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  - Open PDF in Preview
  - Click File
  - Click Print
  - Click dropdown menu on the right “preview”
  - Click layout
- Choose # of pages per sheet from dropdown menu
- Checkmark Black & White if wanted.
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Oticon CROS

A revolutionary sound experience

Maegan Mapes, Au.D
Education & Training Specialist

oticon
life-changing technology

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Learning Objectives

Participants will be able to:

- describe the acoustic limitations of individuals with single-sided deafness
- describe how an unprecedented signal processing technology can provide better conditions for speech understanding and localization
- identify the full portfolio of devices available to support Oticon CROS
- list the steps to setup and program Oticon CROS

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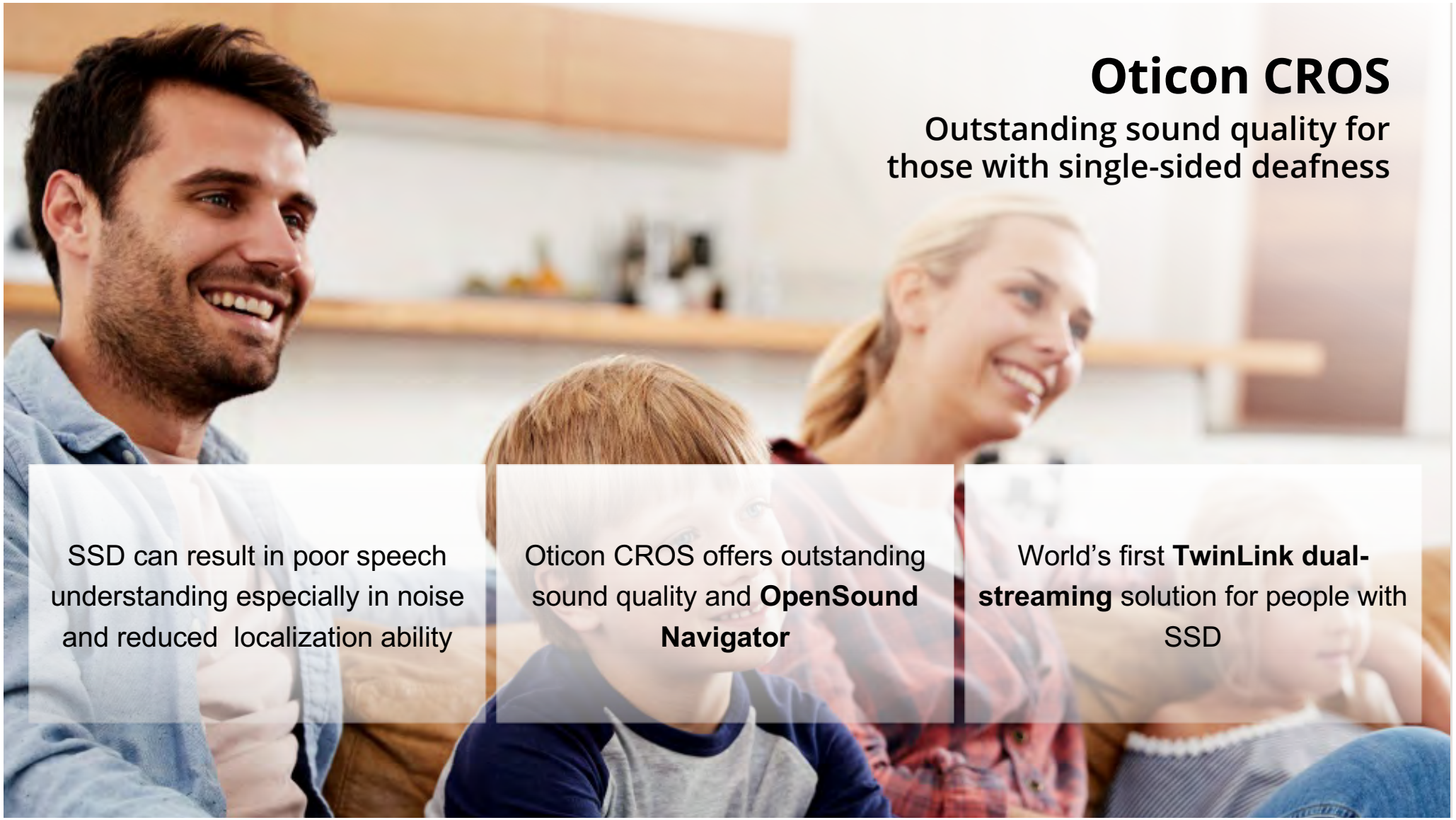

Oticon CROS

Outstanding sound quality for those with single-sided deafness

SSD can result in poor speech understanding especially in noise and reduced localization ability

Oticon CROS offers outstanding sound quality and **OpenSound Navigator**

World's first **TwinLink dual-streaming** solution for people with SSD

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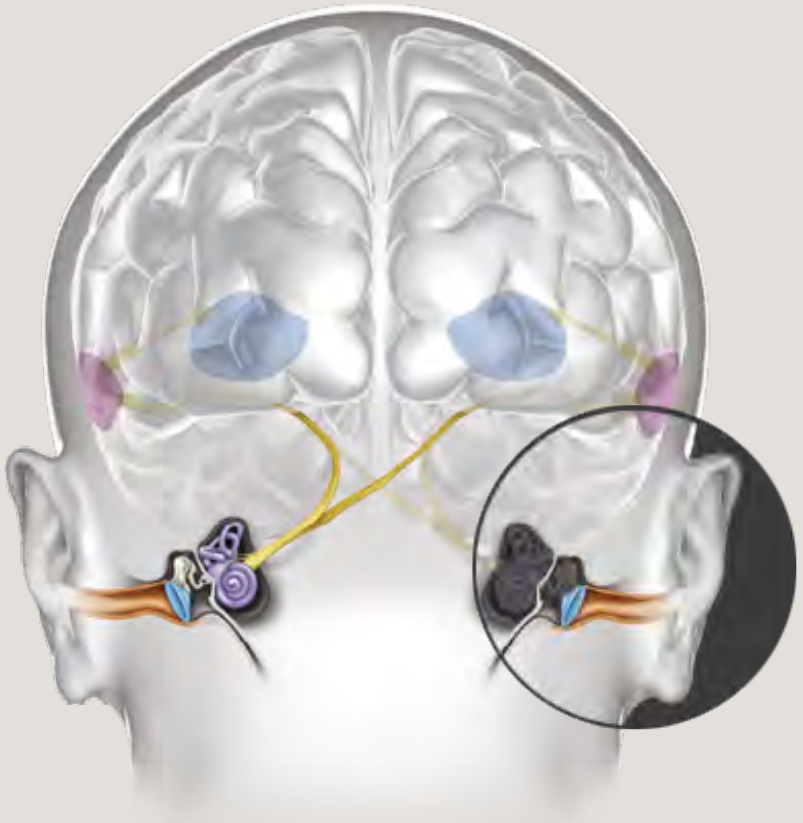
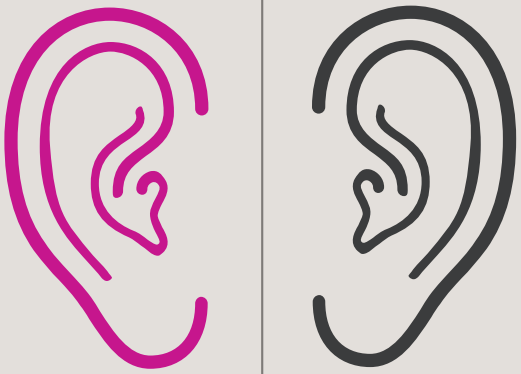
Background on SSD



How many of you…

…have seen a client with single-sided deafness?



…in your mind, what constitutes single-sided deafness?

