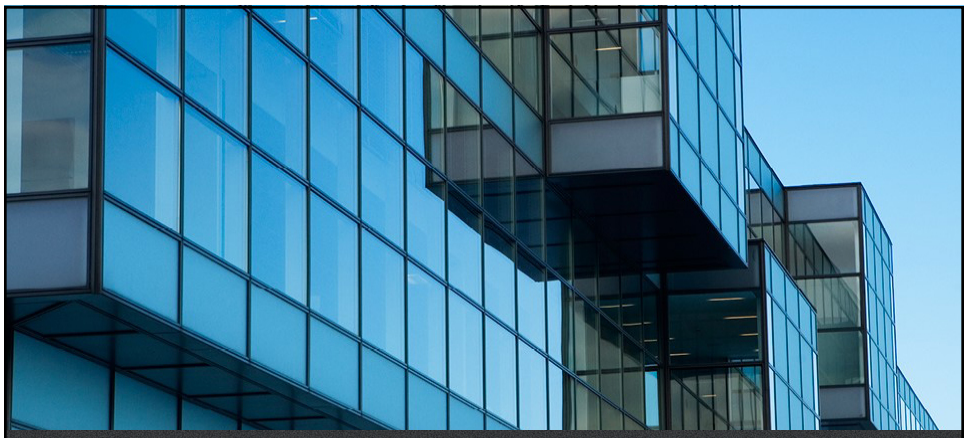

OTICON Audiology

Managing Severe Hearing Loss

Donald J Schum, PhD VP, Audiology

Learning Objectives

- … recognize the impact of severe hearing loss on the perception of speech through hearing aids
- ... identify the criteria that patients with severe hearing loss use when judging the impact of amplification
- … identify the most appropriate technology choice for each individual

Agenda

1. Why?
2. The Physiology of Severe Hearing Loss
3. Patient Performance
4. Success Criteria
5. Design of Power Products
6. Triaging Patient Needs
7. Asymmetrical Hearing Loss
8. Case Examples
9. Final Thoughts

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Why?

The new families

Oticon Xceed 1, 2, 3

Oticon Xceed Play 1, 2

Oticon CROS/BiCROS

Course presented in partnership with

CONTINUED

Agenda

1. Why?
2. **The Physiology of Severe Hearing Loss**
3. Patient Performance
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Observations about severe & profound loss:

- Variability is high
- Need a more adaptive fitting approach
- Residual Capabilities thinking

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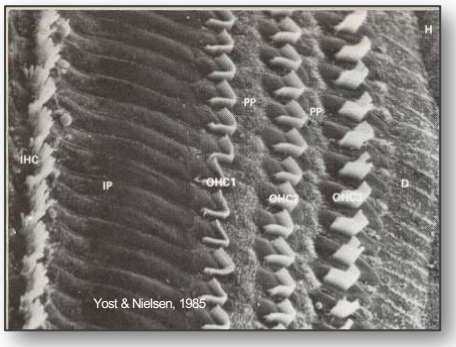
How do we describe a patient's auditory status?



- By the audiogram
- By the physiological condition of the ear

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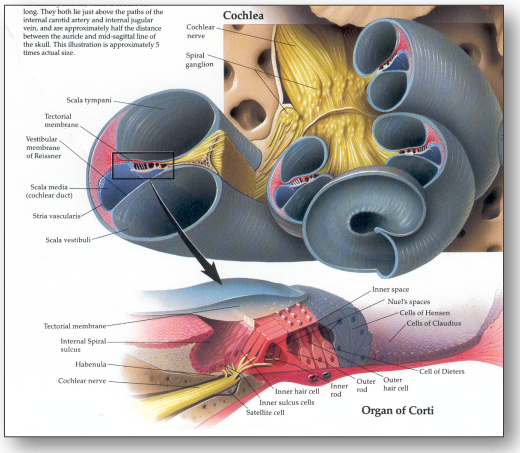

What else has to go right?

