



ORDINE  
MEDICI CHIRURGHI  
E ODONTOIATRI  
DELLA PROVINCIA  
DI BRESCIA

COMMISSIONE CULTURA

*Coordinatore: Dott. Germano Bettoncelli*

## *Convegno*

# COLLABORAZIONE TRA SPECIALISTA, MEDICO DI MEDICINA GENERALE E PEDIATRA DI LIBERA SCELTA NEL TRATTAMENTO DELL'IPOACUSIA

*Sala Conferenze Ordine Medici ed Odontoiatri - Via Lamarmora n. 167 (Palazzo il Diamante) - Brescia*

**15 ottobre 2016 - ore 8.00**



**ASST degli Spedali Civili di Brescia**  
**Università degli Studi di Brescia**

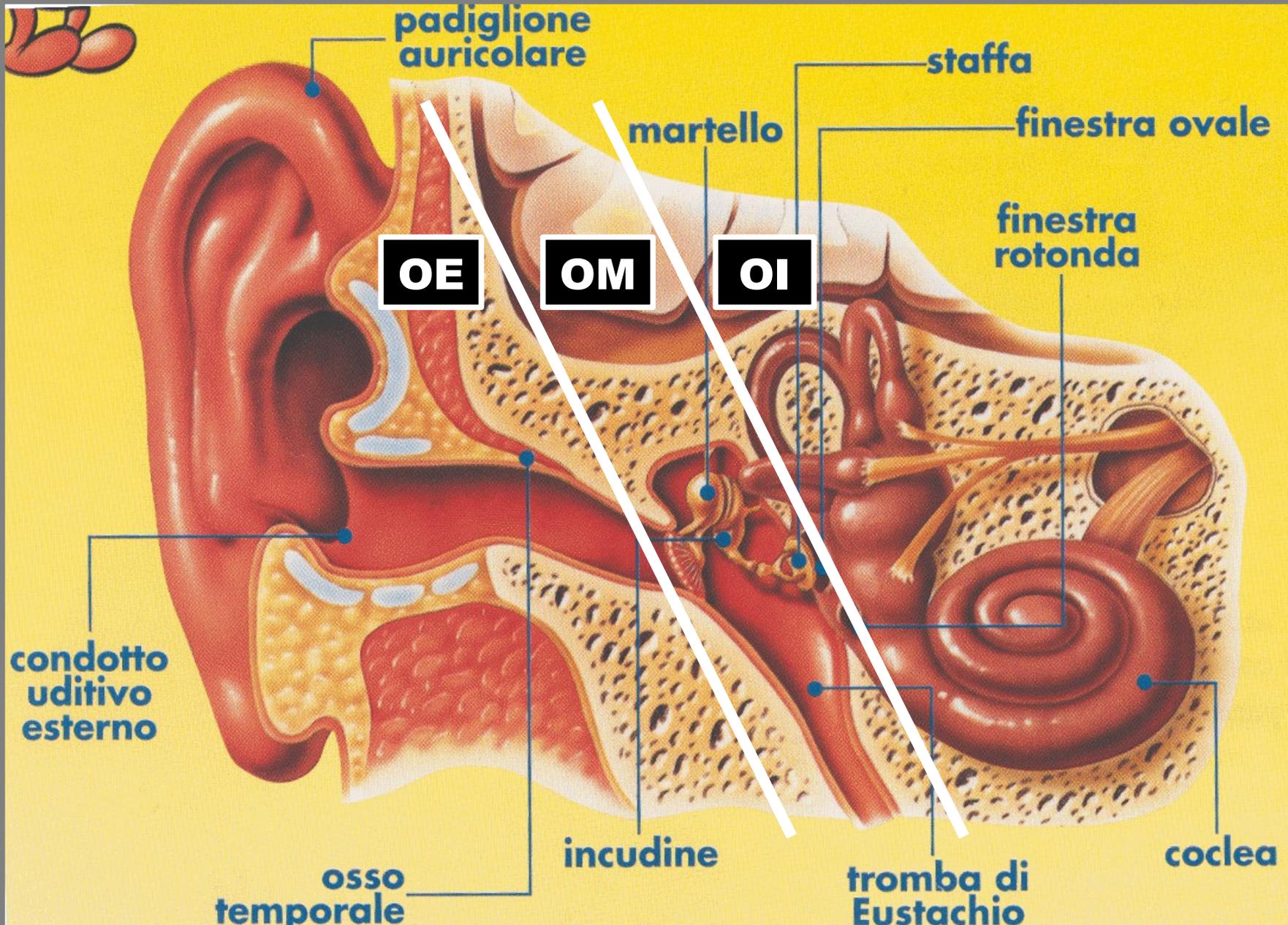