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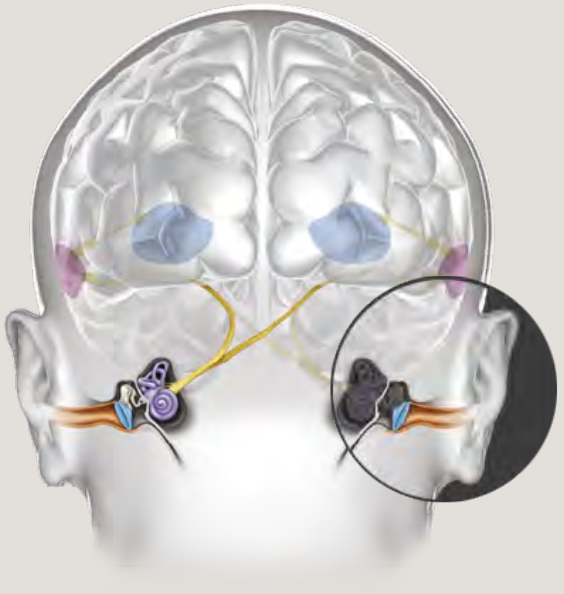
What is single-sided deafness?

" *...single-sided deafness (SSD) is defined as* ***unaidable hearing in one ear and normal hearing or an aidable hearing loss in the other ear*** "



Taylor 2010

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Do you know...

…how many suffer from SSD?

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Every year…

60,000
USA

≈ 1% of the general population

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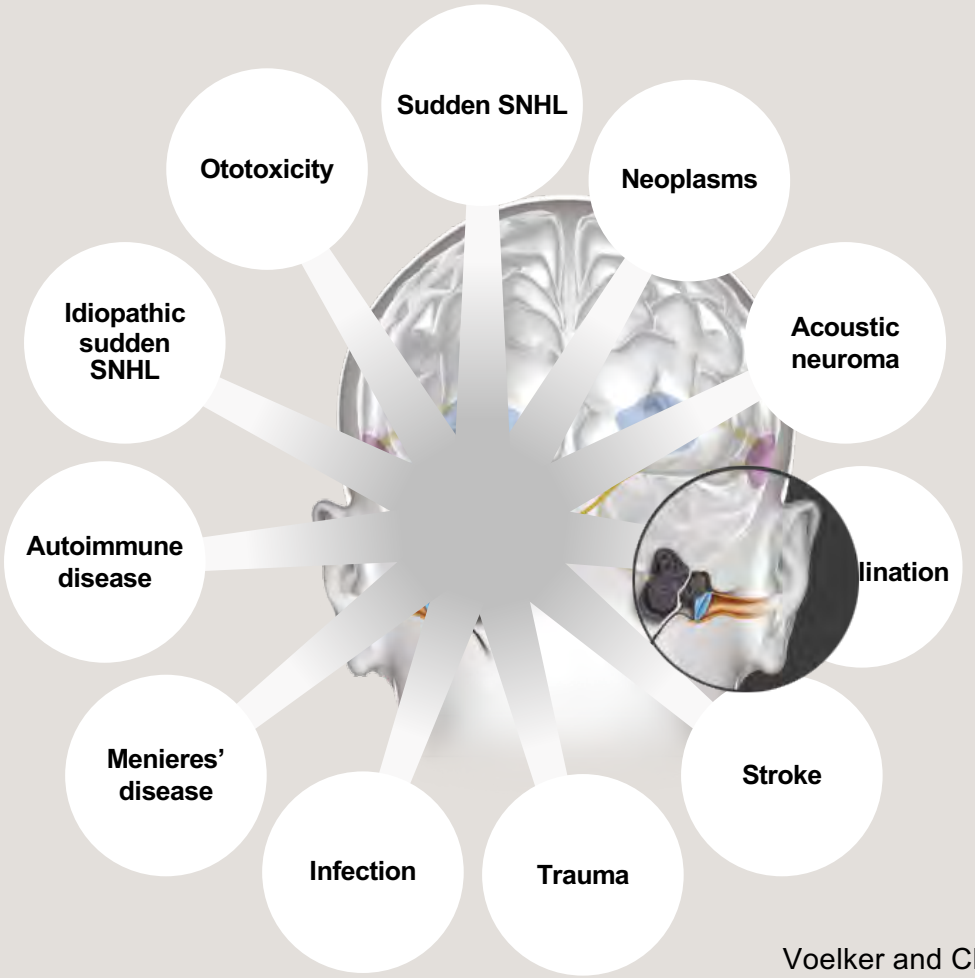
What has caused the SSD cases the you have seen?



Voelker and Chole 2010

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Who are the clients?

SSD can occur in all population groups

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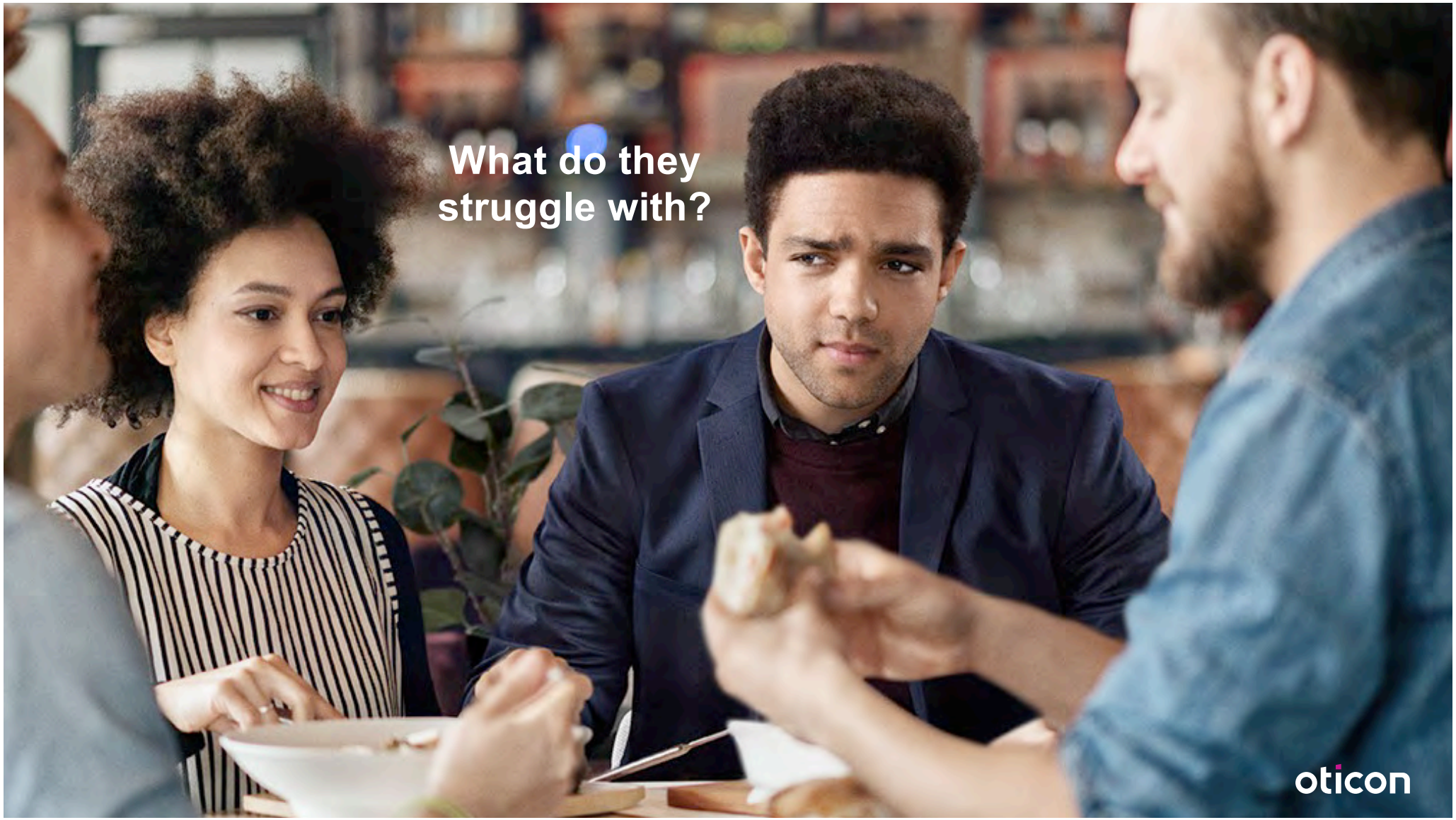