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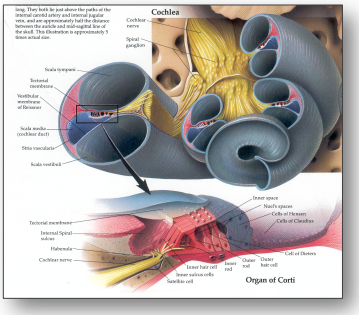
Observations about severe & profound loss:

- Multiple structures involved
- Longstanding vs. recent



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Maximum speech discrimination as a function of average hearing loss

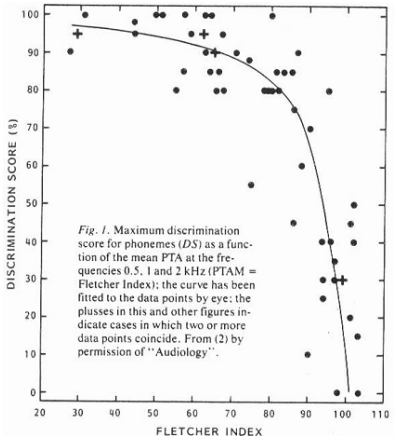

Fig. 1. Maximum discrimination score for phonemes (*DS*) as a function of the mean PTA at the frequencies 0.5, 1 and 2 kHz (PTAM = Fletcher Index); the curve has been fitted to the data points by eye; the plusses in this and other figures indicate cases in which two or more data points coincide. From (2) by permission of "Audiology".

Lamore, Verweij & Brocaar, 1990

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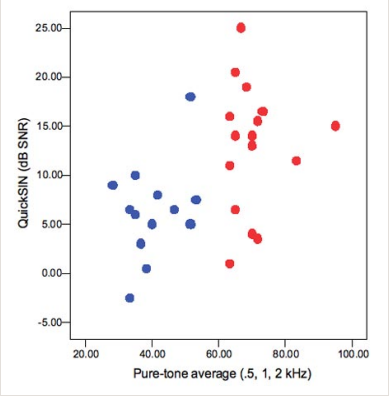
Reduced speech recognition

Speech understanding in noise…

Quick SIN (Speech in Noise)



Souza, P. 2009

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Temporal cues

What are they? Why are they important?

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aaarrrrr!

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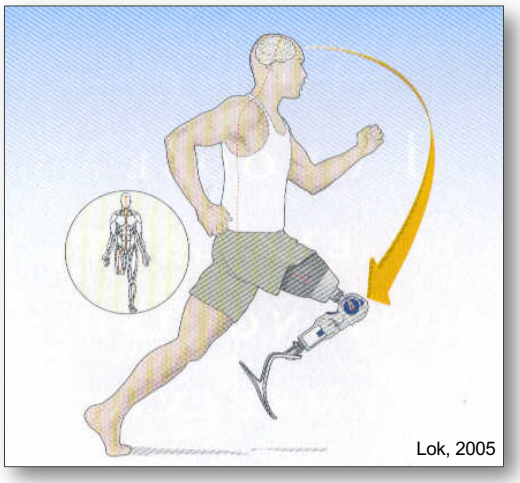

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Improvement …

On a dimension that is meaningful to the patient

What matters to the patient?

- Improved performance in challenging environments
- Improved access to speech in quiet
- Improved awareness
- Speechreading support
- Connectivity
- Better confidence
- Etc.

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Why is it important to have a dedicated super power rationale?

Adequate loudness perception

Need for audibility takes priority

The importance of temporal cues

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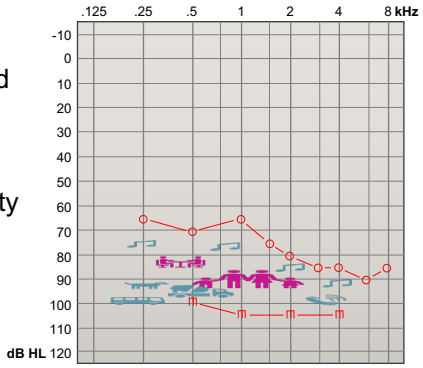
Fitting sound into the dynamic range

Severe and profound losses

- Over-compressed speech
- Distortion
- Poor sound quality
- …



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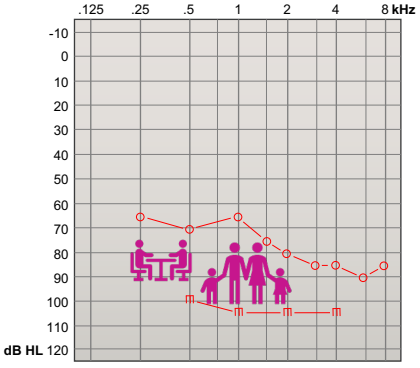
The DSE strategy