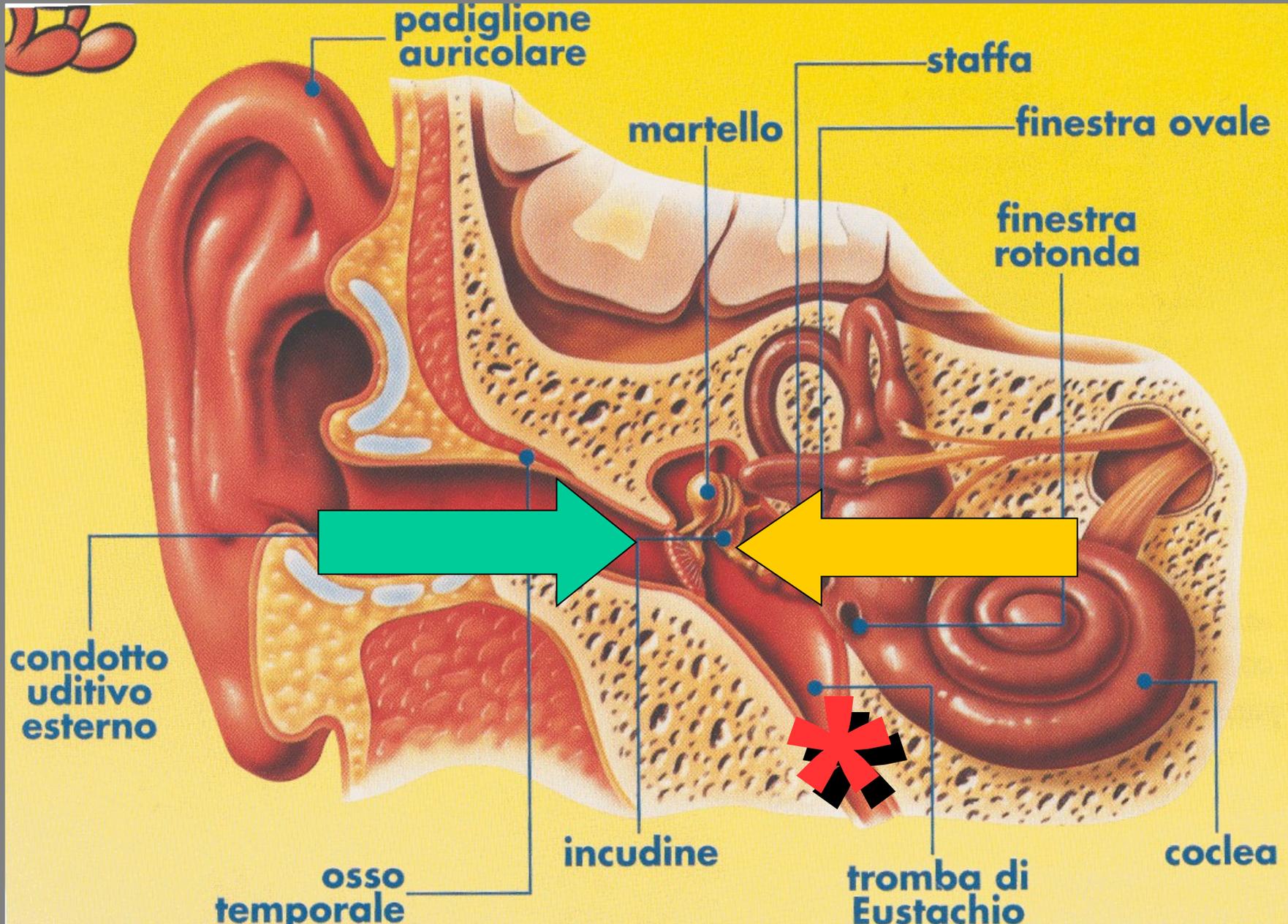
# **INQUADRAMENTO DIAGNOSTICO DELLE IPOACUSIE NELL'ADULTO**

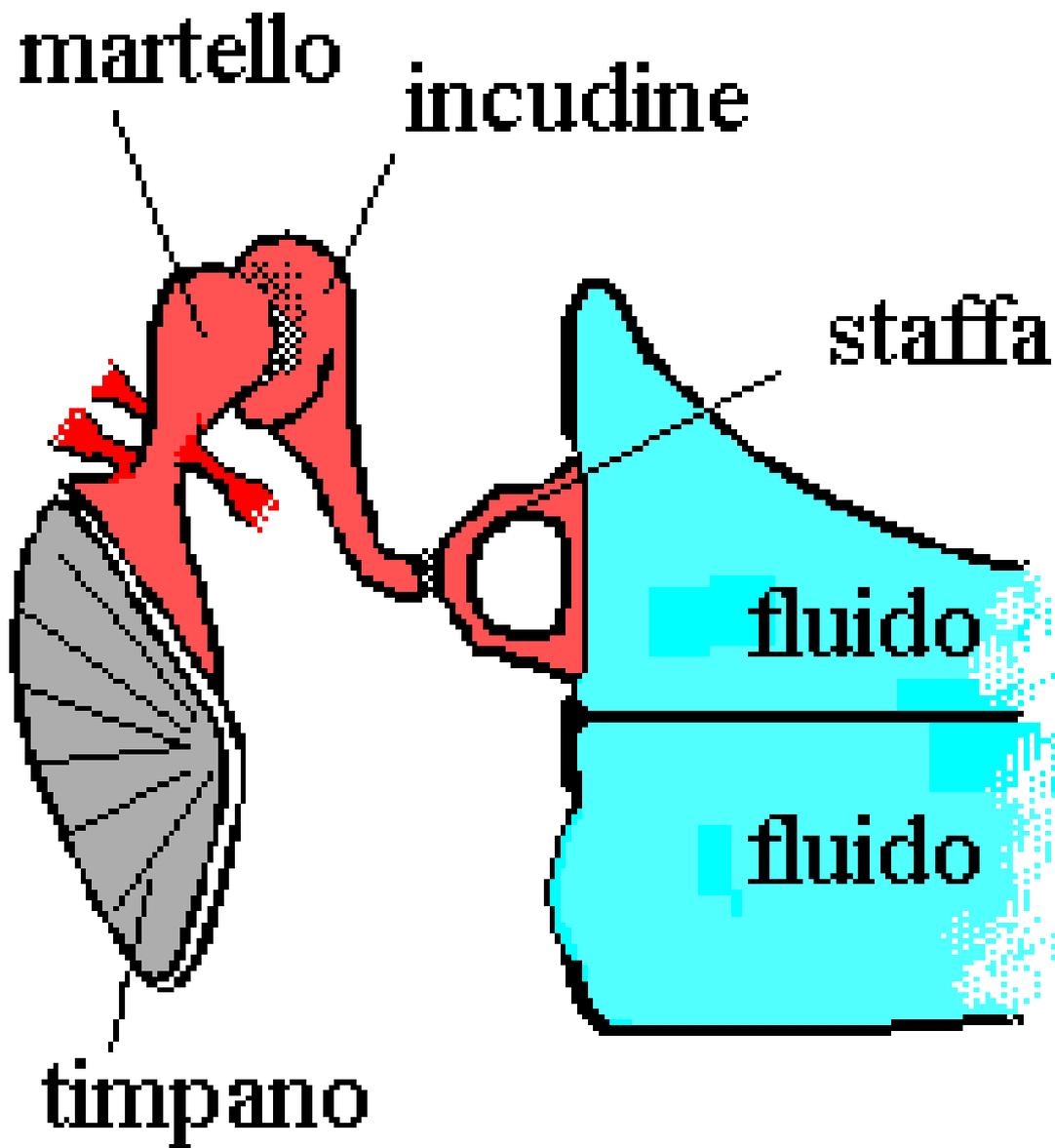
**Dott. C. Balzanelli**

*Servizio di Audio-Vestibologia UO ORL - ASST Spedali Civili di BS*

Direttore: Prof. P Nicolai



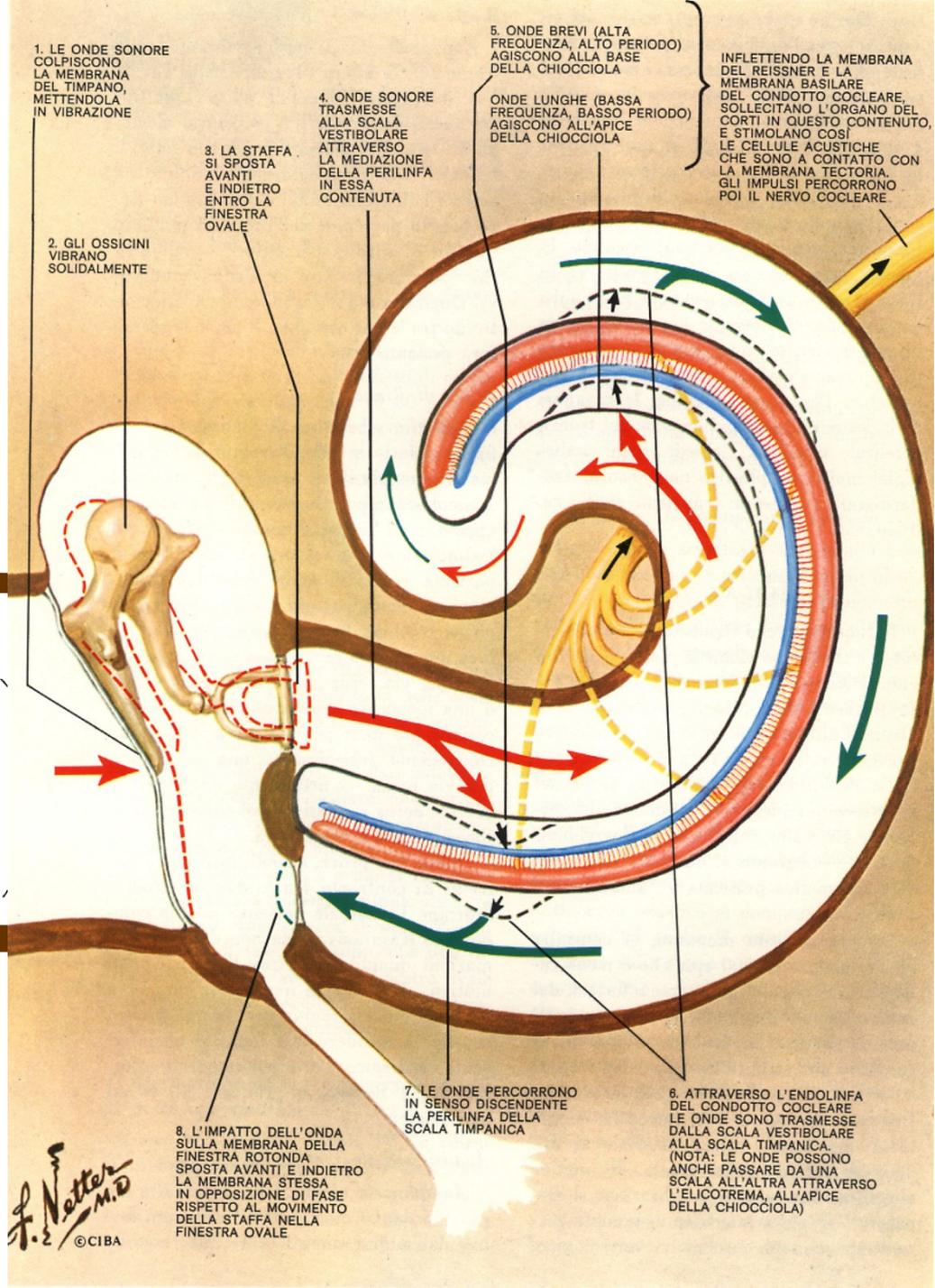
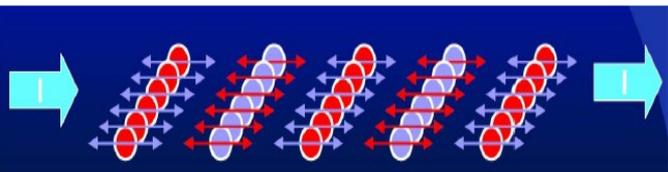


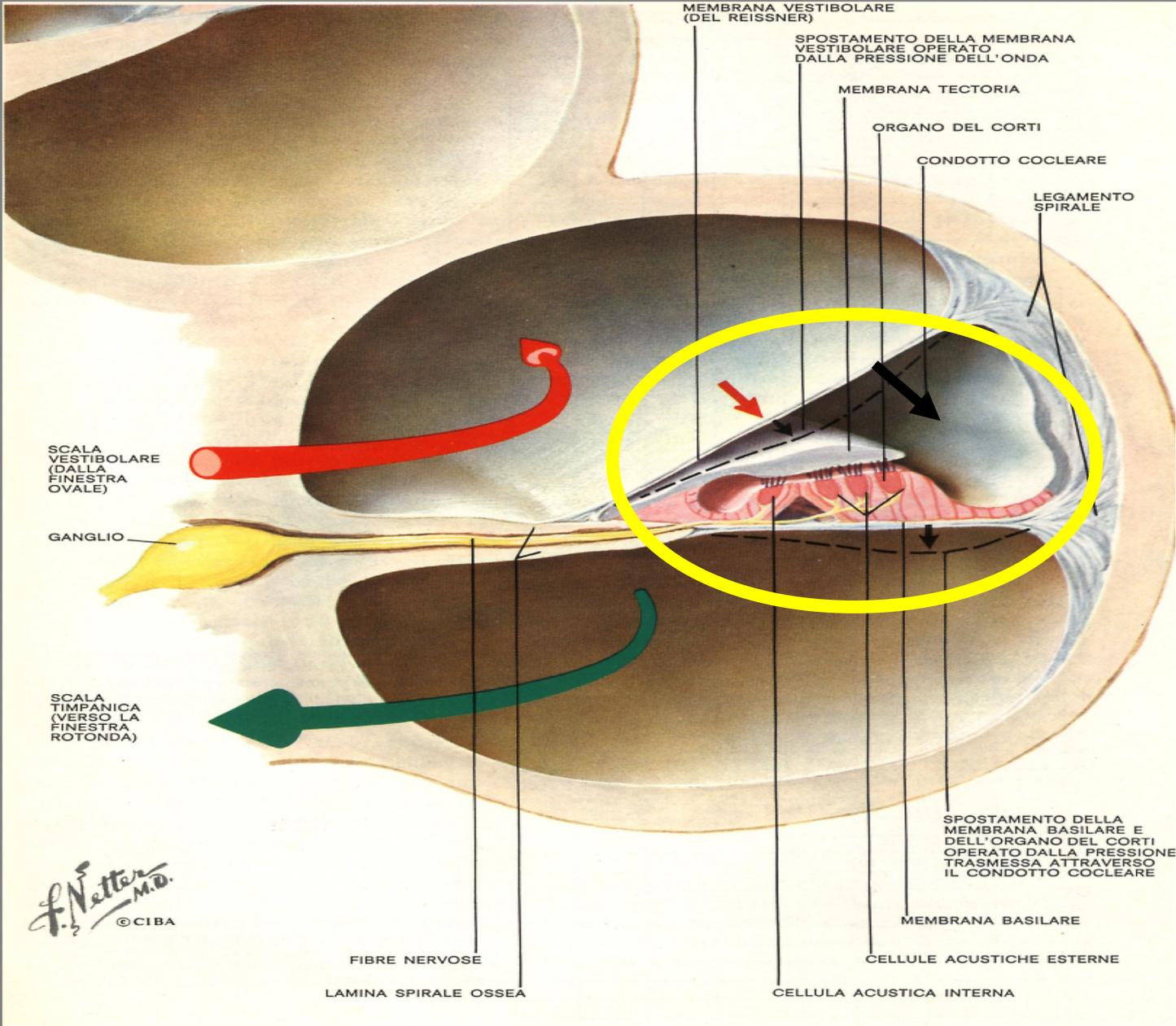


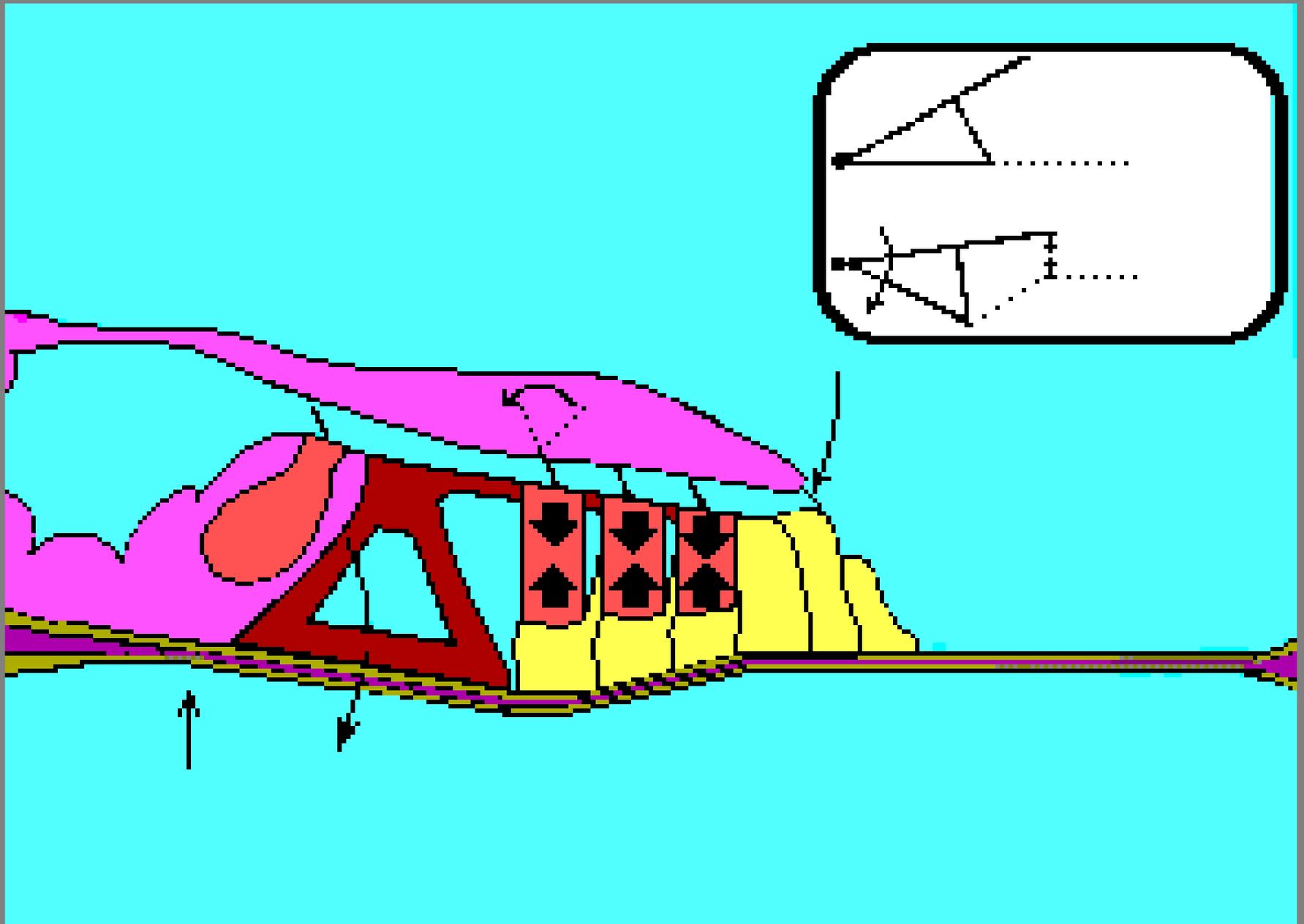
# PROPAGAZIONE DEL SUONO

c.u.e.

