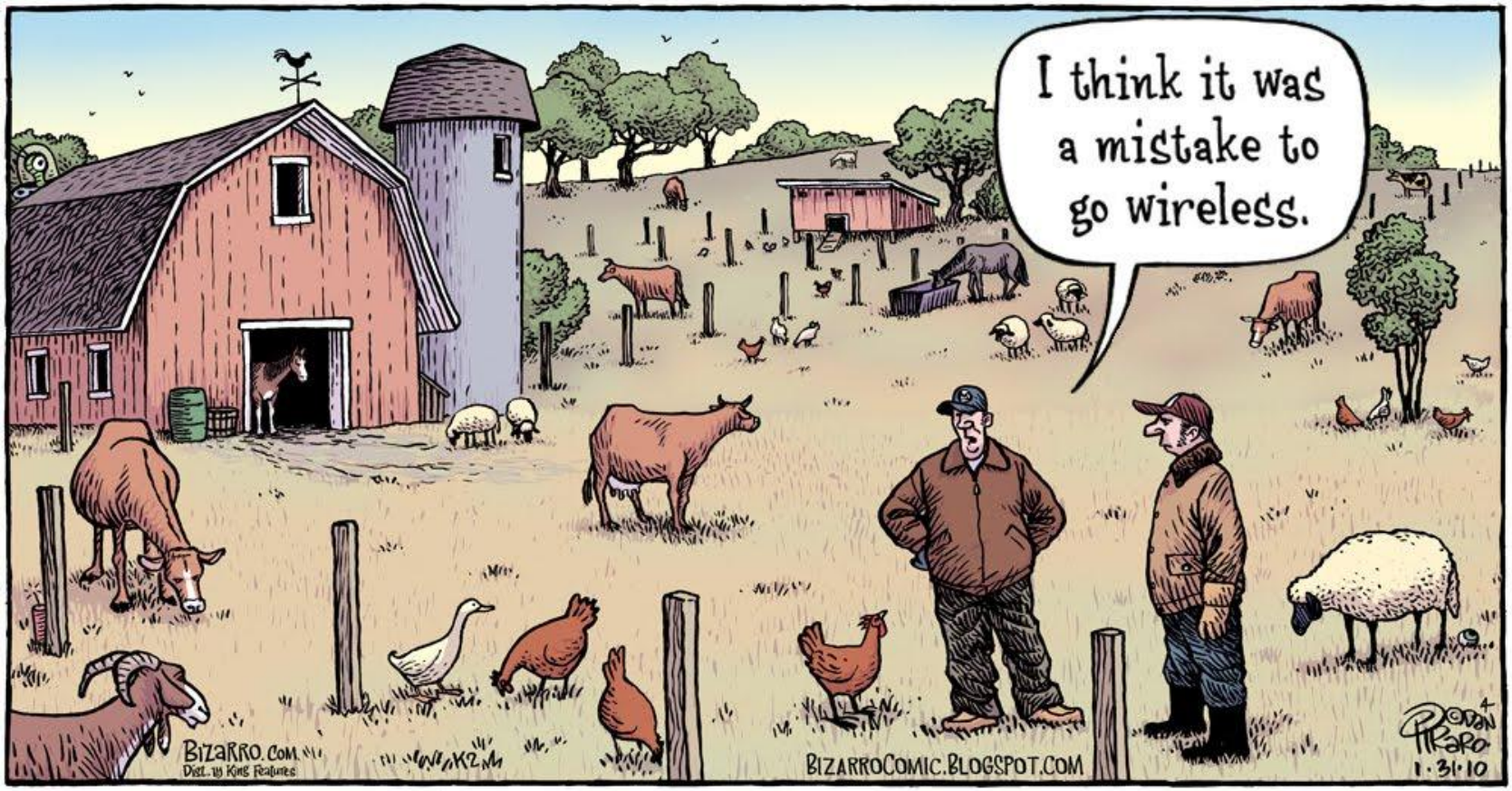
Mild hearing loss solutions

Is there a best way to fit people with asymmetric hearing loss, where one ear has a mild hearing loss and the other ear a more severe hearing loss?