DSE and Speech Guard LX



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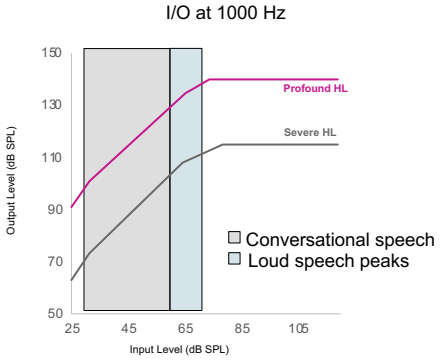
Dynamic Speech Enhancement (DSE)

- Linear through the range of Moderate Speech
- Primary knee point above that range
- Peaks of Loud Speech pushed up to MPO



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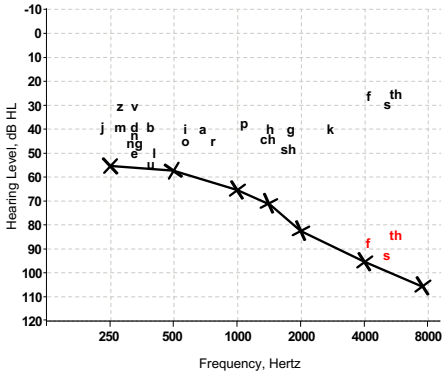
Frequency lowering



J. Alexander

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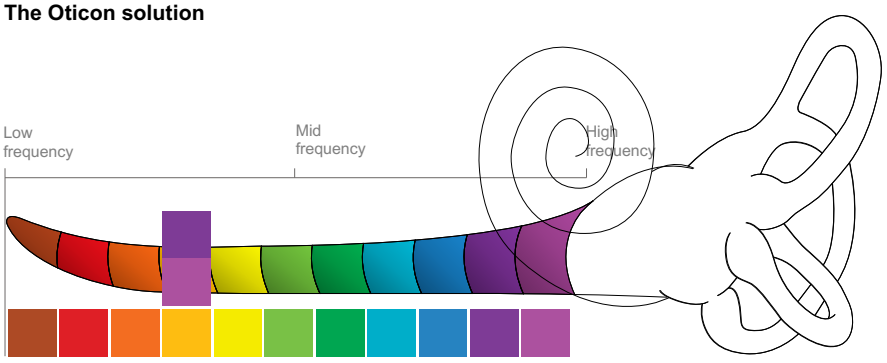
Speech Rescue LX

The Oticon solution



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Factors to consider (partial list):

- Thresholds
- Speech understanding ability
- Asymmetries
- Perceived communication needs
- History with amplification
- Etiology
- Duration of loss
- Willingness to accept invasive devices

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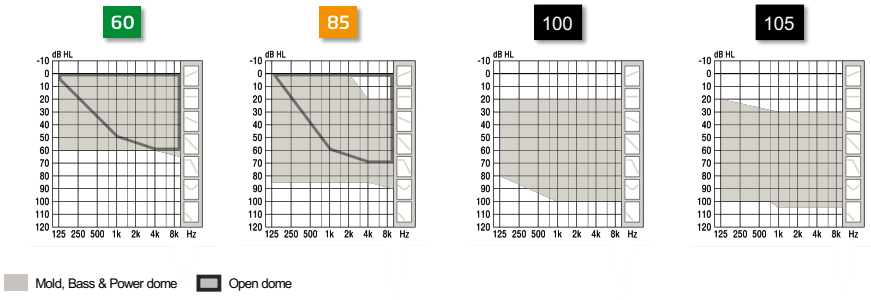
miniRITE, miniRITE T, and miniRITE R fitting range

Now also for severe-to-profound losses with miniFit receivers



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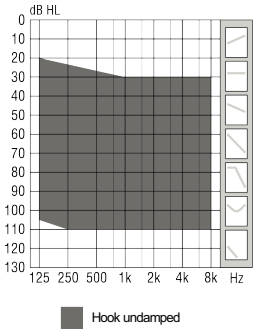
BTE SP and BTE UP fitting ranges

For severe and profound losses

110



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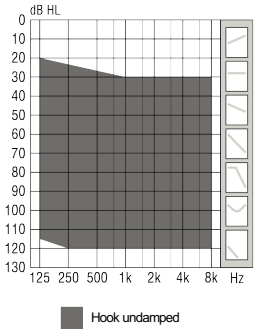