Movimento delle particelle d'aria



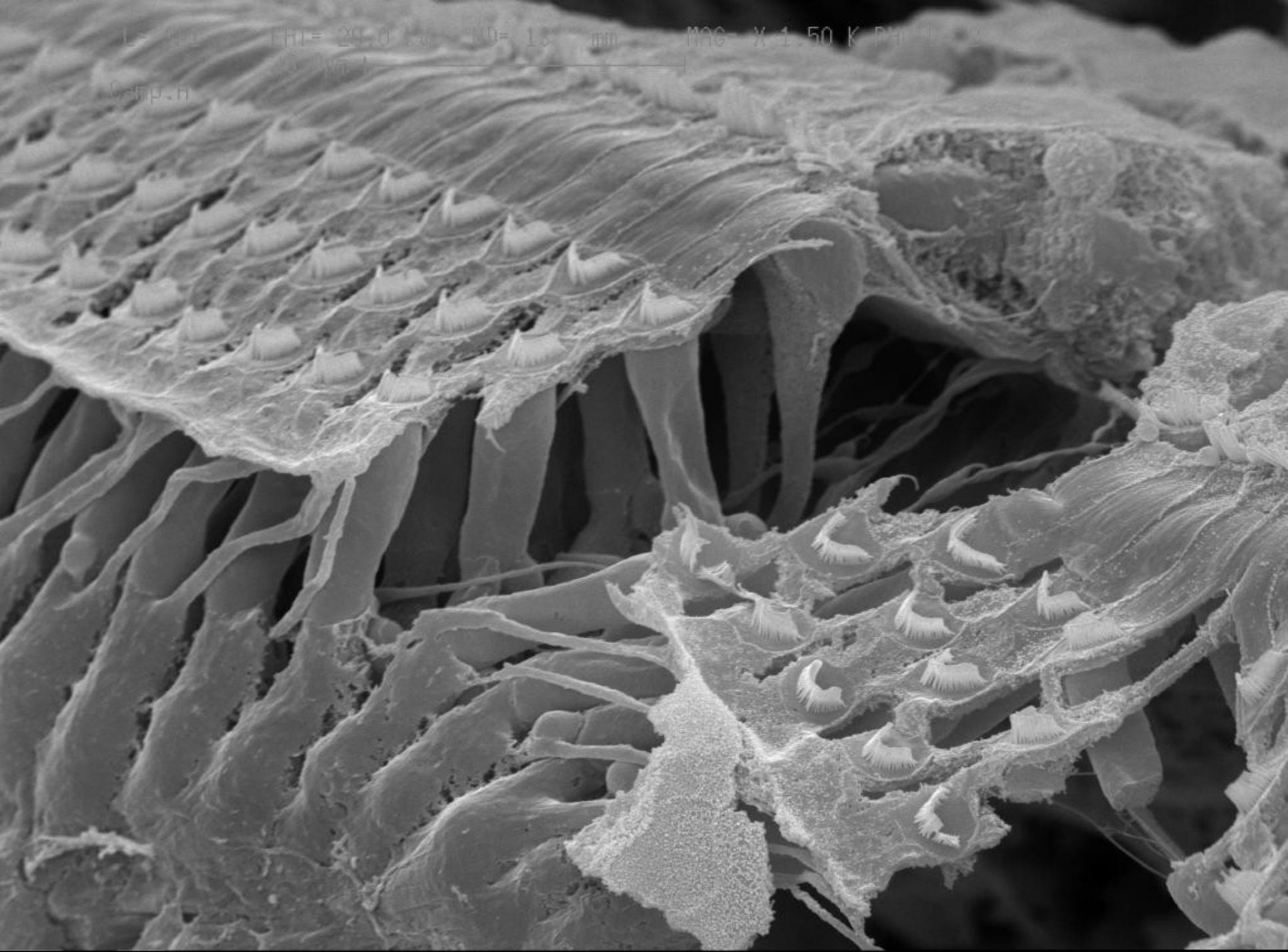




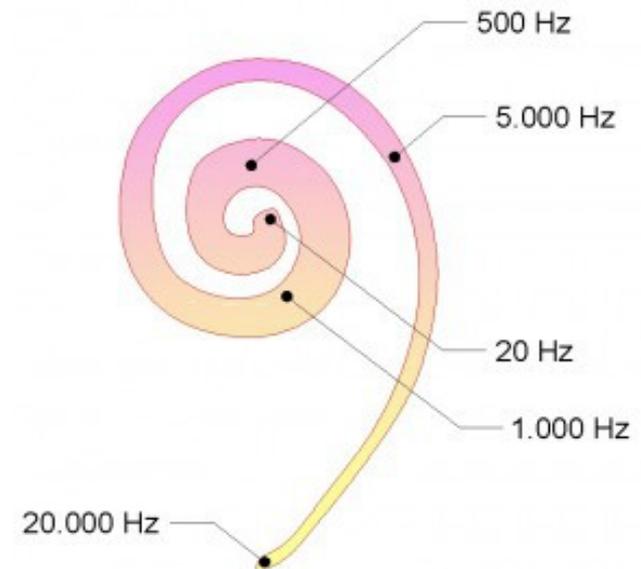
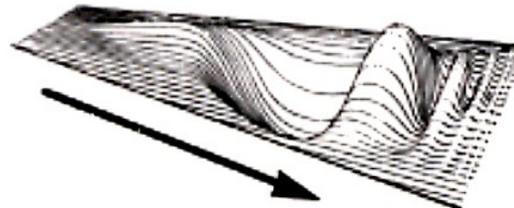
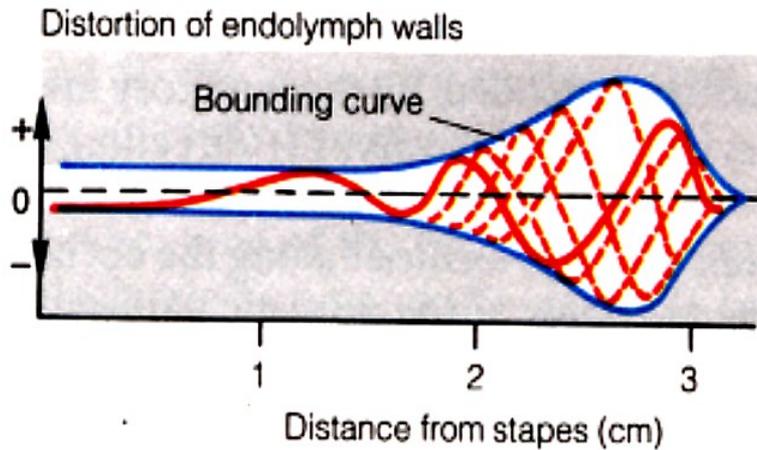
L= 40.0 EHT= 20.0 kV WD= 13.7 mm MAG= X 1.50 K PH= 10.0 V