- Study showed a slight tendency to prefer an open fitting on the ear with a mild hearing loss
- Showed preference for the fitting that gave the best speech in noise score

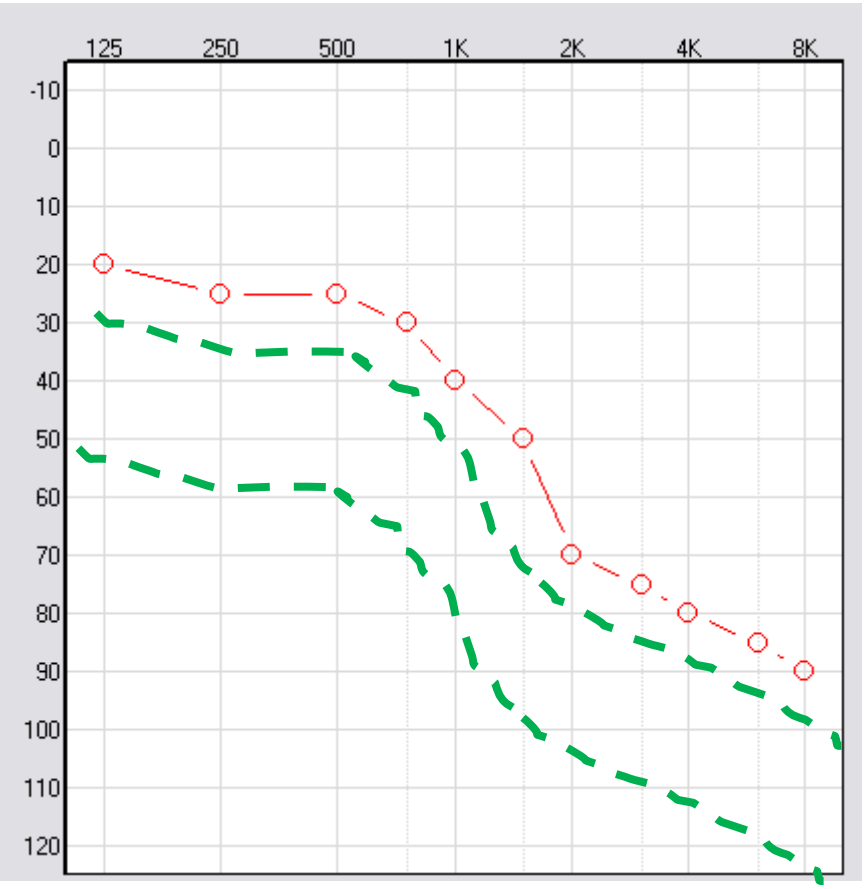
Mild hearing loss solutions and accessories

Who are candidates for wireless accessories?