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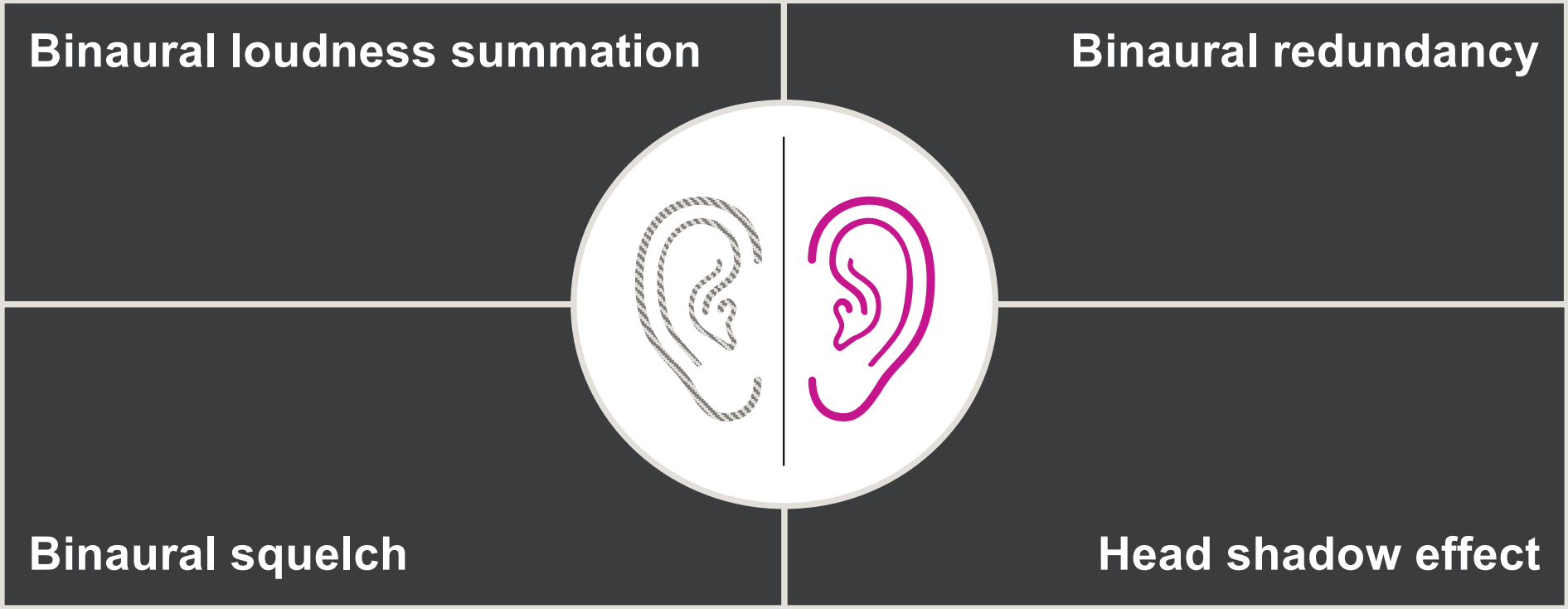
The importance of binaural hearing

2 ears are necessary in order to obtain the benefits of…



Dillon 2012

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Treatment options for SSD

Benefits and Considerations

	CROS 	BAHS 
Pros	• Non-surgical • Can accommodate for hearing loss on better ear	• Wears one device, nothing in better ear
Cons	• The better ear may be partially occluded • User must wear two devices • Does not restore binaural hearing	• Minimally invasive surgery • Does not restore binaural hearing

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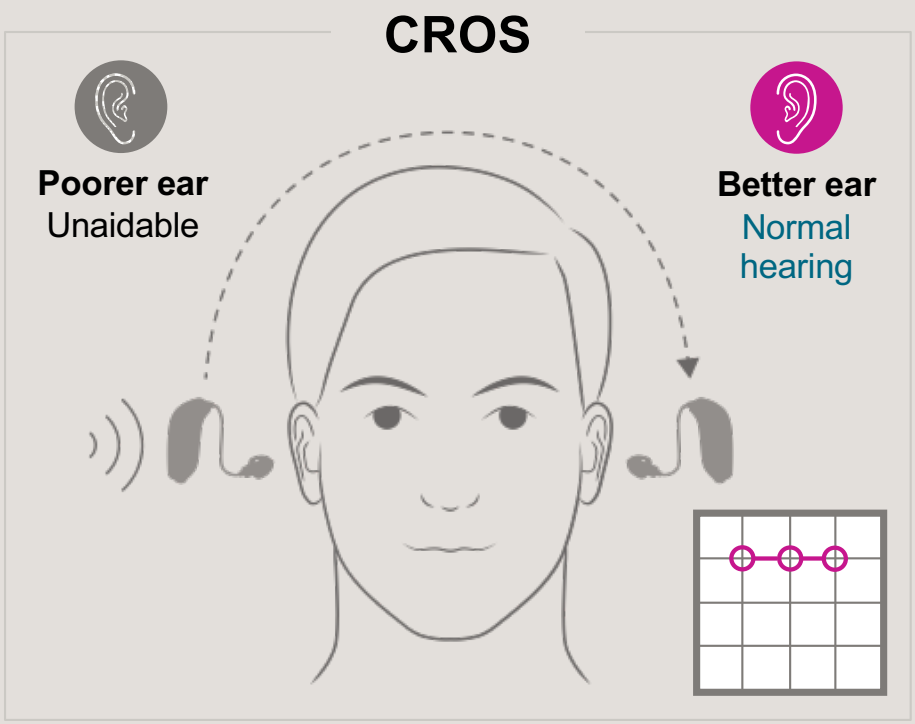
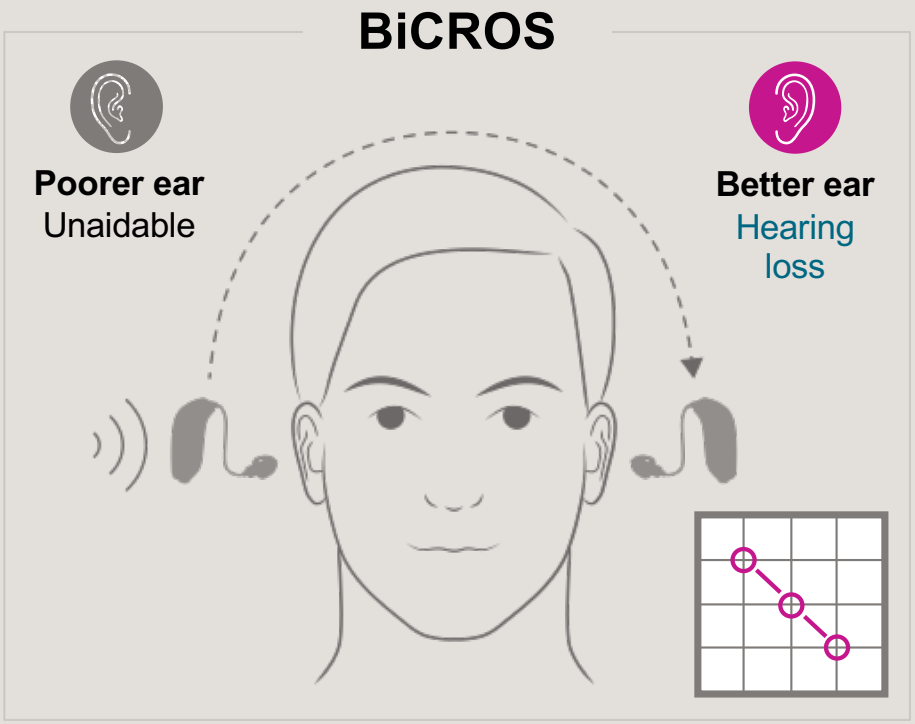
CROS/BiCROS – contralateral routing of signal

Two methods for wireless transmission from a poorer ear to a better ear





Taylor 2010

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Candidacy

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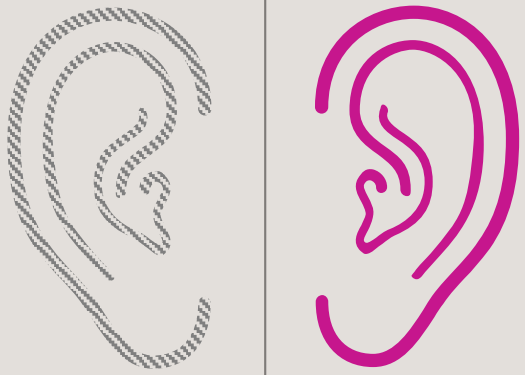
Candidacy

…can the user benefit from conventional amplification?