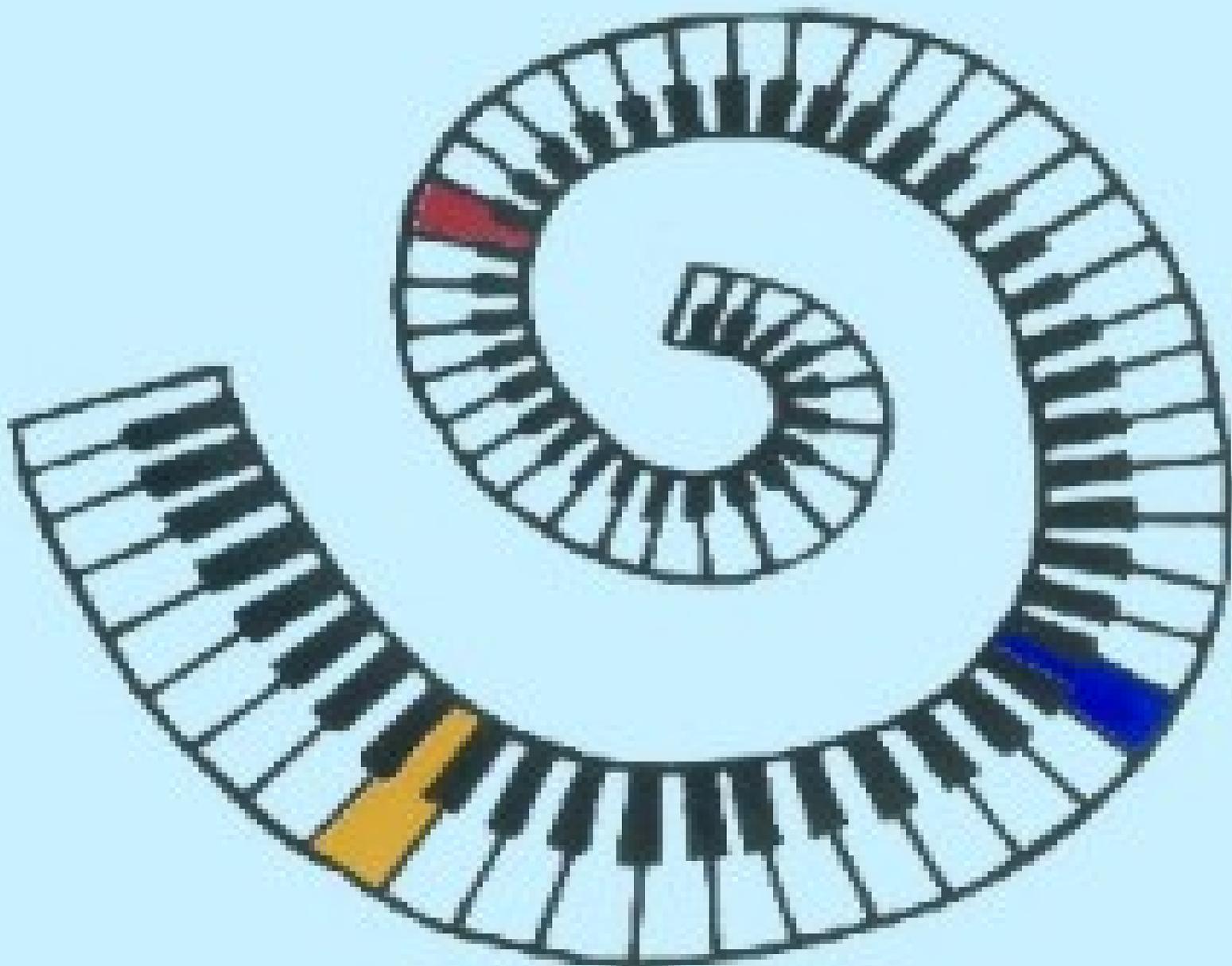
0.5 mm

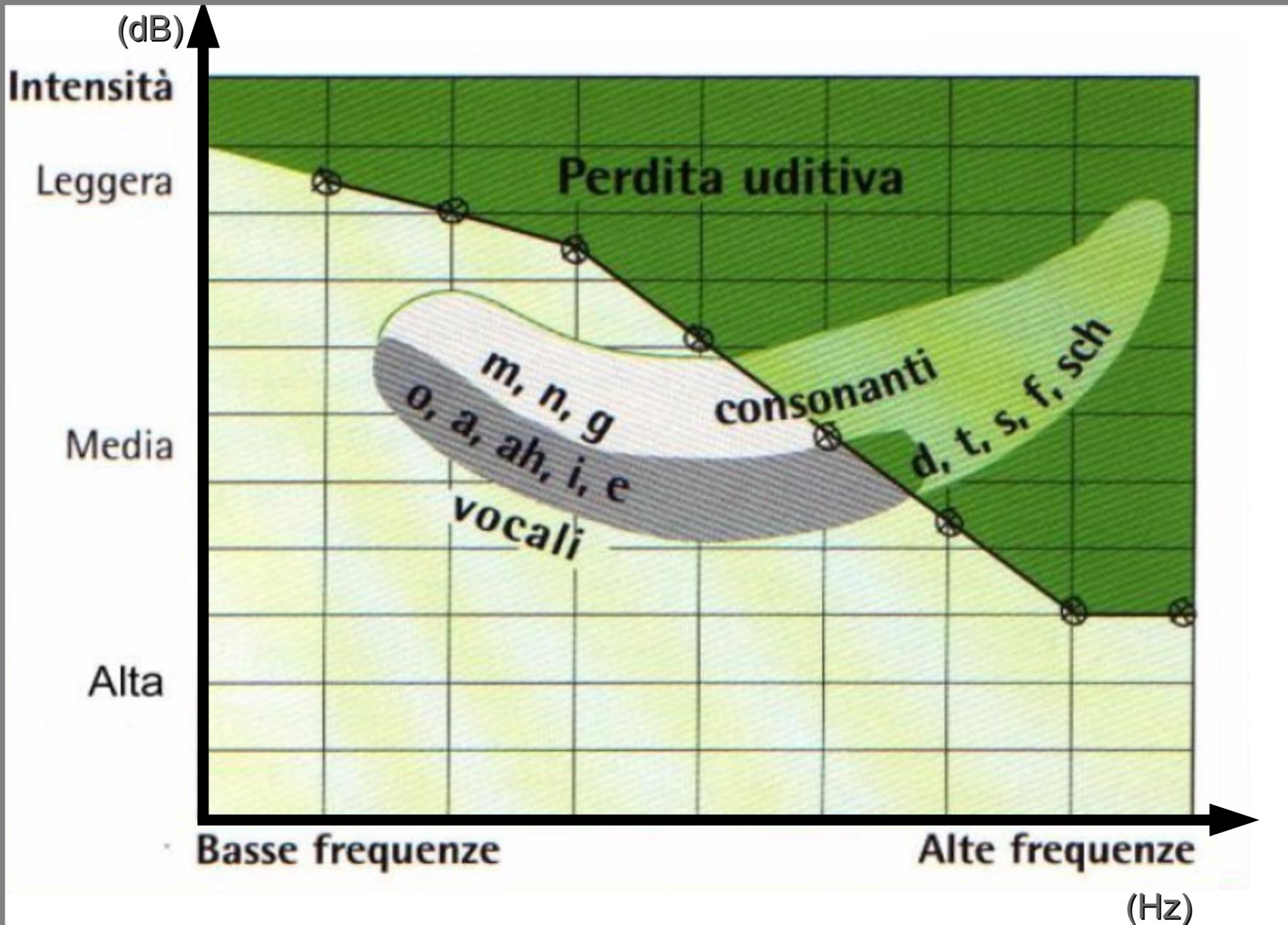
Самр.н



# ***PARTIZIONE DELLE FREQUENZE SULLA MAPPA COCLEARE***

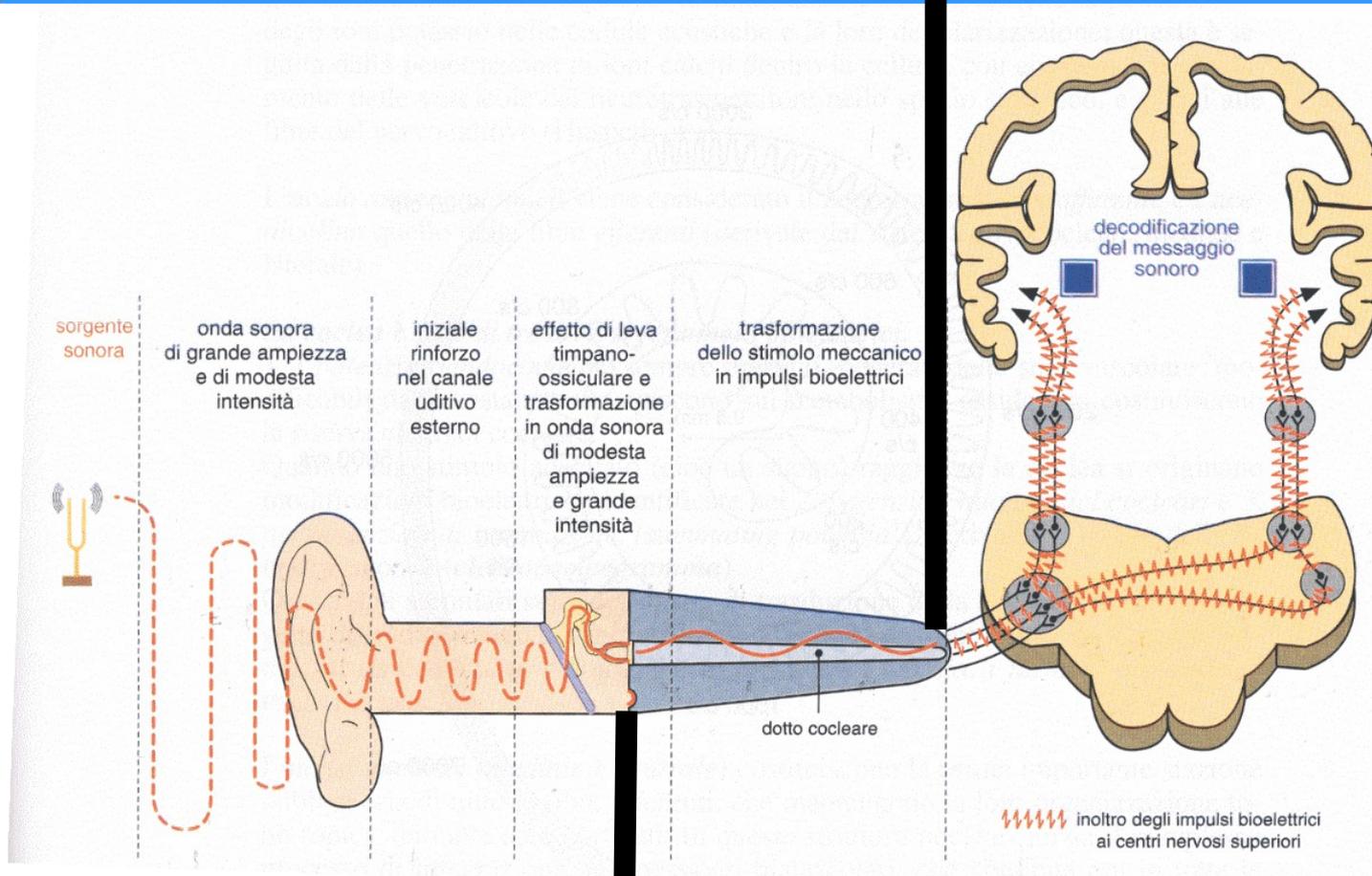






## Sordità Periferica

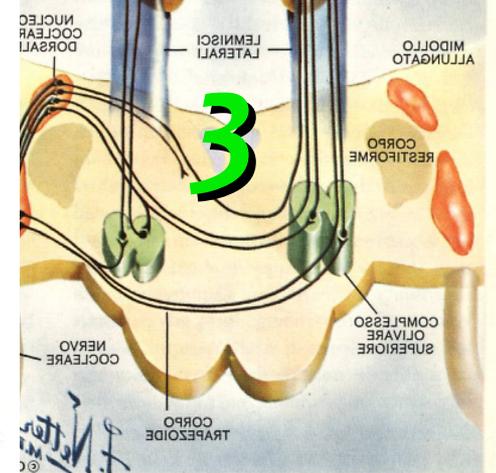
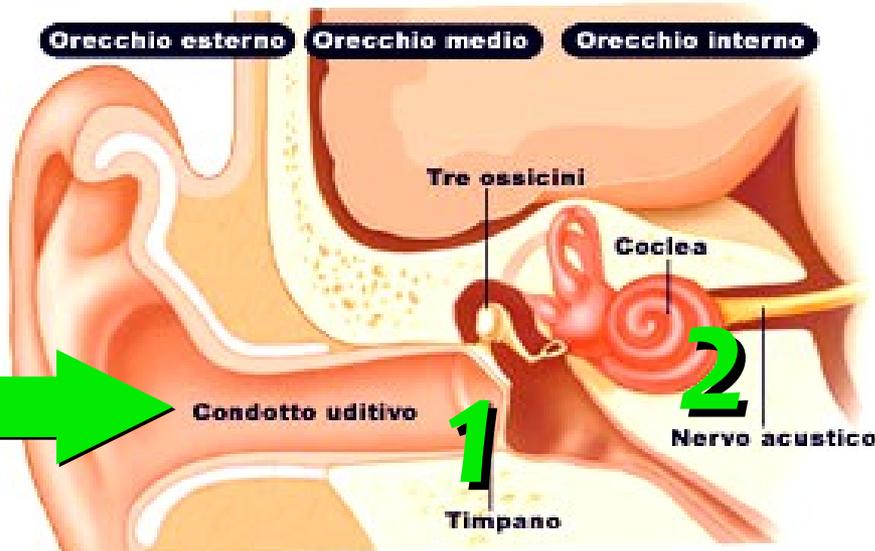
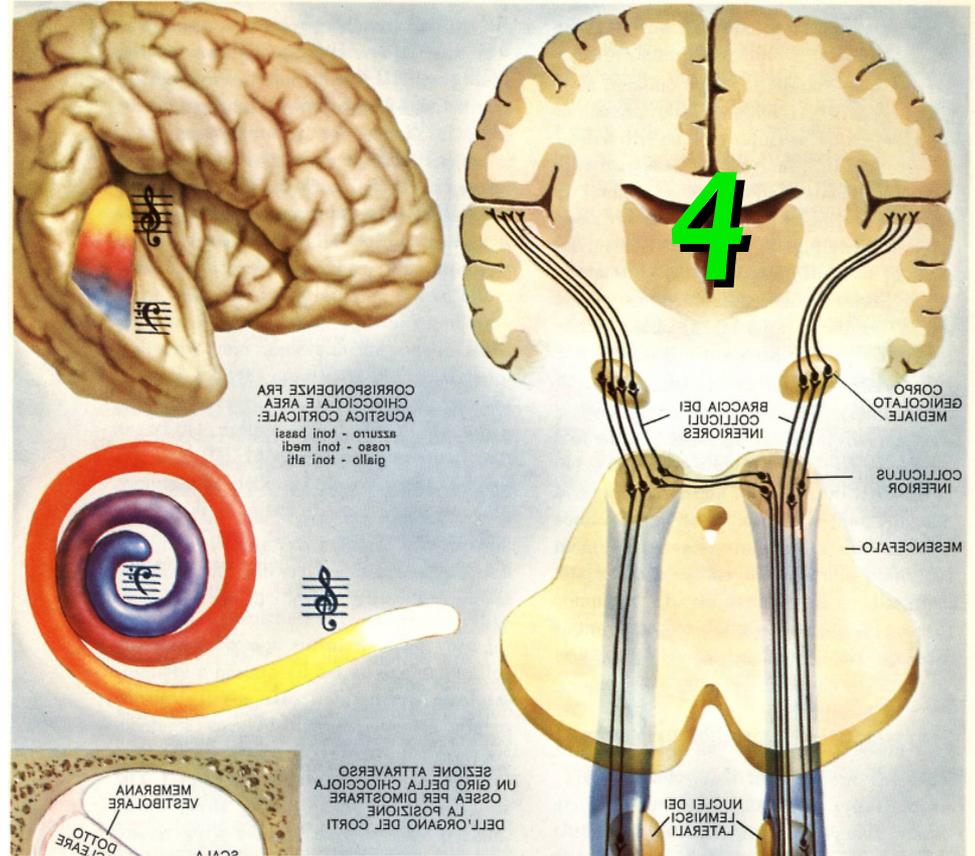
## Sordità Centrale



(1) Sordità  
trasmissiva

(2) Sordità  
Neurosensoriale

# INQUADRAMENTO DIAGNOSTICO AUDIOLOGICO



# INQUADRAMENTO DIAGNOSTICO AUDIOLOGICO

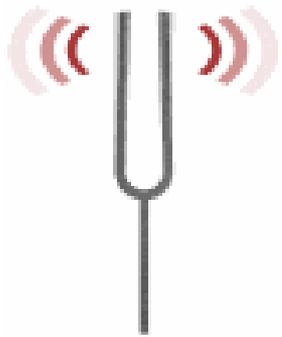
(ACUMETRIA)?