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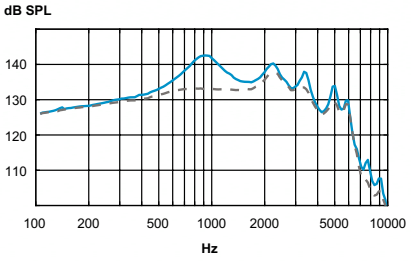
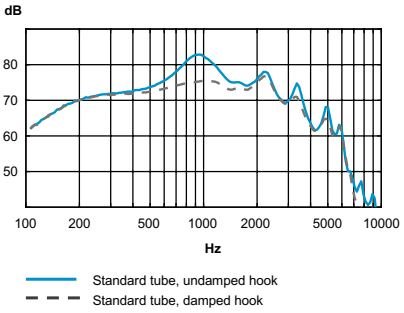
OSPL90



Full-on Gain



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BTE SP and BTE UP fitting ranges

For severe and profound losses

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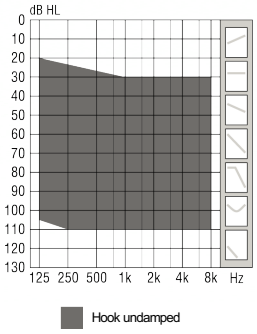

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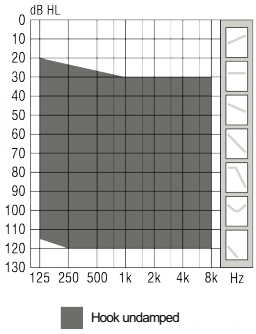

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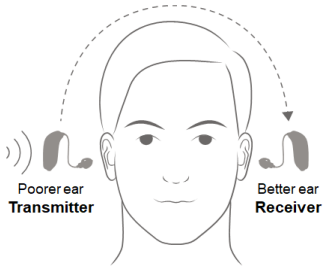
Observations about CROS & BiCROS:

- Basic definition …
- HCP may have a strong opinion
- BiCROS likely more popular than CROS
- CROS acceptance comes down to perceived need on the part of the patient



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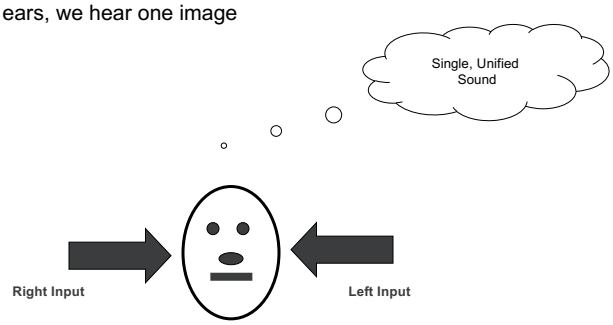
Basics of Hearing

- Despite two ears, we hear one image



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Types of Asymmetries

- Both ears reasonably aidable, one better
- One dead, one aidable
- One normal, one aidable

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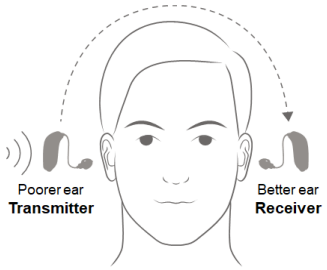
Observations about CROS & BiCROS:

- Is the poorer ear truly unusable?