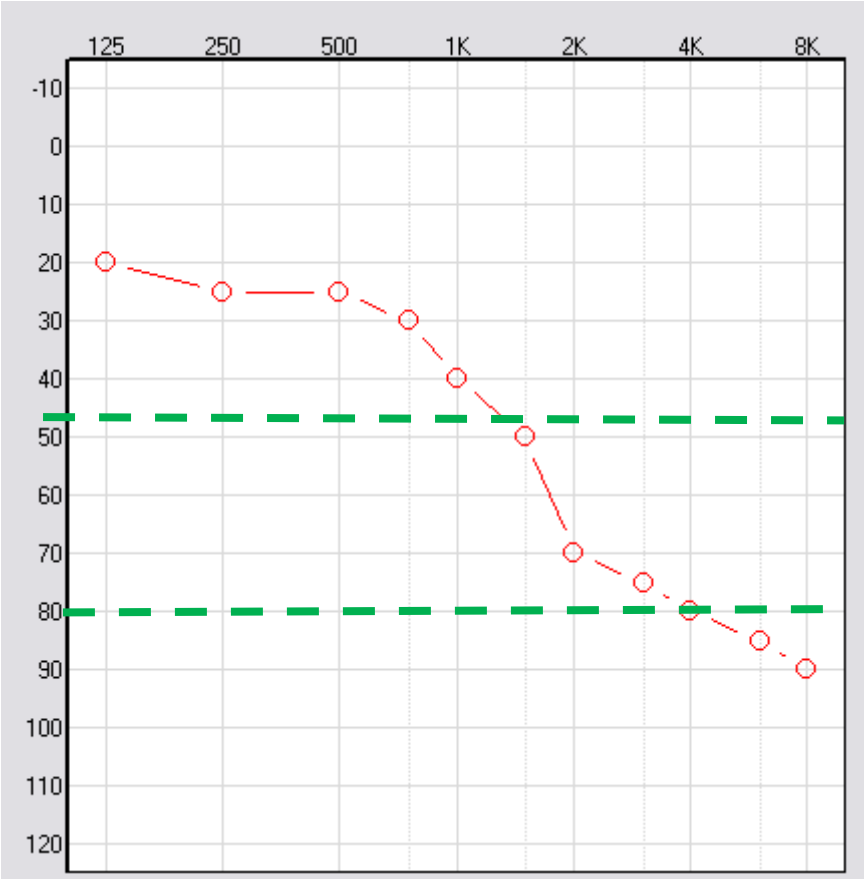


When are wireless accessories beneficial?

TV streamer



TV



When are wireless accessories beneficial?

- Who would benefit from using the TV Streamer?
  - Any end user struggling to understand what is being said without closed caption activated on their TV set.
  - Any user who enjoys listening to music and lacks fidelity with the hearing instruments alone
  - TV streamer might be like using a sledgehammer to crack a nut for mild hearing losses (hearing aids only as a start).



When are wireless accessories beneficial?