AUDIOMETRIA TONALE

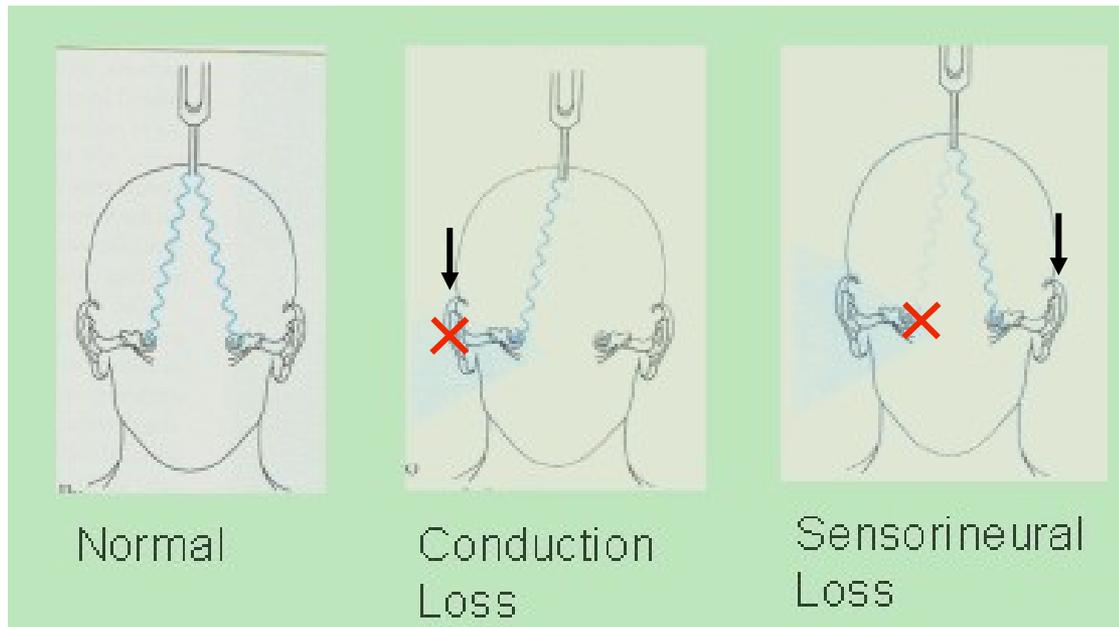
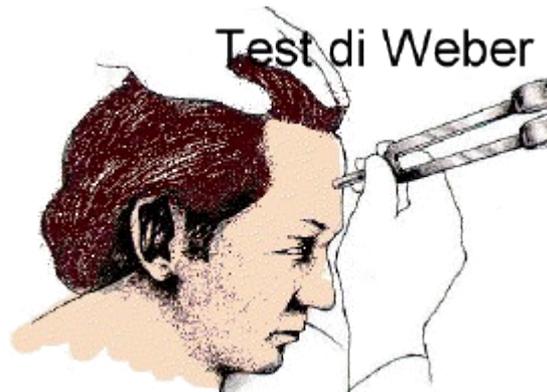
AUDIOMETRIA VOCALE

IMPEDENZOMETRIA

POTENZIALI EVOCATI



# ACUMETRIA



# **INQUADRAMENTO DIAGNOSTICO AUDIOLOGICO**

(ACUMETRIA)?

**AUDIOMETRIA TONALE**

AUDIOMETRIA VOCALE

IMPEDENZOMETRIA

POTENZIALI EVOCATI

# DIAGNOSI AUDIOLOGICA

## Audiometria tonale



Limiti di udibilità umana: 16 - 20.000 Hz

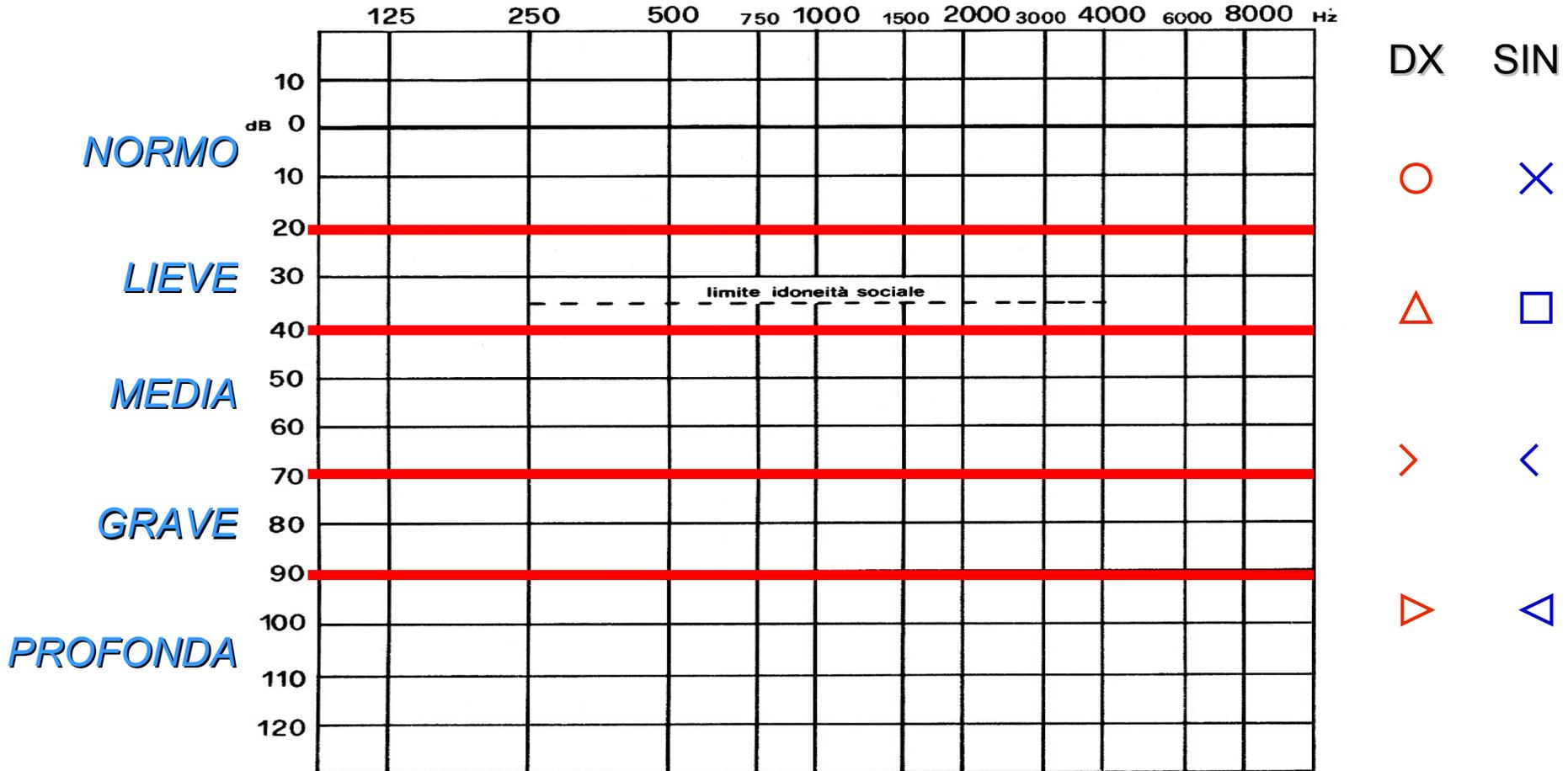
Frequenze indagate nella pratica clinica:

128-256-512-1024-2048-4096-8192 Hz (“do” della scala naturale)

Arrotondamento a 125-250-500-1000-4000-8000 Hz

Frequenze intermedie: 3000-6000 Hz (valore medico-legale)

# Audiometria tonale



WHO (World Health Organization), 1980

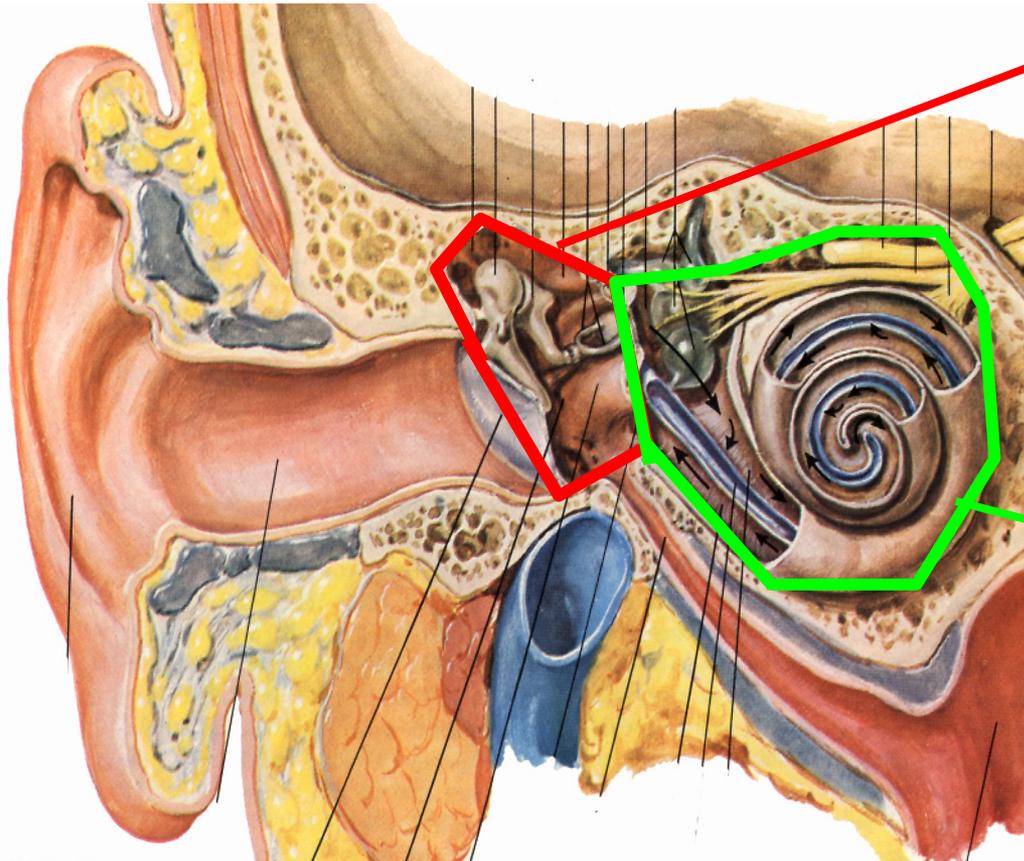
BIAP (Bureau International d'Audiophonologie), 1996

# Audiometria tonale

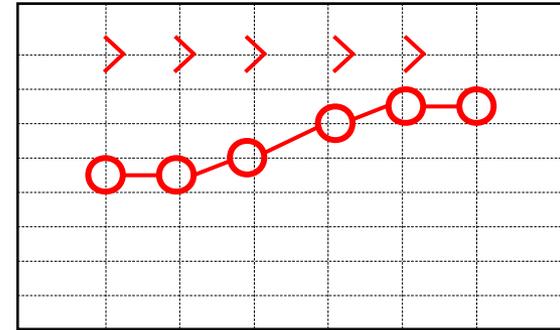
## *ESECUZIONE TEST*

- VA: 1000-2000-4000-8000-3000-500-250-125 Hz; si inizia dall'orecchio migliore, poi eventualmente Contralateral Masking (CM) se necessario
- VO: 1000-2000-4000-3000-500-250 sempre Contralateral Masking (CM)
- Metodo “ascendente” – “discendente”
- Tono continuo - pulsato