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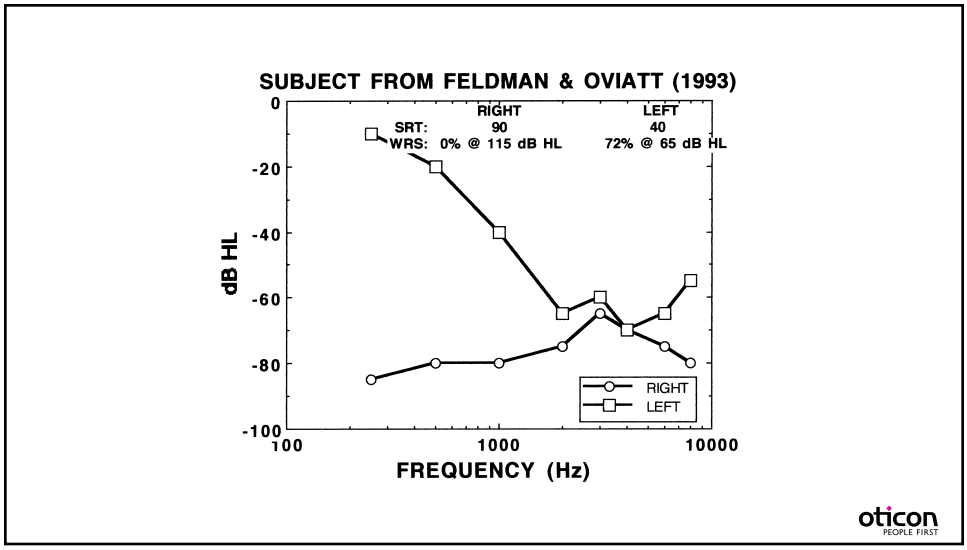
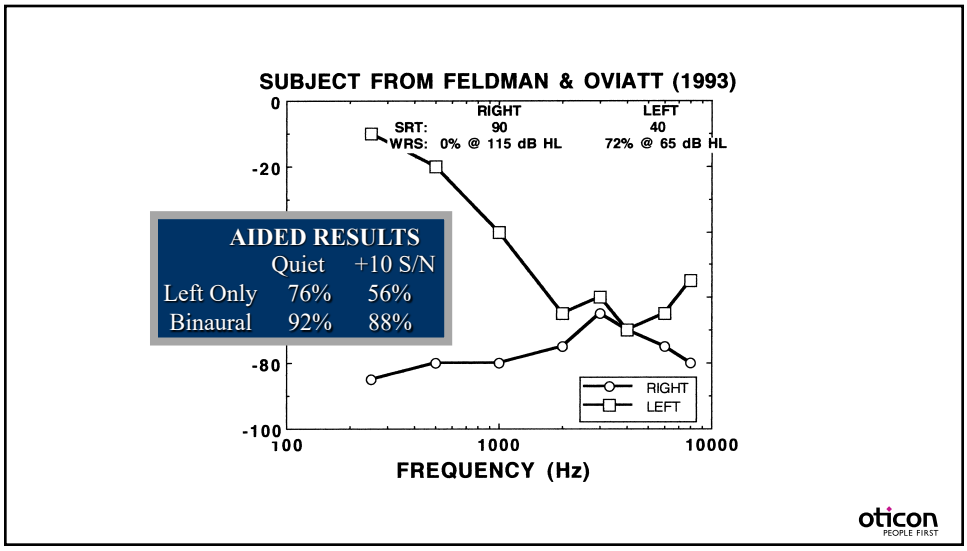

SUBJECT FROM FELDMAN & OVIATT (1993)
RIGHT
LEFT
SRT:
90
40
WRS:
0% @ 115 dB HL
72% @ 65 dB HL
dB HL
0
-20
-40
-60
-80
-100
100
1000
10000
FREQUENCY (Hz)
RIGHT
LEFT
oticon
PEOPLE FIRST


SUBJECT FROM FELDMAN & OVIATT (1993)
RIGHT
LEFT
SRT:
90
40
WRS:
0% @ 115 dB HL
72% @ 65 dB HL
AIDED RESULTS
Quiet
+10 S/N
Left Only
76%
56%
Binaural
92%
88%
0
-20
-80
-100
100
1000
10000
FREQUENCY (Hz)
RIGHT
LEFT
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Yes, two hearing aids …

But when?

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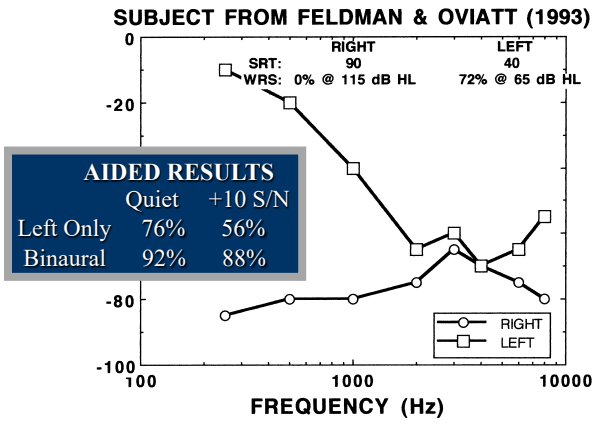

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Factors to consider (partial list):

- Thresholds
- Speech understanding ability
- Asymmetries
- Perceived communication needs
- History with amplification
- Etiology
- Duration of loss
- Willingness to accept invasive devices

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Outside-in perspective:

What is the nature of the hearing loss? What are the needs?