…is one ear normal or not?

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CROS for kids?

- CROS is intended for children over 36 months
- No tamper resistant solution available
- Available in 7 standard colors only

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Oticon CROS

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Velox S™ – power for BrainHearing™

The most advanced and powerful platform ever

- Increased processing power
- 56,000 measurements per second (30 times faster)

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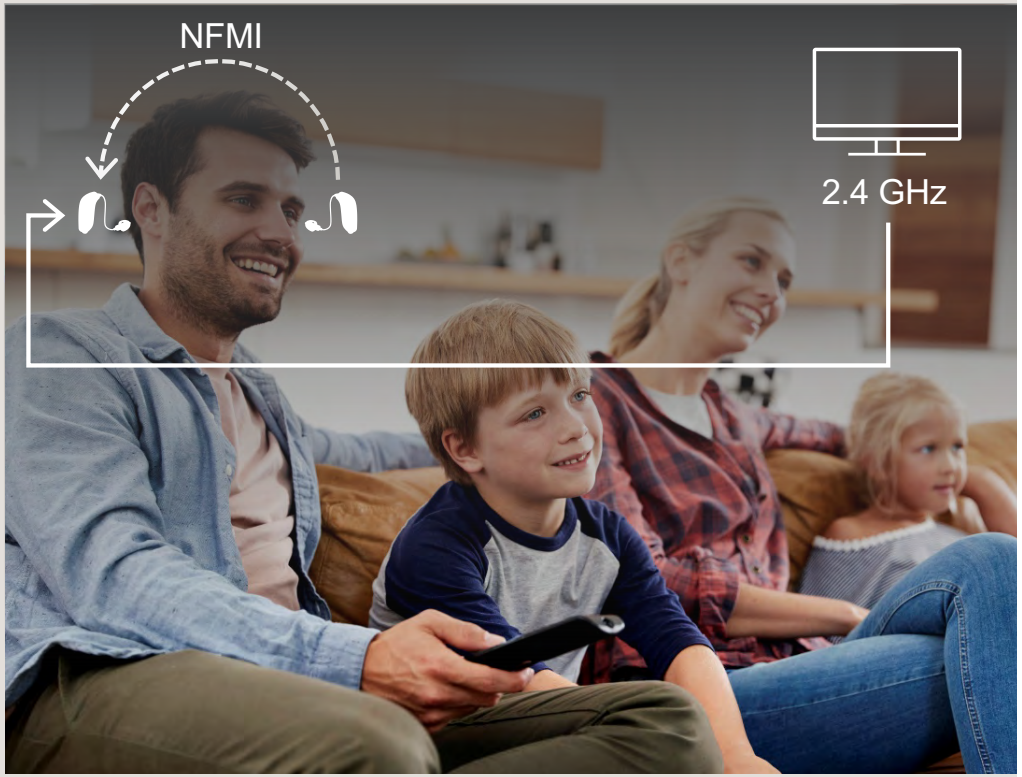
Industry first - TwinLink dual streaming

Receiver can simultaneously receive 2.4GHz and NFMI streamed signals



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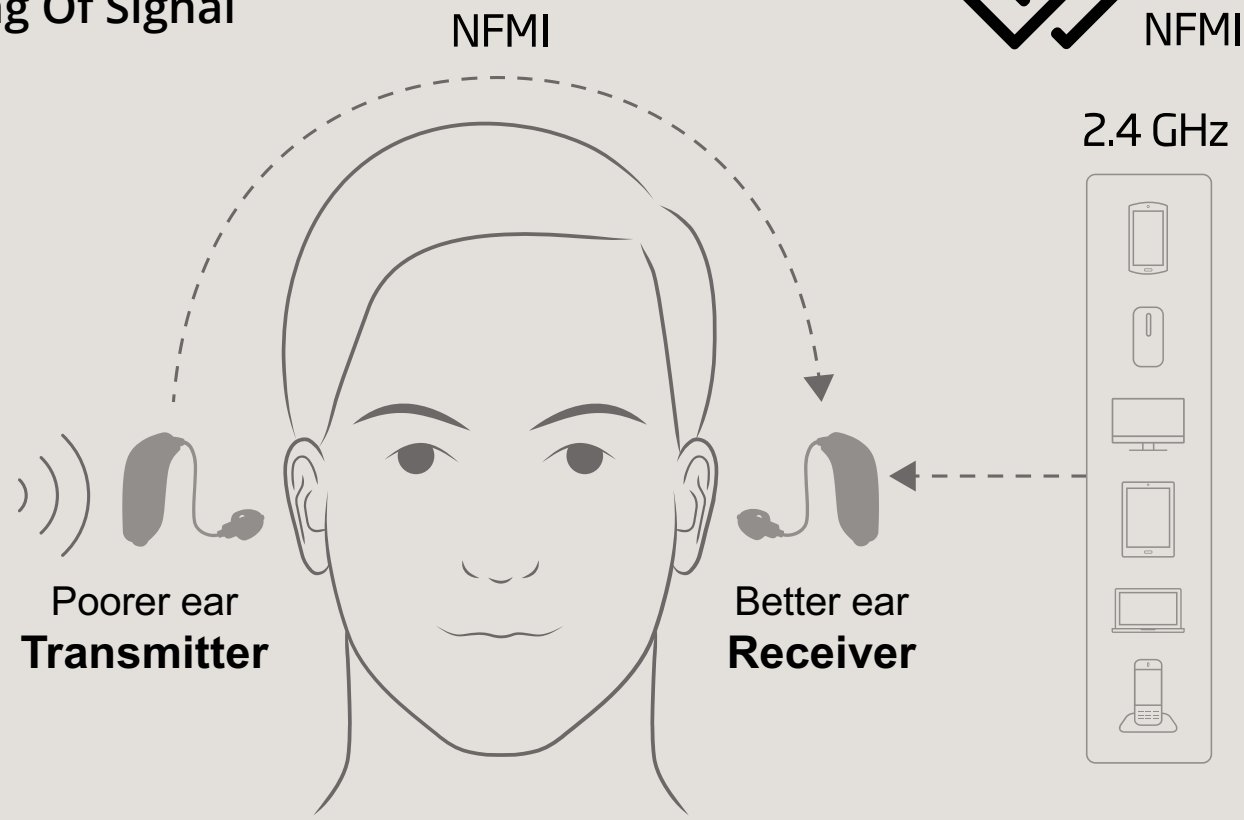
What is Oticon CROS?

Contralateral Routing Of Signal

TwinLink
NFMI + 2.4 GHz



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Evidence

WHITEPAPER
2019

Oticon CROS

SUMMARY

Oticon now introduces Oticon CROS, the first ever wireless CROS/BiCROS solution using an open sound paradigm and with dual-streaming capability using TwinLink™.

Oticon CROS is a unique solution for persons with single-sided deafness and it now makes the advanced signal processing of the OpenSound Navigator™ feature available to even more people with hearing loss.

A 2019 internal study shows the benefit of having dual-streaming capability within a CROS solution. While streaming sound using 2.4 GHz Bluetooth Low Energy technology, the CROS transmission was switched on and off in order to determine whether or not transmission of sound from the test subject's poorer ear side affected a person's awareness of speech in the environment. Results showed a 50% improvement in speech awareness from 33% to 49% awareness when transmission was active during streaming from an external source.

This tells us that CROS/BiCROS users can benefit greatly from having access to speech information in their environment, also when streaming.