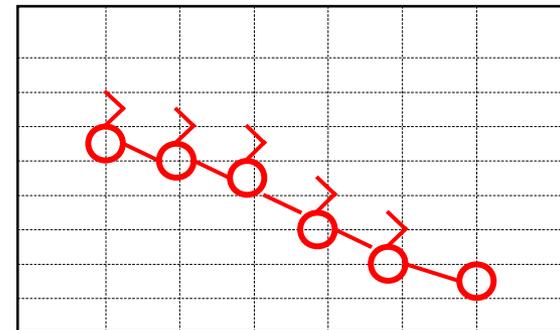
# Audiometria tonale



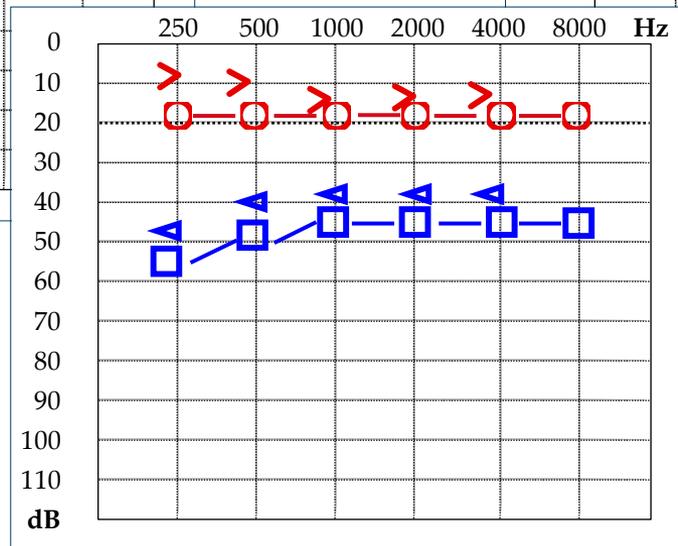
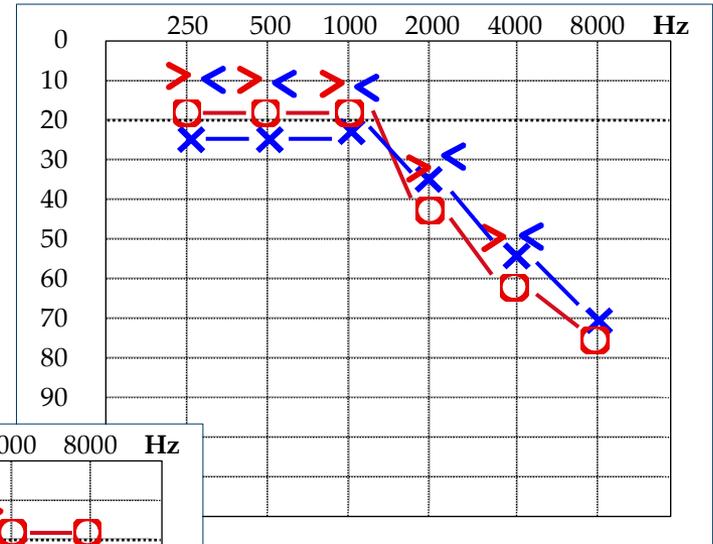
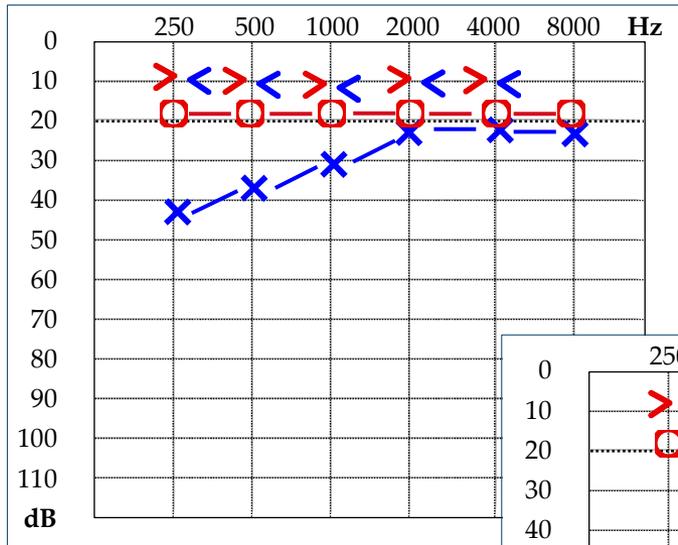
## Ipoacusia Trasmissiva



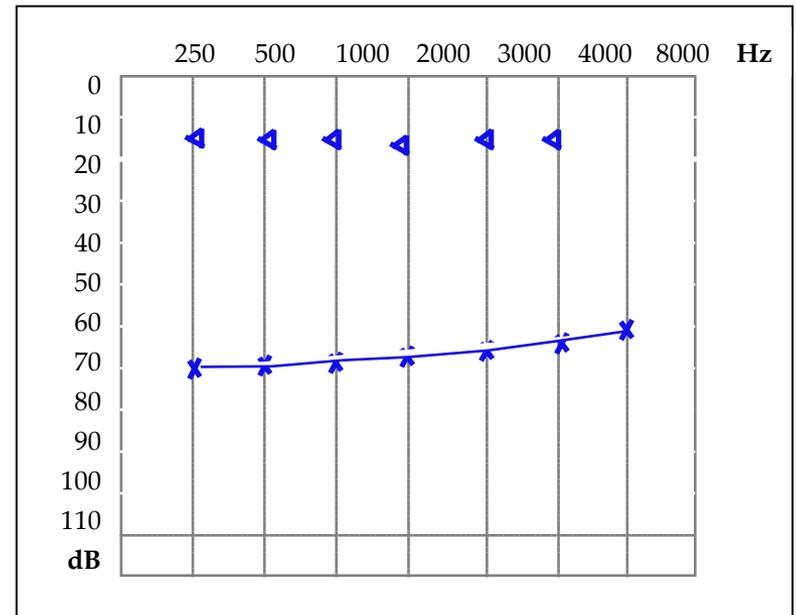
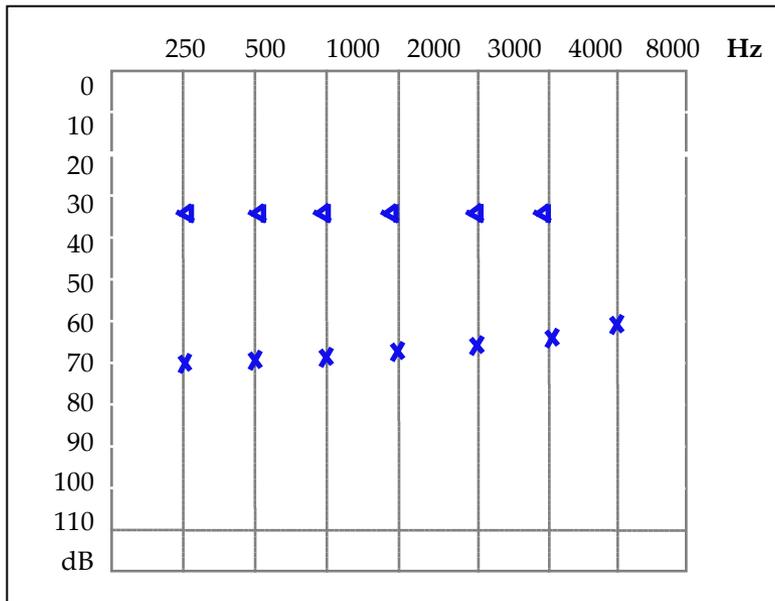
## Ipoacusia neurosensoriale



# Audiometria tonale



# Audiometria tonale



# **INQUADRAMENTO DIAGNOSTICO AUDIOLOGICO**

(ACUMETRIA)?

AUDIOMETRIA TONALE

**AUDIOMETRIA VOCALE**

IMPEDENZOMETRIA

POTENZIALI EVOCATI

# Audiometria vocale

Valutazione della capacità discriminativa del paziente a fini diagnostici o per fitting protesico

## Materiale vocale utilizzato:

FONEMI

LOGOTOMI

PAROLE MONO-BI-TRISILLABICHE

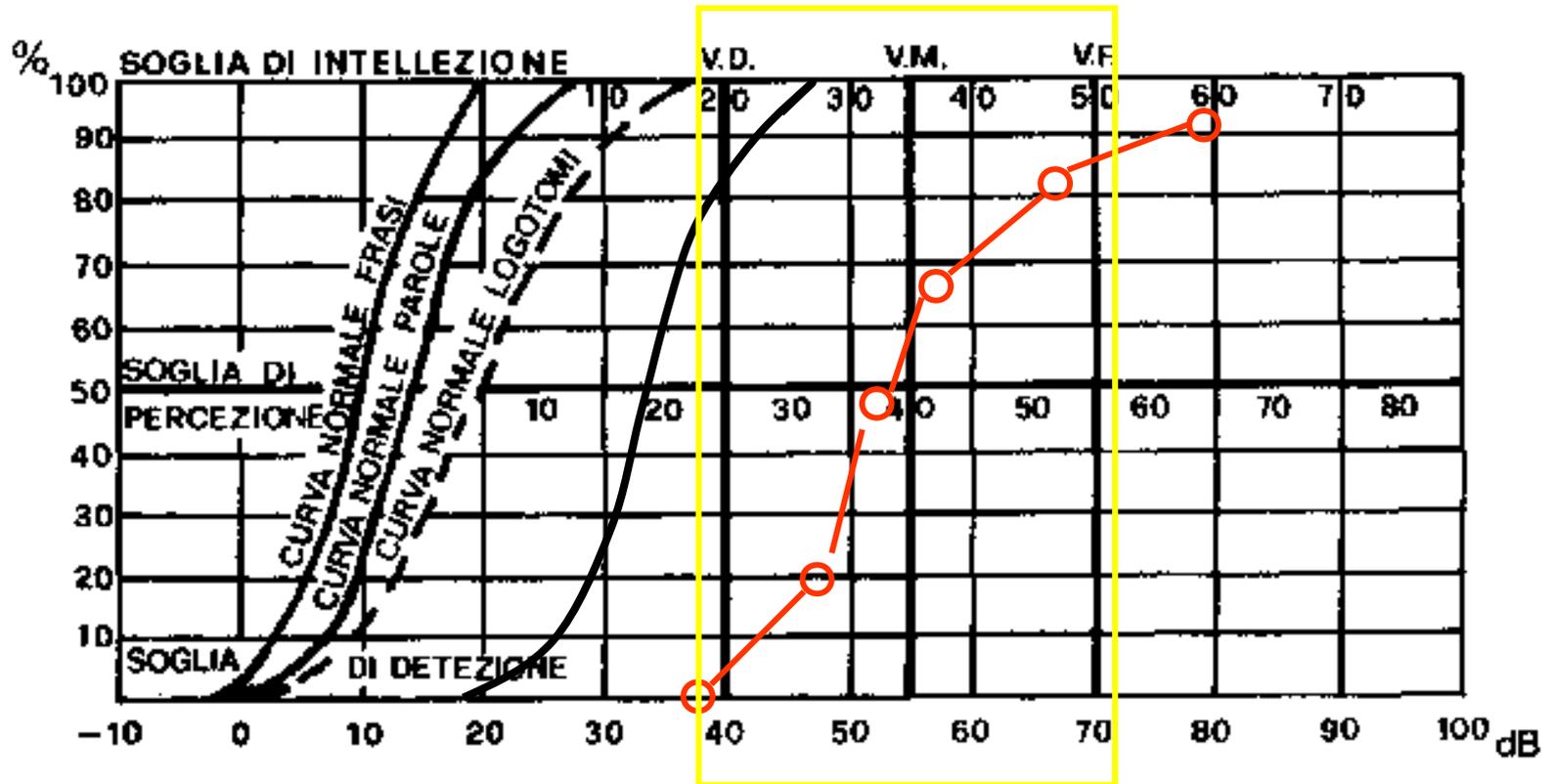
(sec. Azzi, Bocca-Pellegrini, Jergher-Antonelli  
per l'adulto; sec. Rimondini-Rossi per l'età  
infantile)