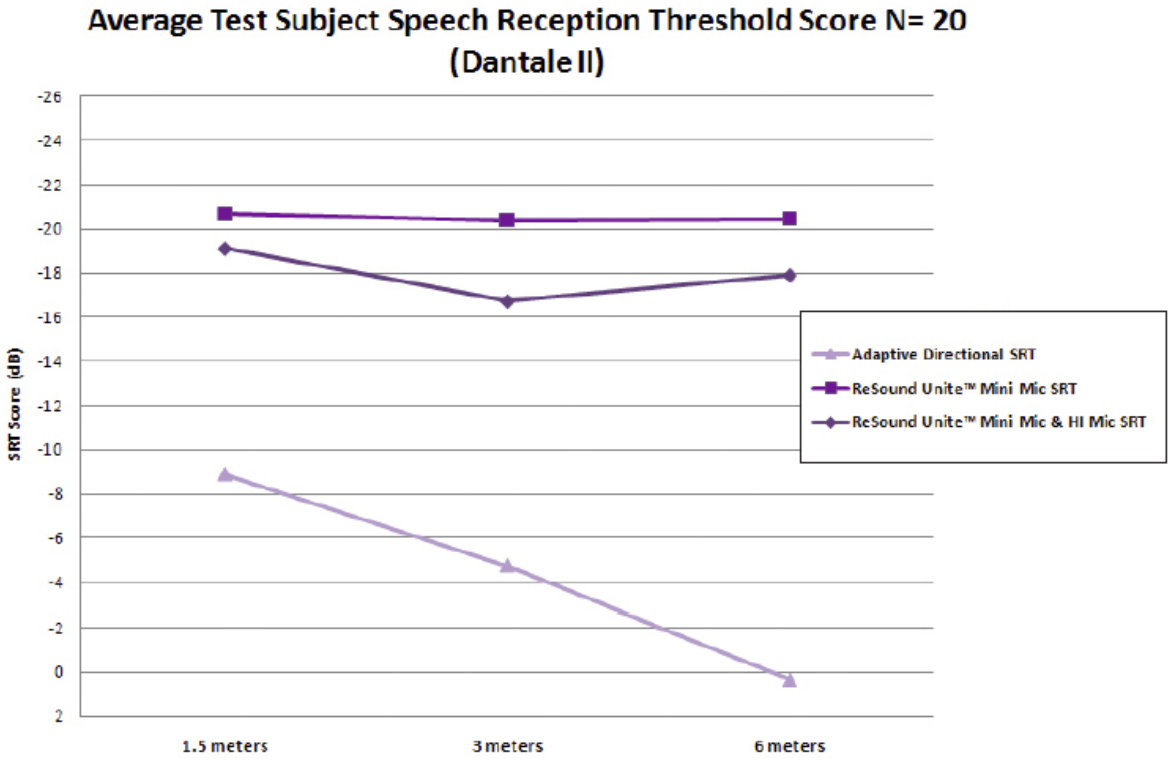
External Microphone

- An external microphone tackles the problem of listening to speech signals in the presence of background noise, at a distance and/or in the presence of reverberation.

- The external microphone picks up the signal of interest at the location where the best signal-to-noise-ratio is present, close to the mouth of the speaker.

When are wireless accessories beneficial?

Improvements in speech understanding in noise over those observed with directionality increase further when the signal of interest is at a distance from the listener.



When are wireless accessories beneficial?

- Who would benefit from using an external microphone?
  - Any end user who attends talks, seminars or church services where the speaker is at a distance and/or in reverberant surroundings and report problems hearing with hearing aids alone.
  - Any end user who would like the option to stream music or audio books to their hearing instruments from a portable source
    - For example, while exercising or using public transport
  - Any user who needs sound enrichment to combat troublesome tinnitus
    - Any sound can be streamed to the hearing instruments, from pink noise to the sound of a thunder storm

When are wireless accessories beneficial?

- The inability to communicate on the phone has been linked at a statistically significant level to a perceived reduction in the quality of life of hearing-impaired individuals

  Dalton, D.S., et al., *The impact of hearing loss on quality of life in older adults.* Gerontologist, 2003. 43(5): p. 661-8.

- Failure to use hearing instruments with the phone is reported as one of the main reasons why hearing instrument owners do not use their hearing instruments

  Kochkin, S., *MarkeTrak V: "Why my hearing aids are in the drawer": The consumer's perspective.* The Hearing Journal, 2000. 53(2): p. 34-41.

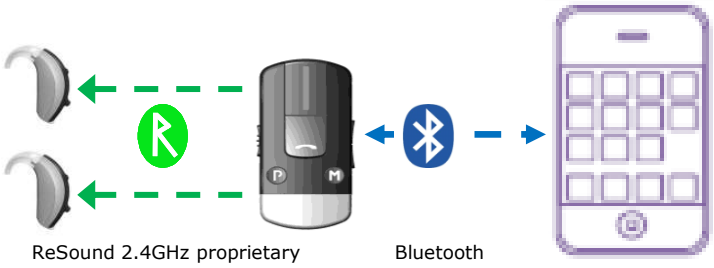
When are wireless accessories beneficial?

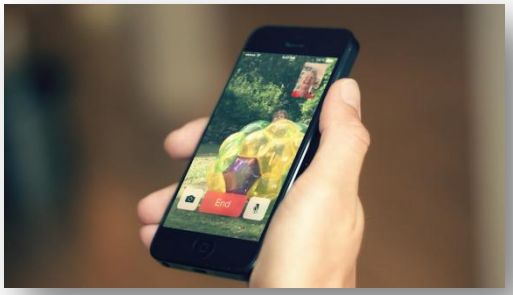
- Picou and Ricketts found a significant benefit when speech was transmitted bilaterally in the presence of several different noise configurations. This benefit was attributed to binaural summation and binaural squelch.