Susanna Løve Callaway, Au.D.
Director of Clinical Audiology,
Oticon A/S, Denmark

Pernille Aaby Gade
Clinical Research
Audiology Assistant
Oticon A/S, Denmark

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PEOPLE FIRST

Study purpose

- Participants will perform better hearing speech from the poorer ear side when wearing transmitter vs not wearing transmitter.
- Simultaneous streaming using wireless blue-tooth low energy connection to the hearing aid is possible while CROS transmits signal from the impaired side to the hearing aid via NFMI.

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Study methodology

- Internal lab test
- Participants = 8
  - 4 CROS
  - 4 BiCROS
- Dual-task paradigm
  - Task related to 2.4 GHz streaming content
  - Task related to NFMI transmission content
- Outcome measure
  - Speech awareness: number of words heard with transmission ON vs. OFF

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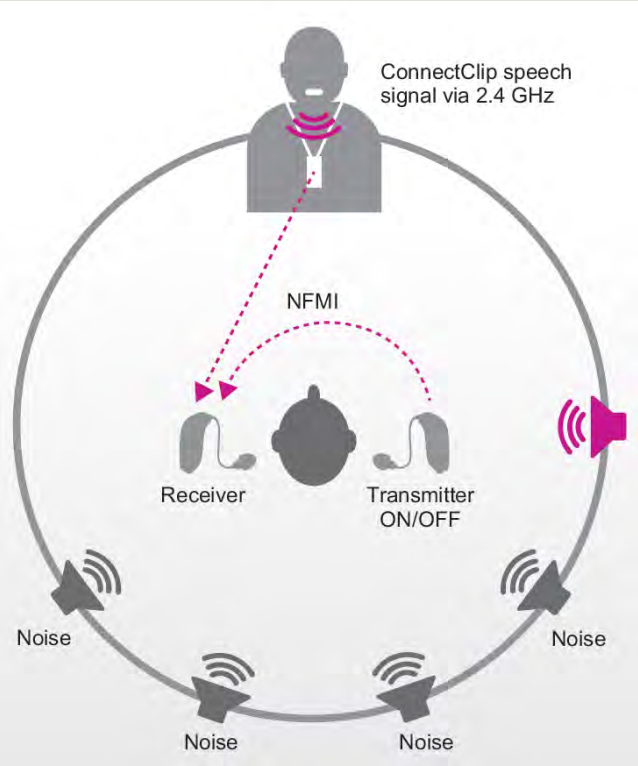
Study setup



- Target speech - side
  - 208 common two syllable words & phrases
  - Recorded in-house
- Target speech – front
  - Directly streamed into hearing aid
  - 1 minute news stories
- Noise source – behind
  - 4 speaker array
  - ICRA speech-shaped noise

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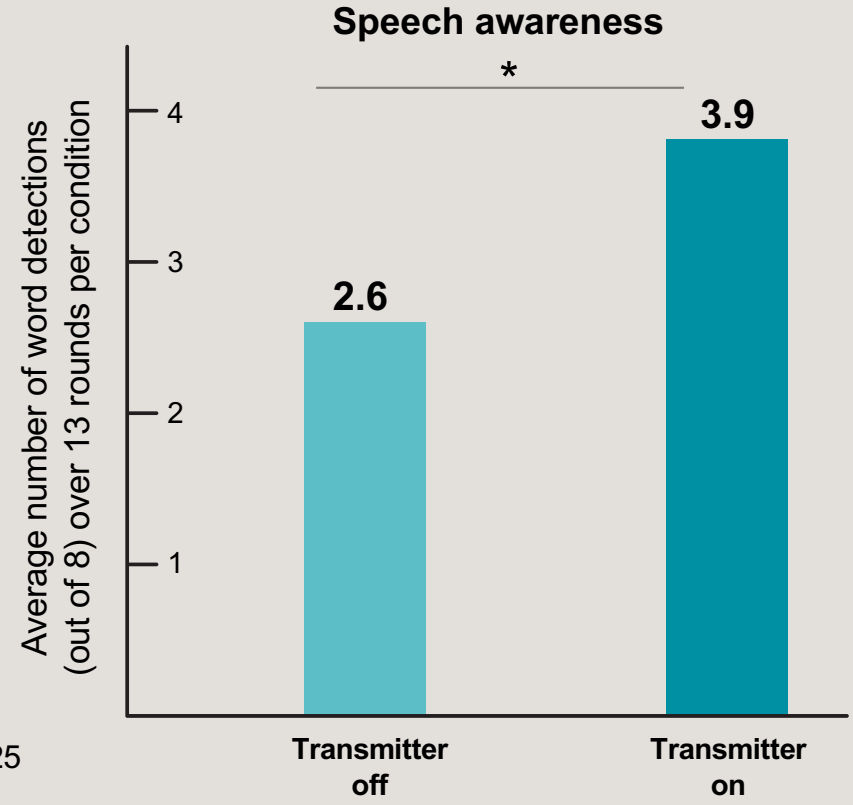
Study results

50% improvement in speech awareness while streaming



*P = 0,0025

(Callaway & Aaby Gade, 2019)

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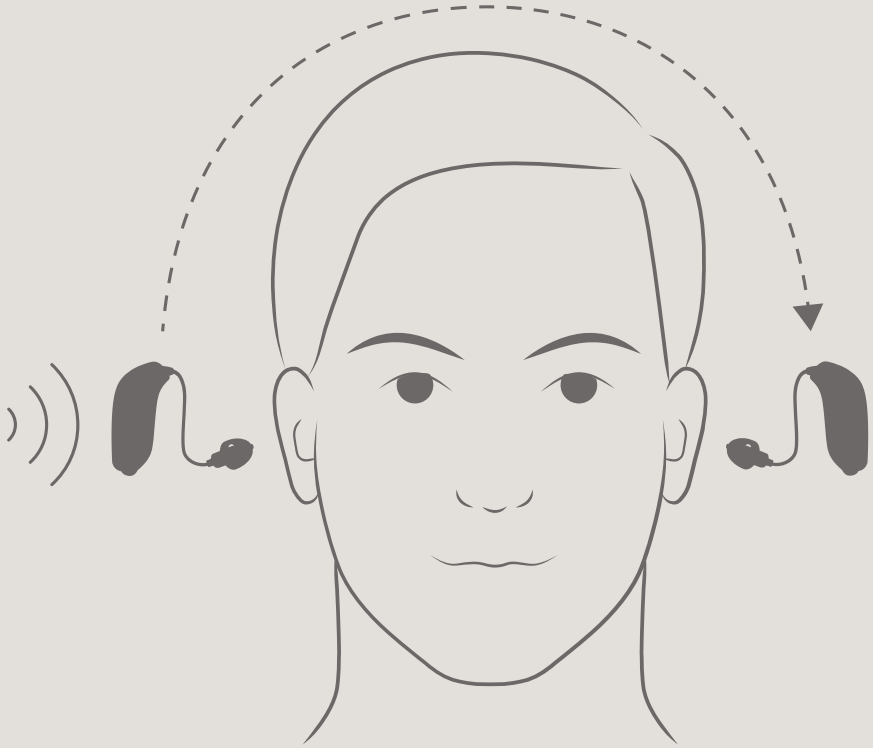
Practicalities