# Audiometria tonale

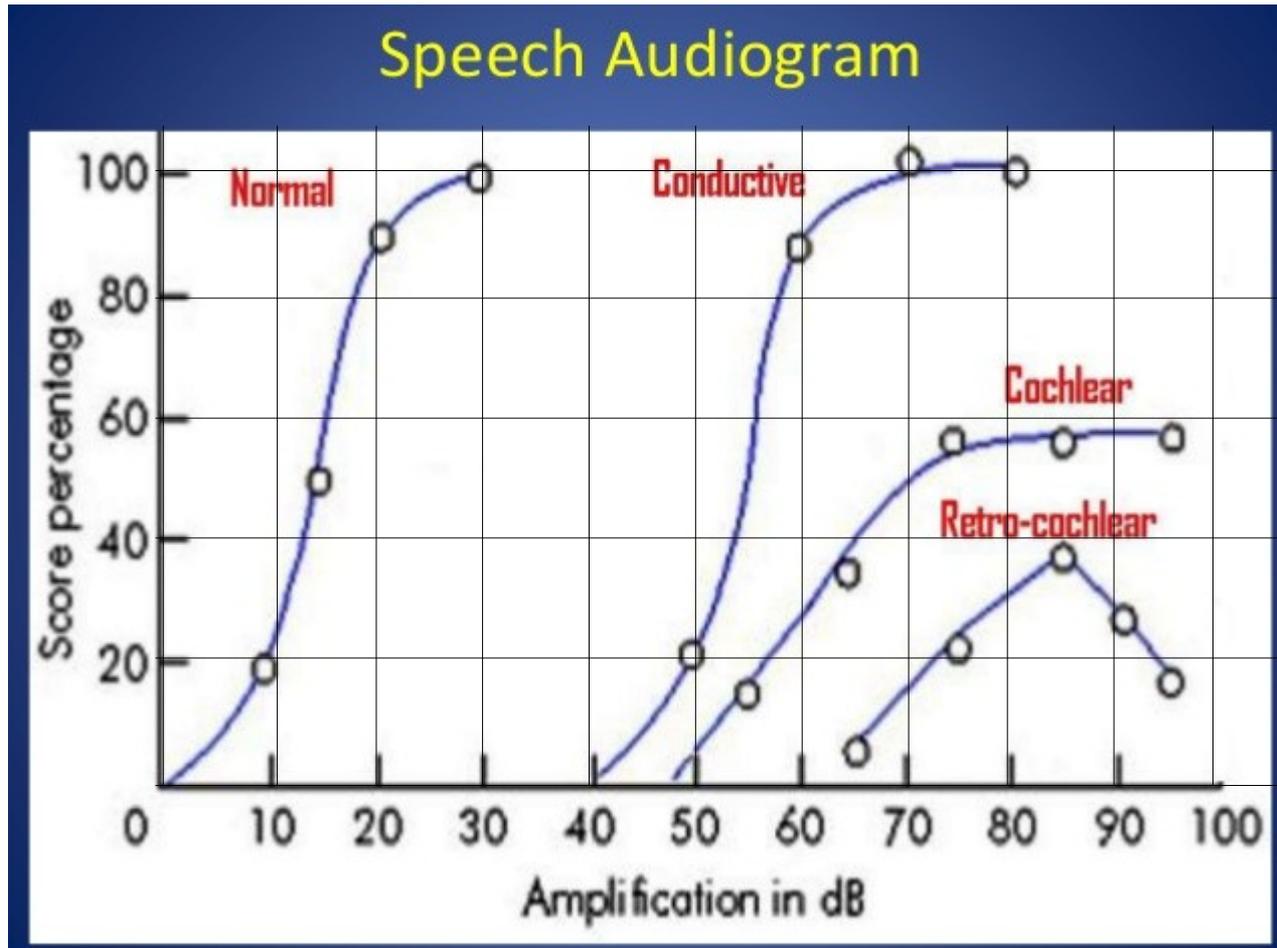
## Materiale vocale

- **FONEMI**: unità fonologiche lingua-specifiche che differiscono per un solo elemento distintivo (es. “LINO”- “PINO”)
- **LOGOTOMI**: unità fonemiche senza significato, a tonalità grave (es. “KALI”- “LURI”- “REVA”-ecc), mista (es. “KEGI”- “SORI”- “PEFI”-ecc) o acuta (es. “CIZU”- “FEFU”- “SICE”, ecc)
- **PAROLE BISILLABICHE** a senso compiuto (es. “CIELO”-”ERA”-”TORDO”, ecc); raramente parole mono- o trisillabiche.
- **FRASI**:
  - 1) SENSO NON COMPIUTO (es. “DAL PONTE FRENA LA LIRA CON OZIO”-ecc);
  - 2) SENSO COMPIUTO (es. “I GARIBALDINI PORTAVANO LA CAMICIA ROSSA” - ecc)

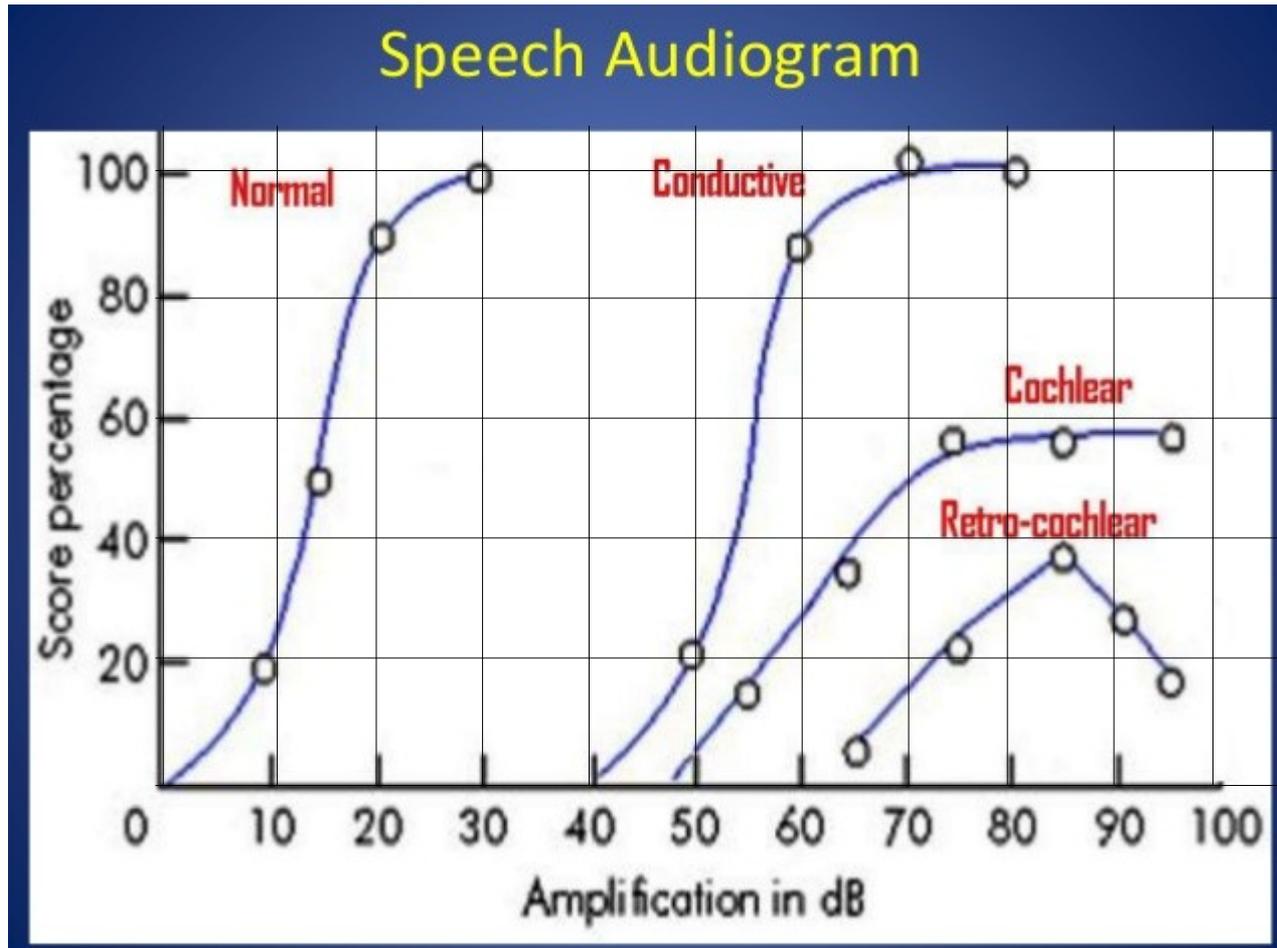
# Audiogramma tonale



# Audiogramma tonale



# Audiogramma tonale



# Audiogramma tonale

- SOGLIA DI INTELLERZIONE: intelligibilità del materiale presentato (%)
- SOGLIA DI PERCEZIONE: livello d'intensità (dB) che consente il 50% di intelligibilità
- SOGLIA DI DETEZIONE: livello di intensità (dB) che corrisponde alla percezione minima del materiale presentato senza però riuscire a ripeterlo correttamente

**CUFFIA / CABINA / CAMPO LIBERO**

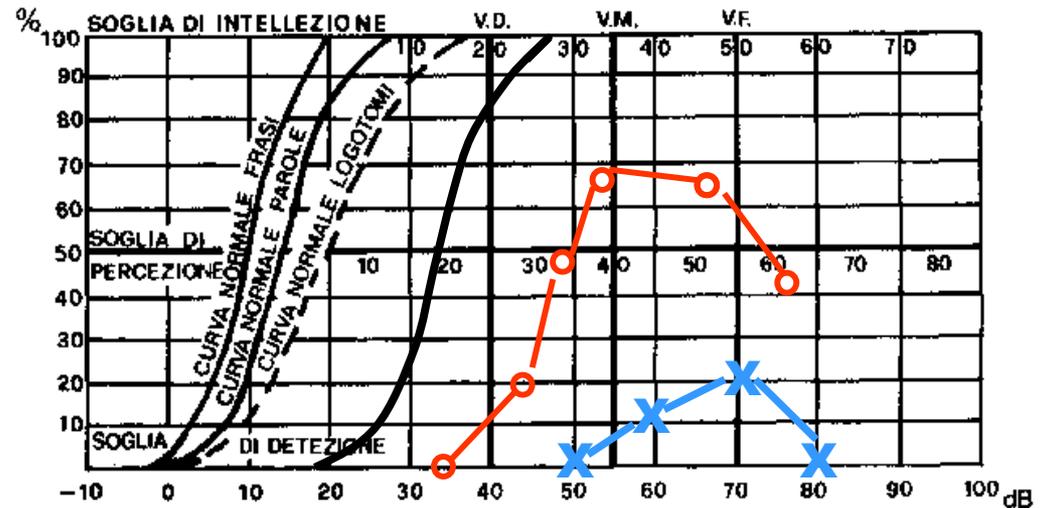
**MASCHERAMENTO**: come per audiometria tonale

# Audiogramma tonale

## “ROLL-OVER”

Riduzione dell'intelligibilità all'aumentare dell'intensità vocale

$$\frac{\text{Discr. Max} - \text{Discr. Min.}}{\text{Discr. max}} \geq 0.45$$



# DIAGNOSI AUDIOLOGICA

(ACUMETRIA)

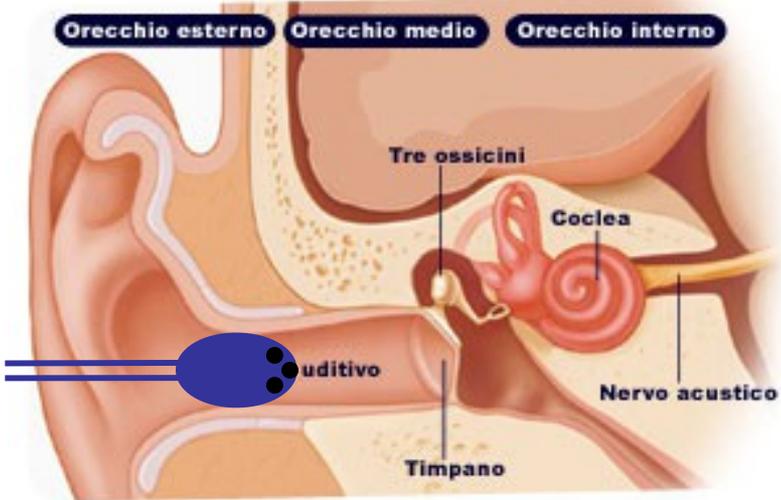
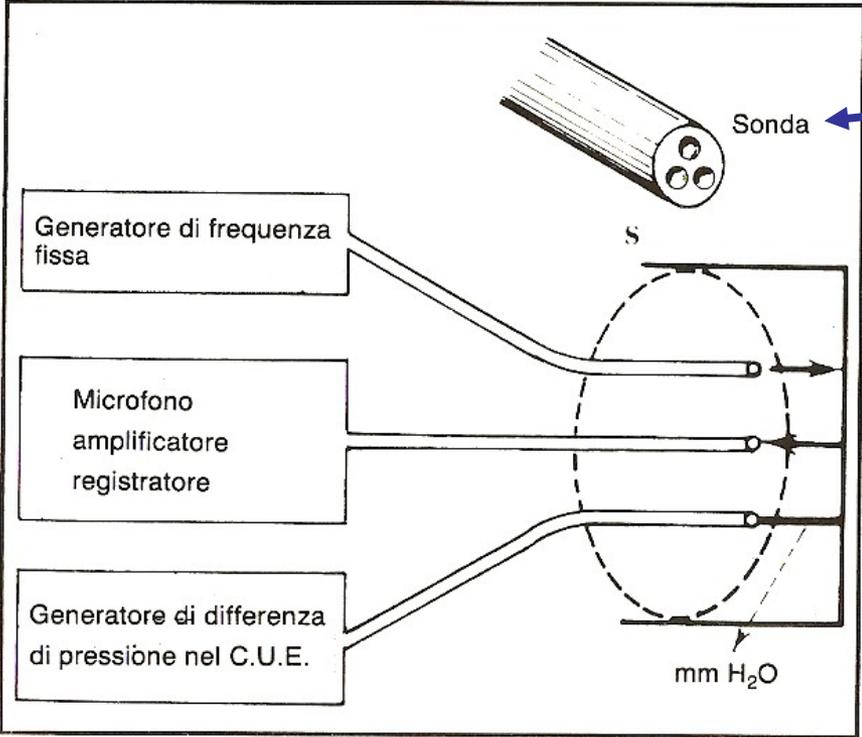
AUDIOMETRIA TONALE