- Clear candidates for SP & UP
- Clear candidates for CROS
- Clear candidates for BiCROS
- Grey areas

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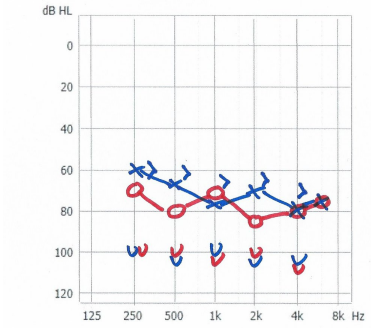
Case 3: 24 yr old female; has had hearing loss "all her life"; has worn HAs, but last pair 10 yrs old; things tend to be "loud and rackety"



	SRT	WRS	(Level)	S/N
Right:	70	54%	90	+12.5
Left:	65	58%	85	+10.0
SF:				

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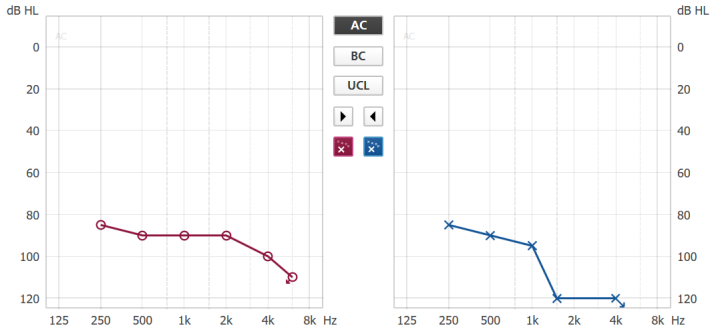
Super Power or Ultra Power?



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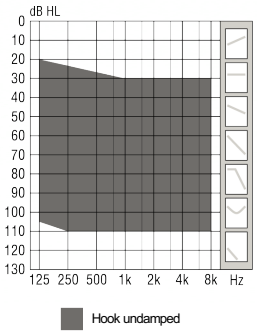
BTE SP and BTE UP fitting ranges

For severe and profound losses

110



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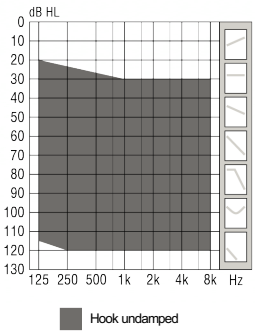

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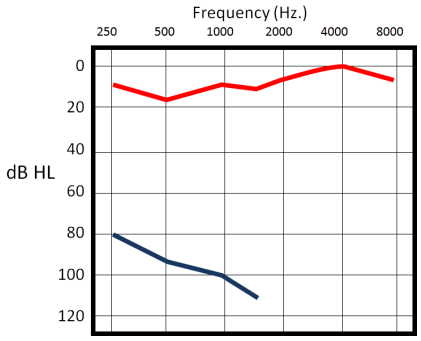
Patient: JF Hx: Sudden SNHL



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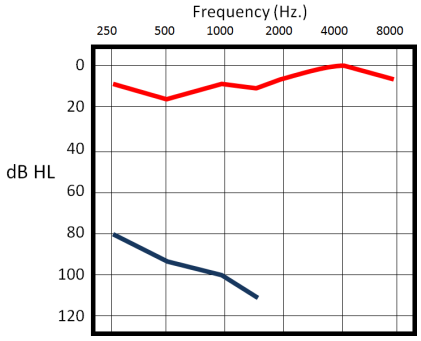
Patient: JF Hx: Sudden SNHL



"Mild" BiCROS?