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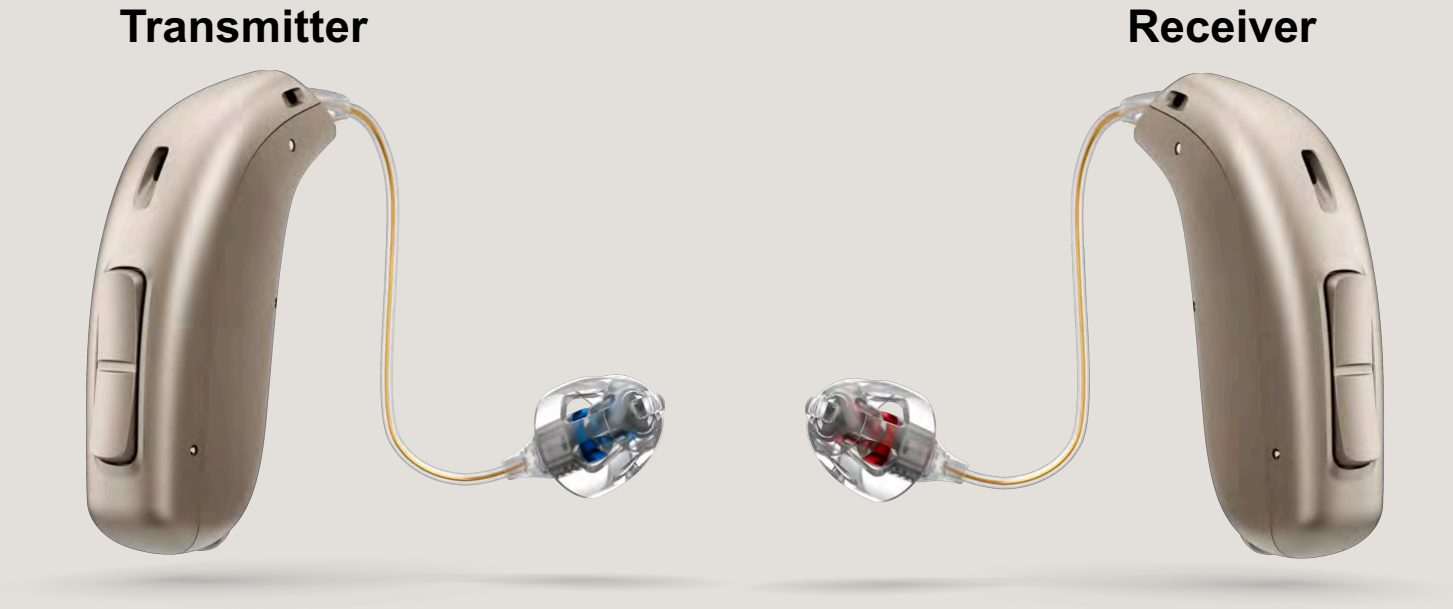
The Oticon CROS solution

An overview



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How to tell the difference

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The transmitter

Transmitter

- **Speaker is real but has no sound or acoustic purpose**
- **10 kHz broad bandwidth signal is transmitted**
- **Sound processing before sending to receiver**

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The transmitter

Transmitter

Volume control of transmitted sound

No Bluetooth® low energy technology

IP 68
dust & water resistant

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The transmitter

Sound processing

OpenSound Navigator settings:

- Simple environments: 0 dB NR
- Complex environments: -5 dB NR
- Transition: High

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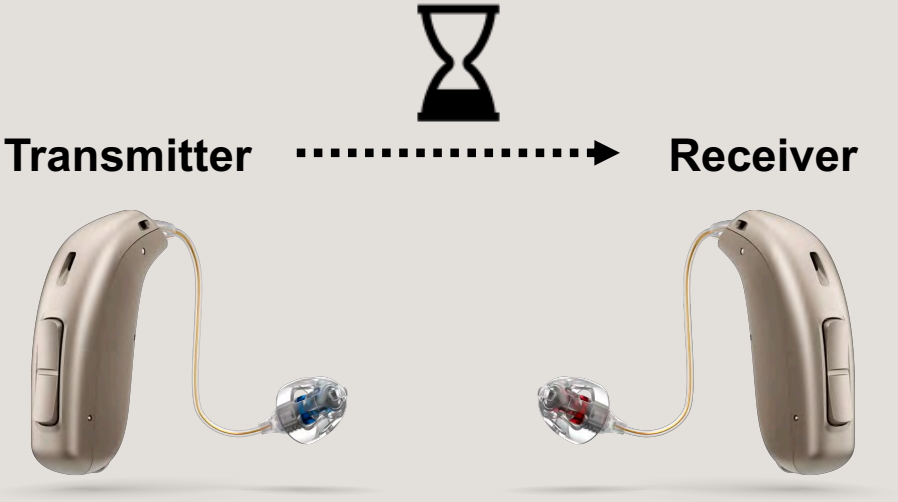
The transmitter

Sound processing



High pass filter with 1500 Hz cut-off:

- Sounds above 1500 Hz are transmitted via NFMI
- Sounds below 1500 Hz passes the head naturally

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Flexible controls

Transmitter

Volume control
Press at least 4 sec

Mute/unmute
Short press

(Short press to unmute)

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Transmitter

Receiver

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The receiver

Receive NFMI signal and mix with own mic signal

Monaural hearing aid
(normal hearing aid)

Receiver

Oticon ON App

Control of overall volume

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Oticon CROS

Compatibility

Oticon Xceed / Xceed Play

Oticon Opn S™/ Opn Play™/ Oticon Ruby

Please note: Oticon CROS is not compatible with Oticon Opn S 3 and Oticon Opn Play 2

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Oticon CROS

Compatibility

- For new CROS/BiCROS fitting: ideal to recommend miniRITE T for receiver to match transmitter style
- For existing wearer of other style: counsel on physical differences between devices
- Receiver must have Firmware 8.0

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What if the receiver is a different style?

MiniRITE
no volume control

ON oticon

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Oticon CROS

Find the client's favorite look

CO90
Chroma Beige

CO94
Terracotta

CO93
Chestnut Brown

CO63
Diamond Black

CO92
Steel Grey

CO91
Silver Grey

CO44
Silver

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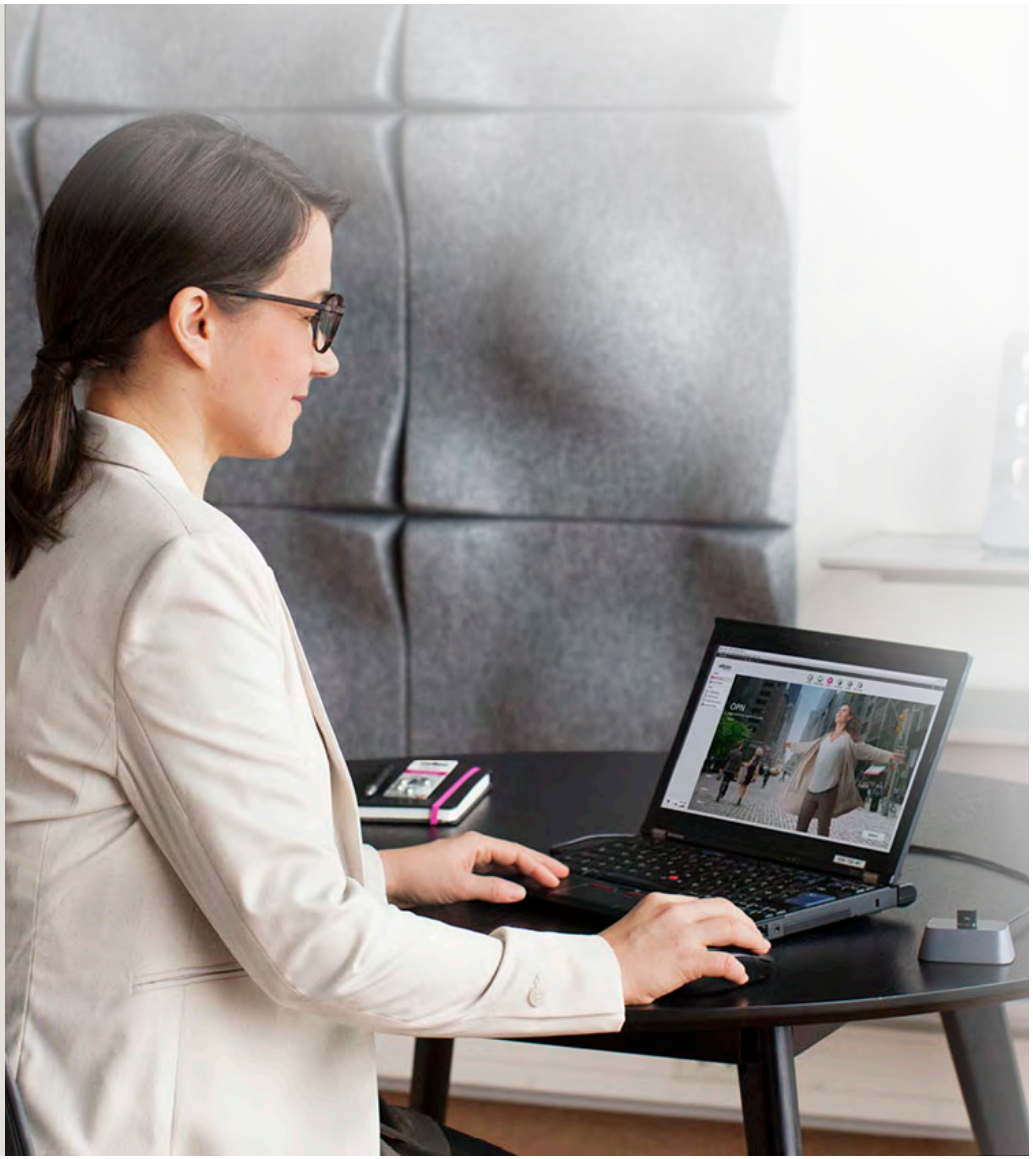
Programming