Picou, E.M. and T.A. Ricketts, *Comparison of wireless and acoustic hearing aid-based telephone listening strategies.* Ear Hear, 2011. 32(2): p. 209-20.

When are wireless accessories beneficial?

- Conversations streamed from the phone offers the benefit of bilateral transmission, thereby improving the end user experienced speech understanding and benefit on the phone





When are wireless accessories beneficial?

- Who would benefit from using a phone streamer or Made for iPhone hearing instruments?

  - Any end user with a Bluetooth enabled phone (Phone streamer) or iPhone 5/5C/5S (Mfi) who experiences difficulty understanding speech on the phone when using other methods (unaided, aided, acoustic phone program or telecoil)
  - Phone streamer: Any end user interested in hands-free telephony.

Common fitting errors when fitting mild hearing losses

Common errors

Error could be thinking that the hearing loss is so mild that the client will not get any benefit of amplification.

Common errors

Error could also be thinking that any degree of hearing loss, even the mildest ones, will always need amplification in any situation.

Common errors

Thinking that there can be no directional benefit for open fittings

Directional Benefit

Directional characteristics are influenced by the following factors:

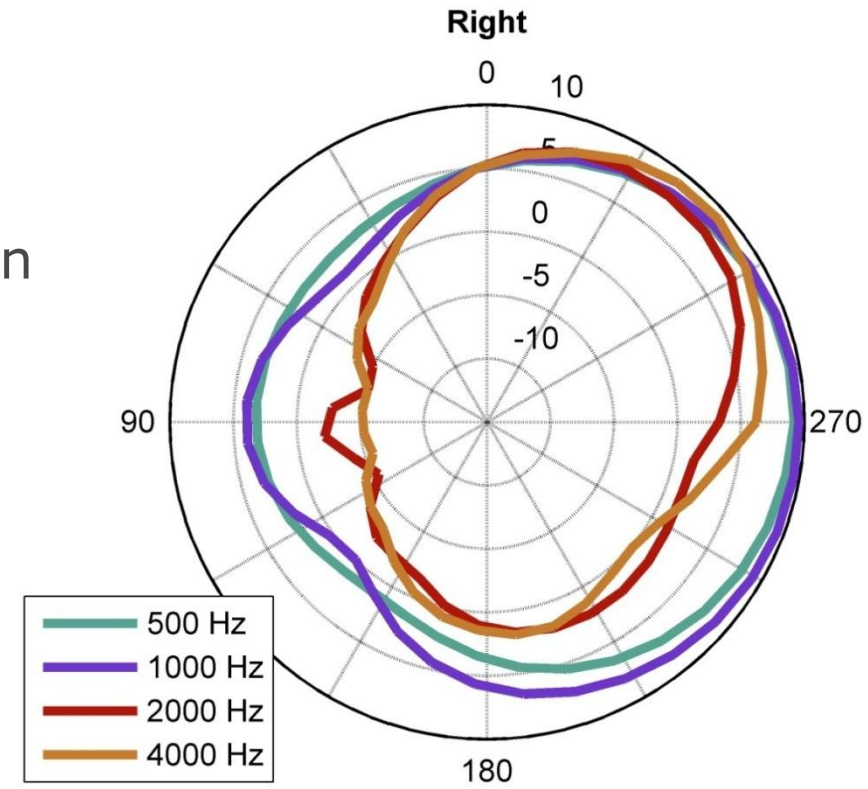
- Angle of arrival for signal of interest
- Microphone spacing on hearing instrument
- Microphone match