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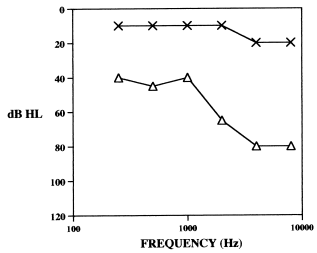
PATIENT: AM
64 YR OLD FEMALE



	SRT	WRS	HL
RIGHT	40 dBHL	8%	80 dBHL
LEFT	10 dBHL	100%	10 dBHL

ETIOLOGY: MENIERE'S

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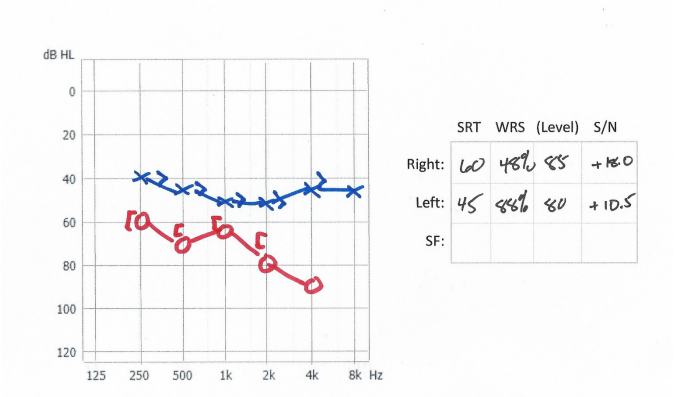
Case 4a: 72 yr old female; hearing has been getting worse last several years, but has not tried HAs yet; etiology unknown



	SRT	WRS	(Level)	S/N
Right:	60	48%	85	+18.0
Left:	45	88%	80	+10.5
SF:				

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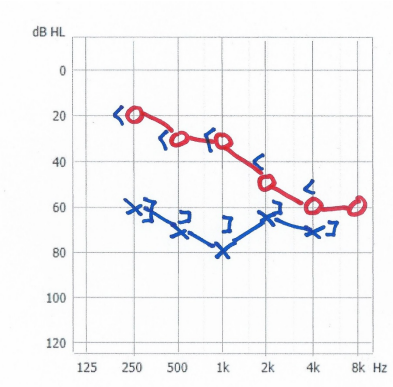
Case 4b: 42 yr old female; bilateral Meniere's; vestibular symptoms and thresholds stable so ready for devices



	SRT	WRS	(Level)	S/N
Right:	40	20%	70	+25.0
Left:	70	8%	85	CNT
SF:				

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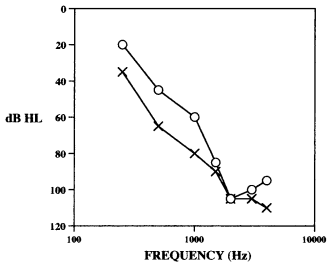
PATIENT: PH
52 YR OLD FEMALE



	SRT	WRS	HL
RIGHT	50 dBHL	16%	90 dBHL
LEFT	70 dBHL	20%	95 dBHL

ETIOLOGY: UNKNOWN, PROGRESSIVE

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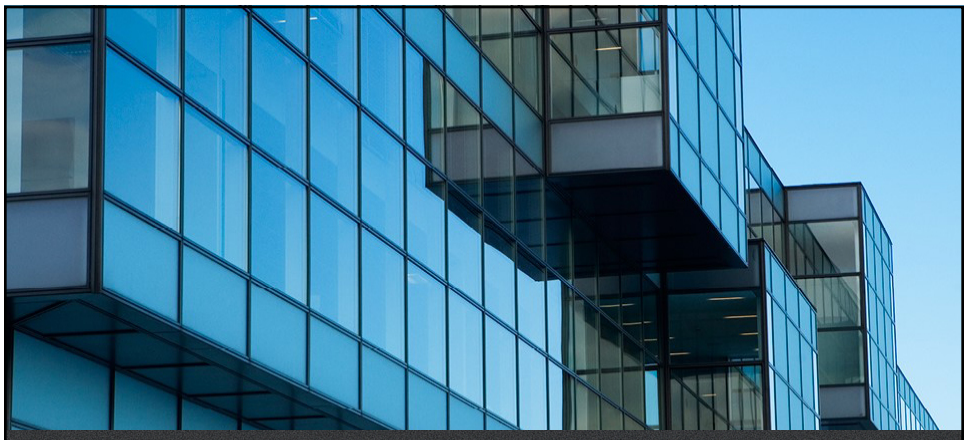

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Managing Severe Hearing Loss

Donald J Schum, PhD D.Schum@Oticon.com