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Pairing transmitter and receiver for the first time

Close proximity pairing

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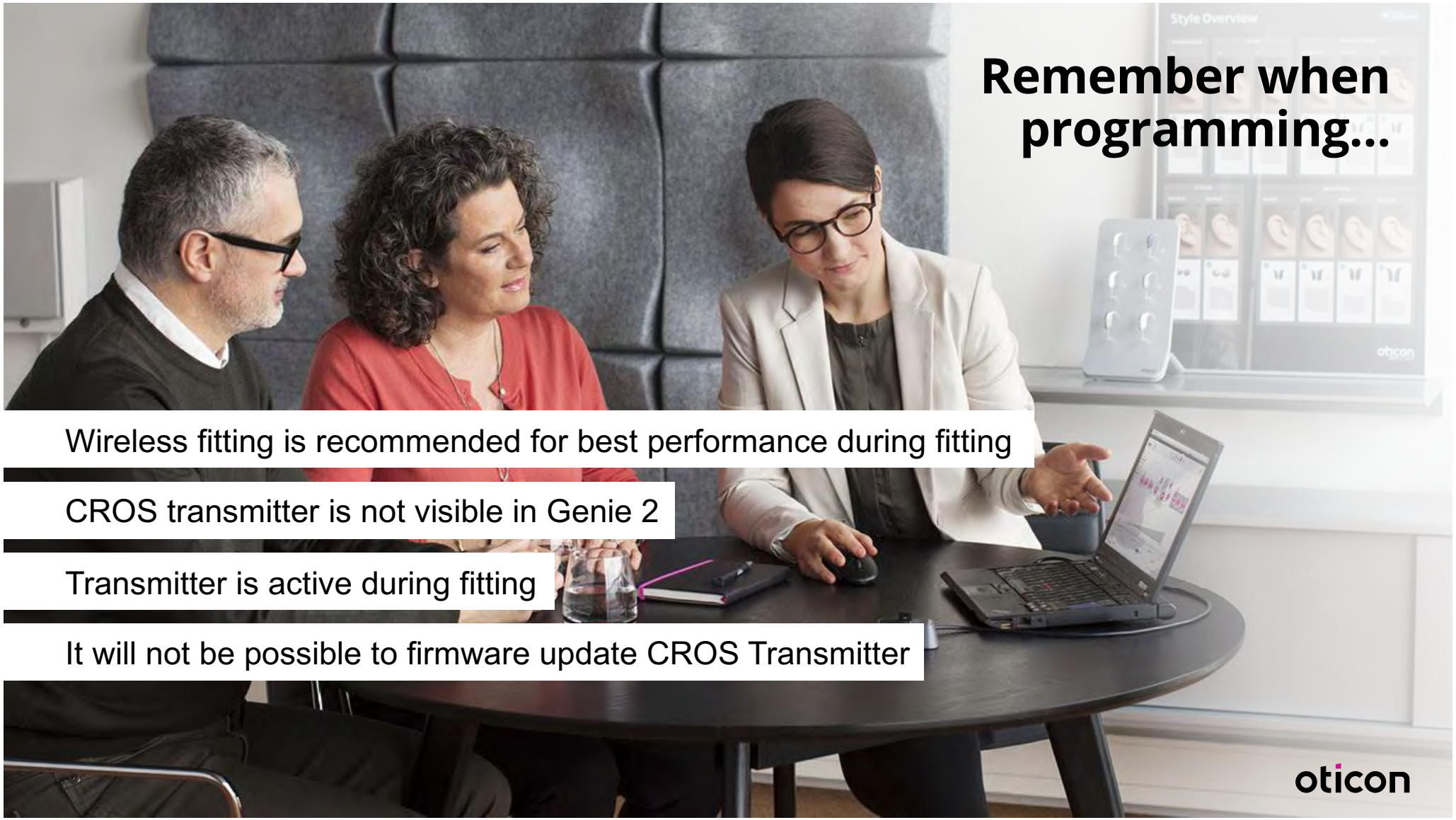

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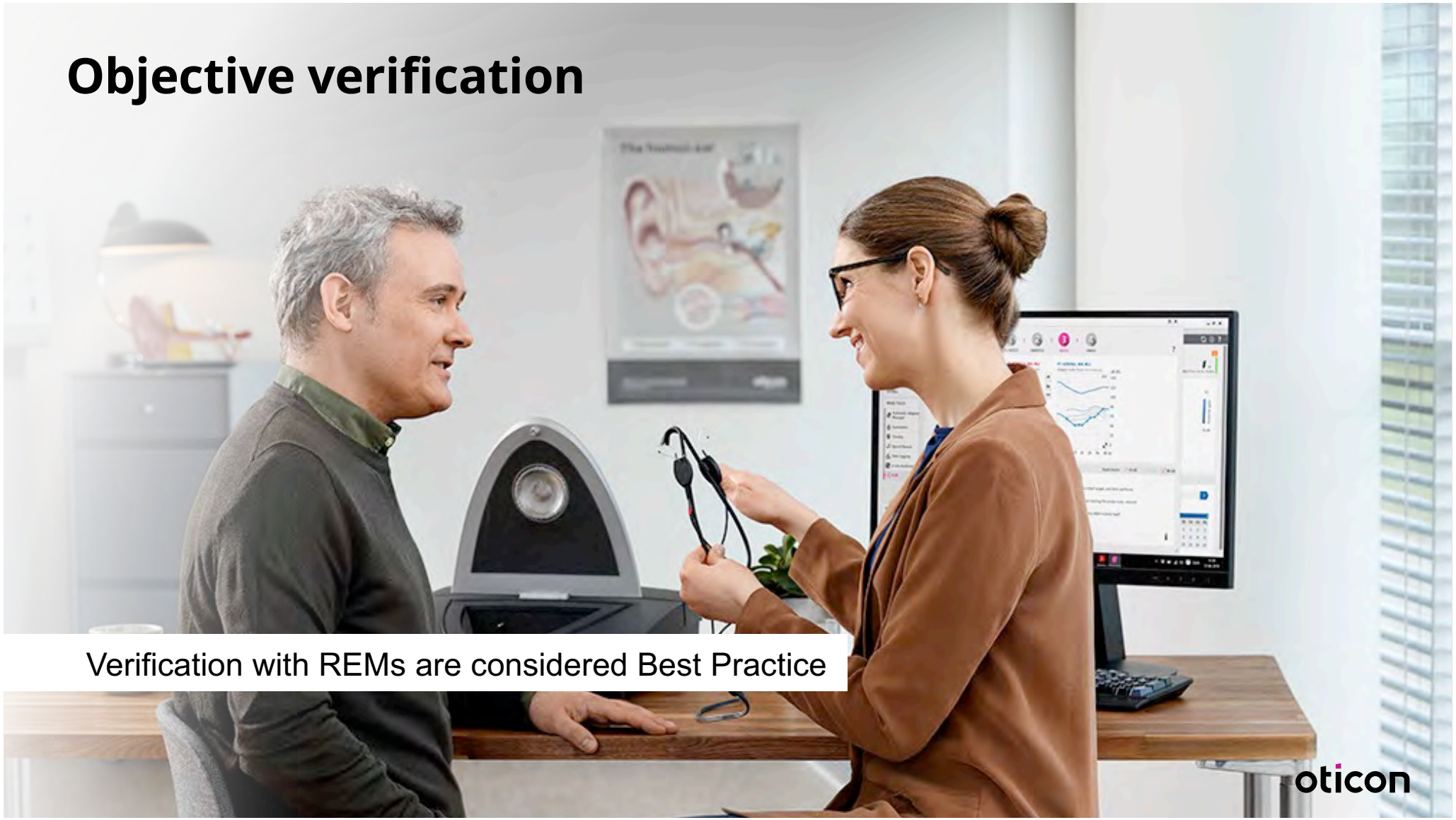
Objective verification