Environmental factors

- Spatial separation of signal of interest and noise

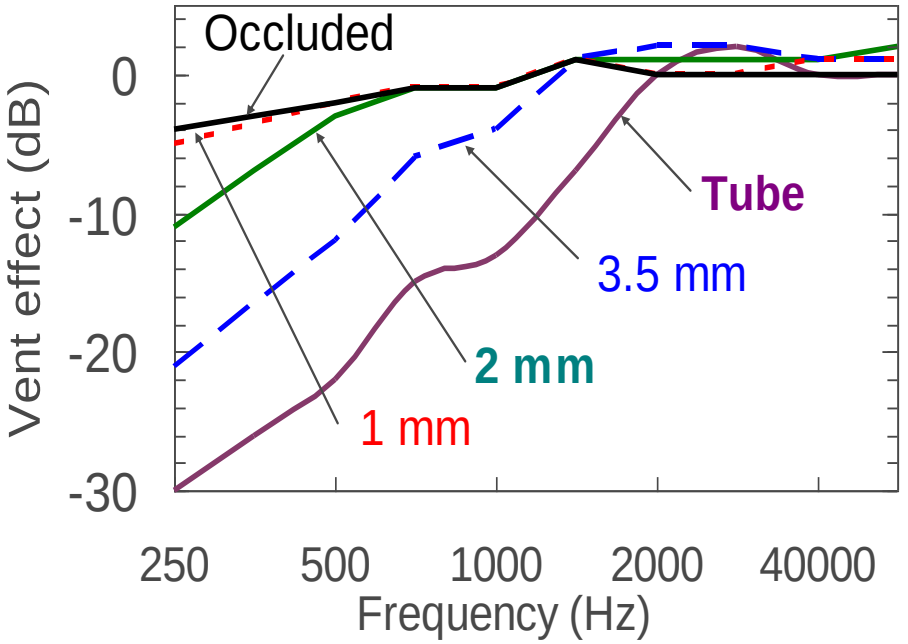
Directional Benefit

- Sound travels around the head
- Most impact in high frequencies
- Low frequencies have more of an omni-directional response



Directional Benefit

- Venting attenuates low frequency energy in the ear canal
- The size of the vent affects the size of attenuated frequency region
- Open fittings have largest frequency range of vent attenuation



(Dillon, 2012)