Verification with REMs are considered Best Practice

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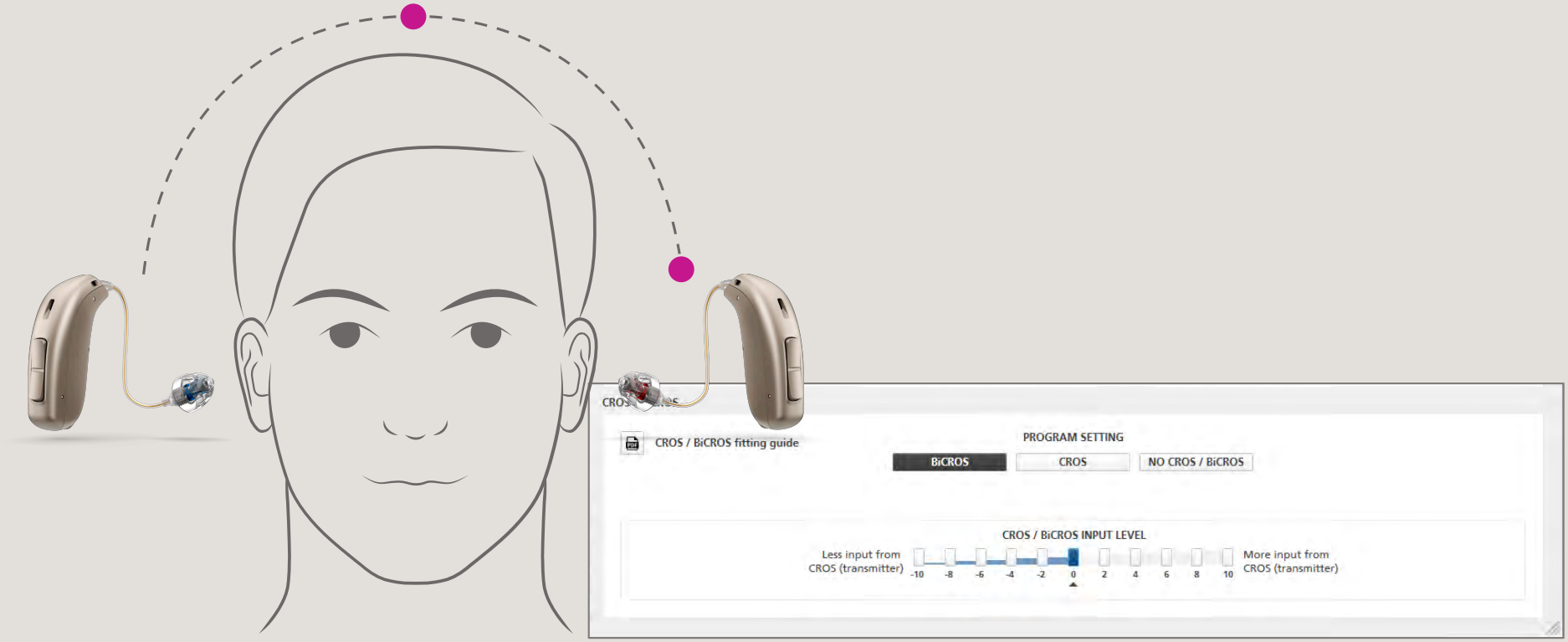
Balancing transmitter and receiver

The transferred sound should not be louder than other sound entering the better ear



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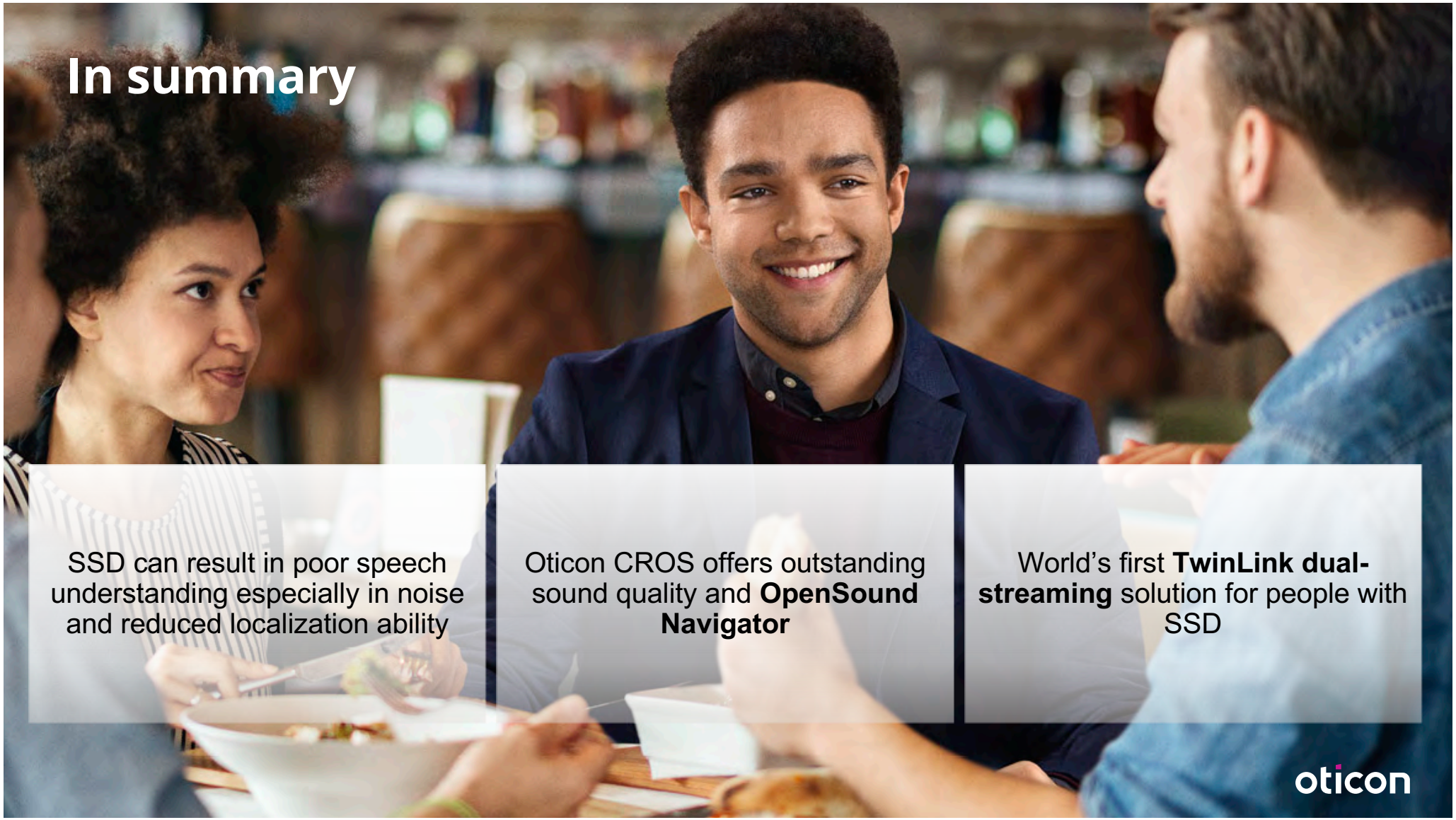
In summary



SSD can result in poor speech understanding especially in noise and reduced localization ability

Oticon CROS offers outstanding sound quality and **OpenSound Navigator**

World's first **TwinLink dual-streaming** solution for people with SSD

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Thank you!

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