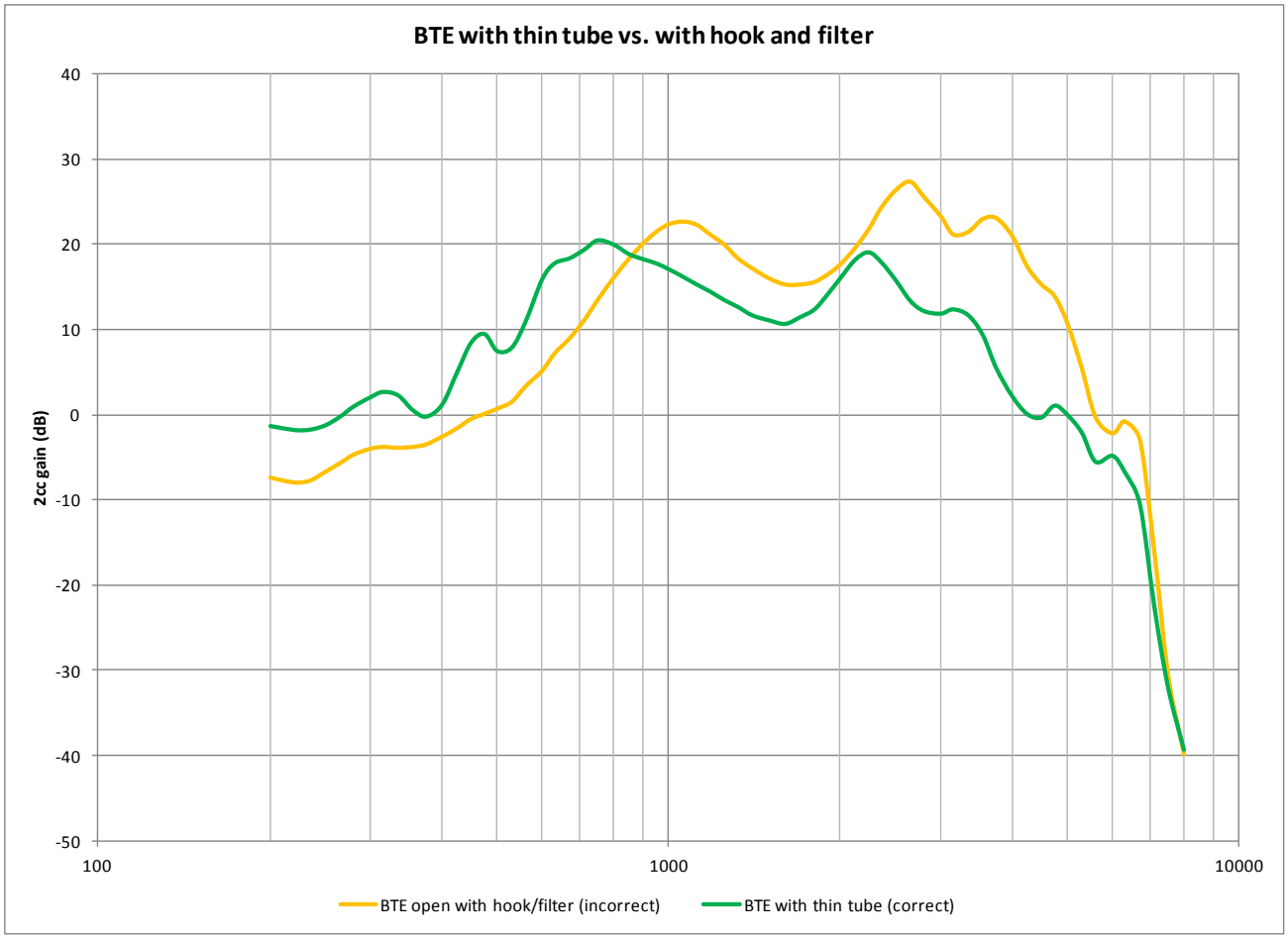
Directional Benefit

Average hearing aid wearers will receive a directional advantage in cases in which:

- The sound source of interest is in front and near
- Competing noise is mainly behind or surrounds the listener
- Reverberation is moderate or less

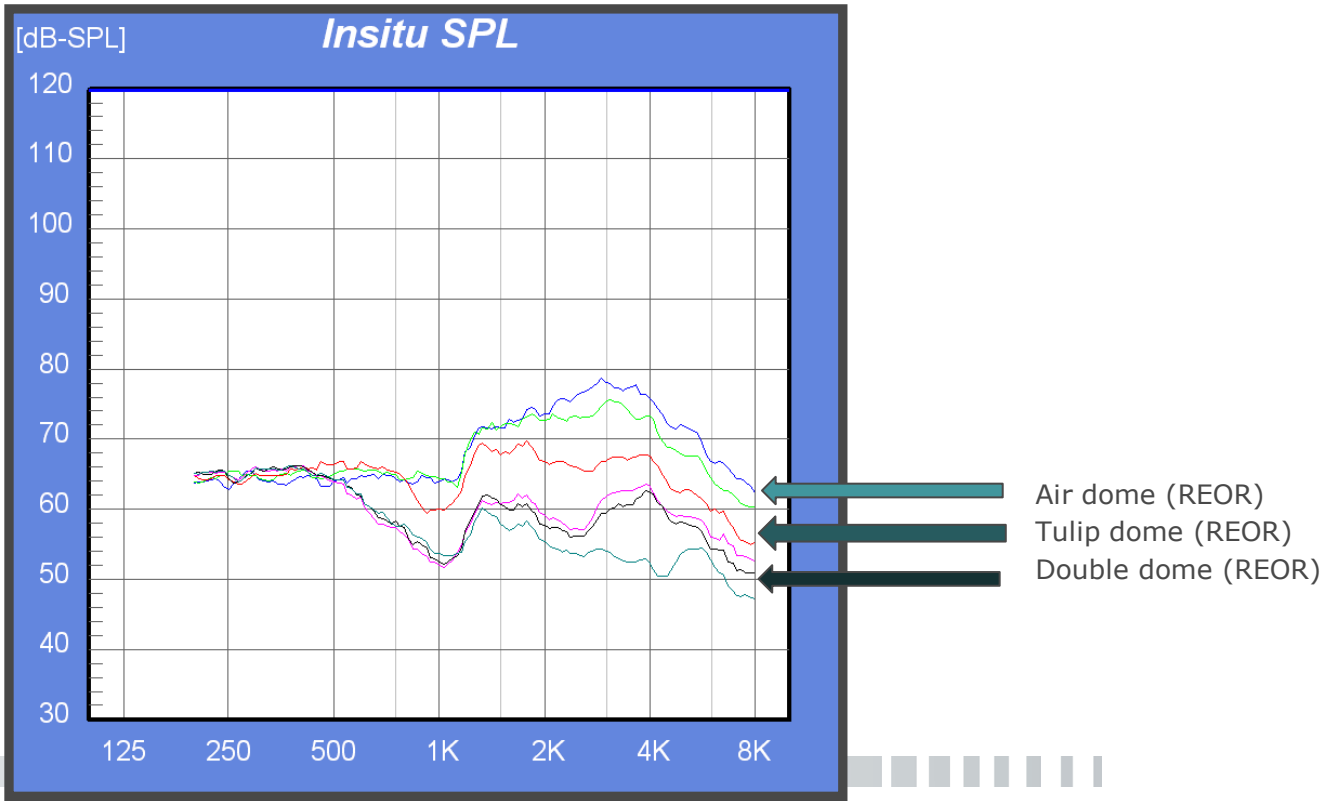
Common errors

Configuring errors



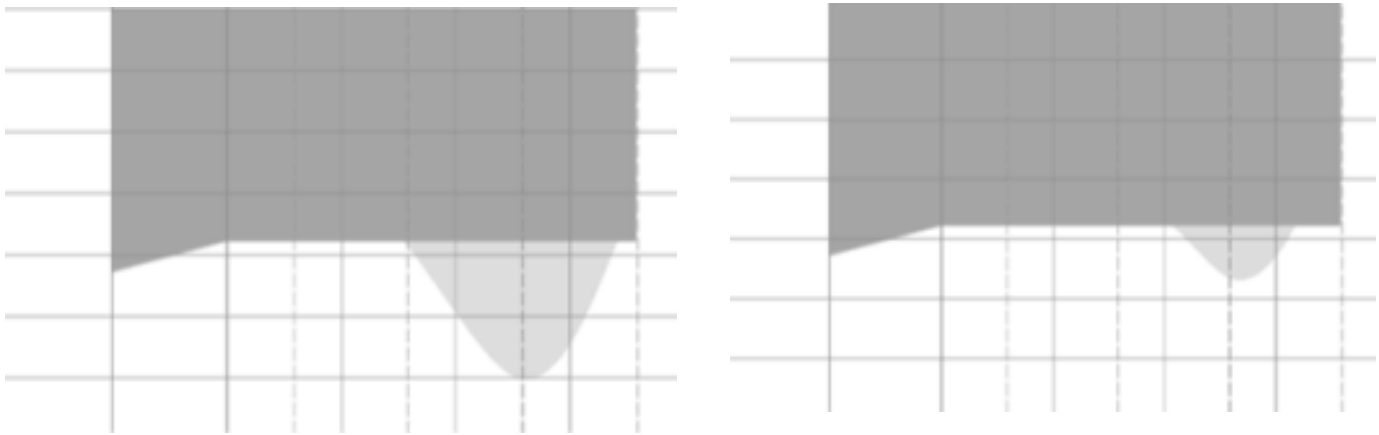
Common errors

In order for most feedback management solutions to function optimally it is necessary with a calibration with the final physical features in place



Common errors

Maximum stable gain resulting from DFS calibrations performed using an air dome (left) and a tulip dome (right)



Common errors

Thinking that a hearing aid is the full solution

Q & A