AUDIOMETRIA VOCALE

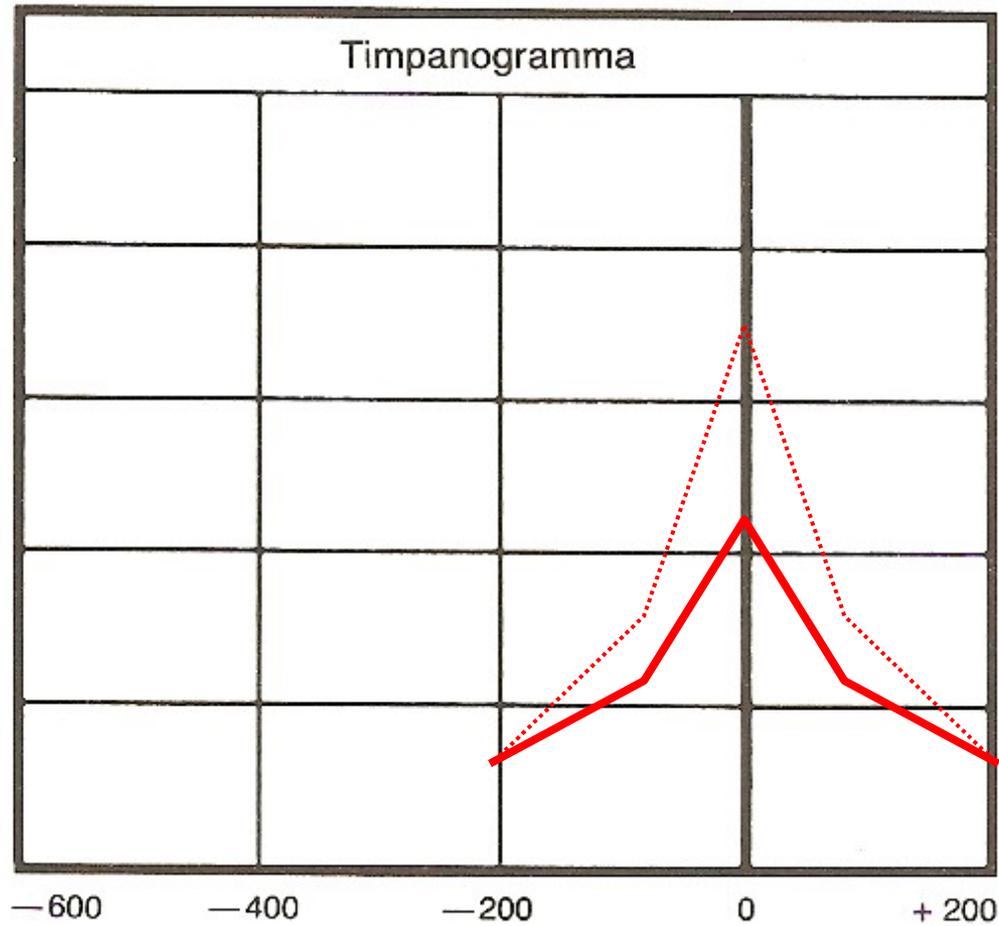
IMPEDENZOMETRIA

POTENZIALI EVOCATI

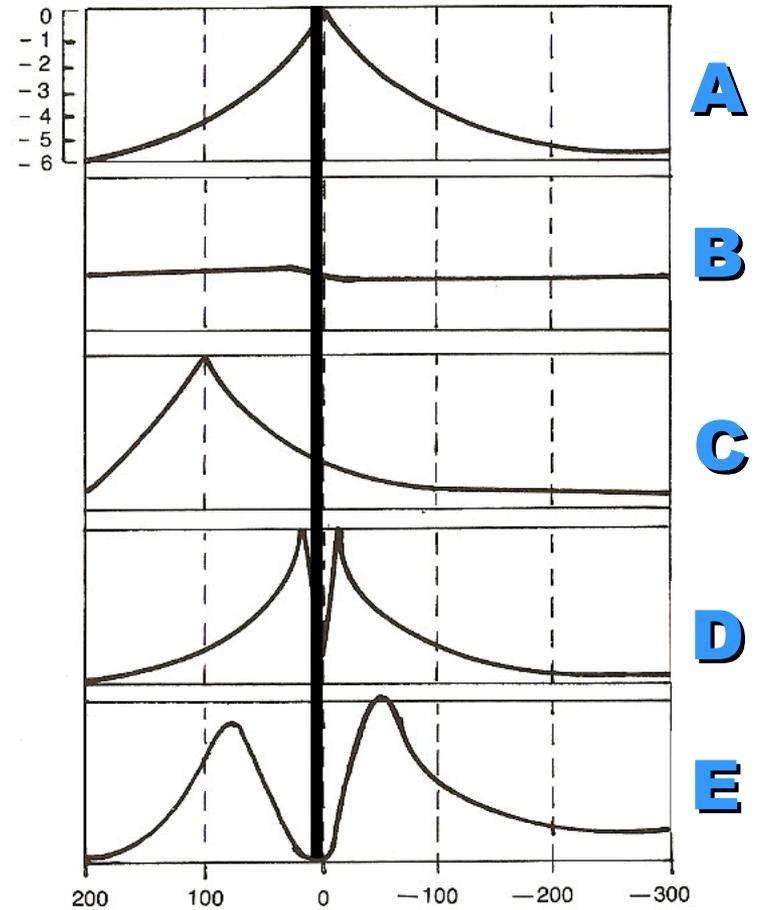
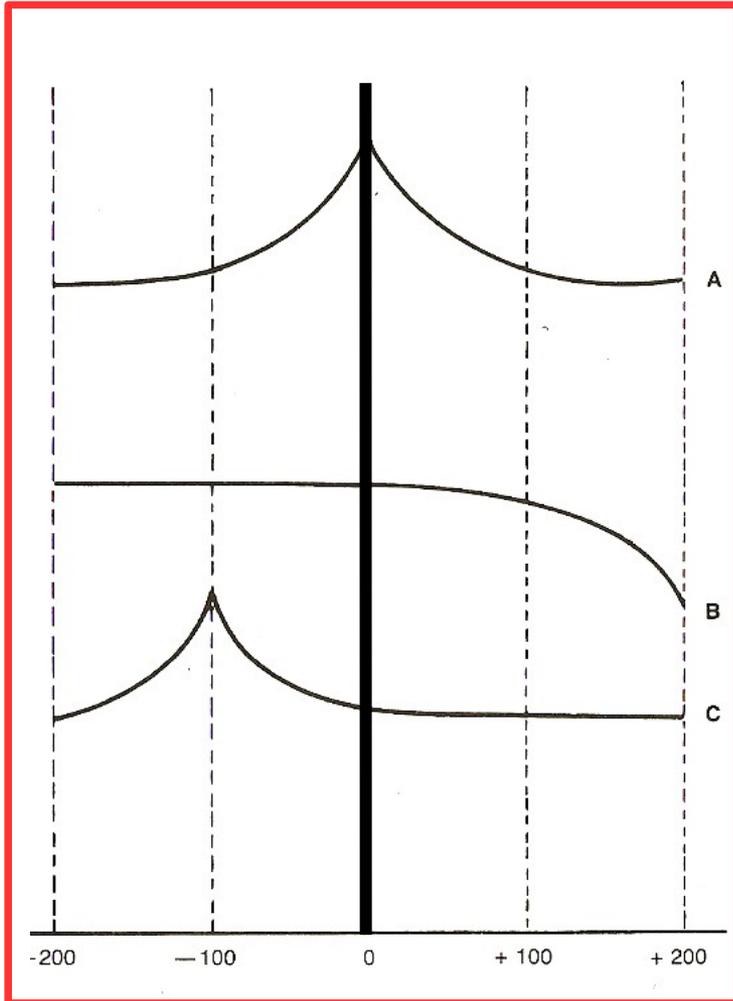
# Impedenzometria



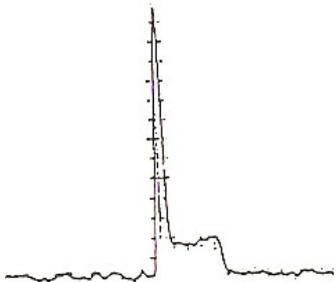
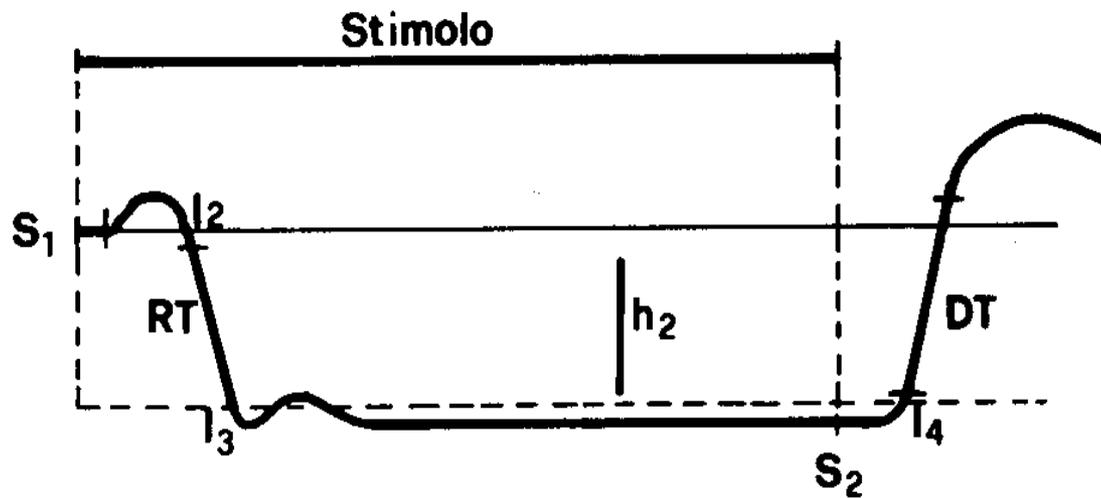
# Impedenzometria



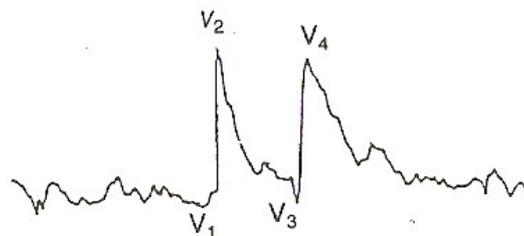
# Timpanogram



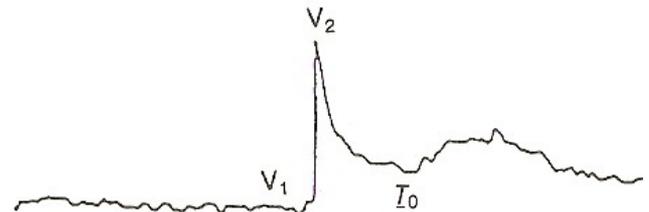
# Reflessometria Stapediale



B



C



# **INQUADRAMENTO DIAGNOSTICO AUDIOLOGICO**

(ACUMETRIA)

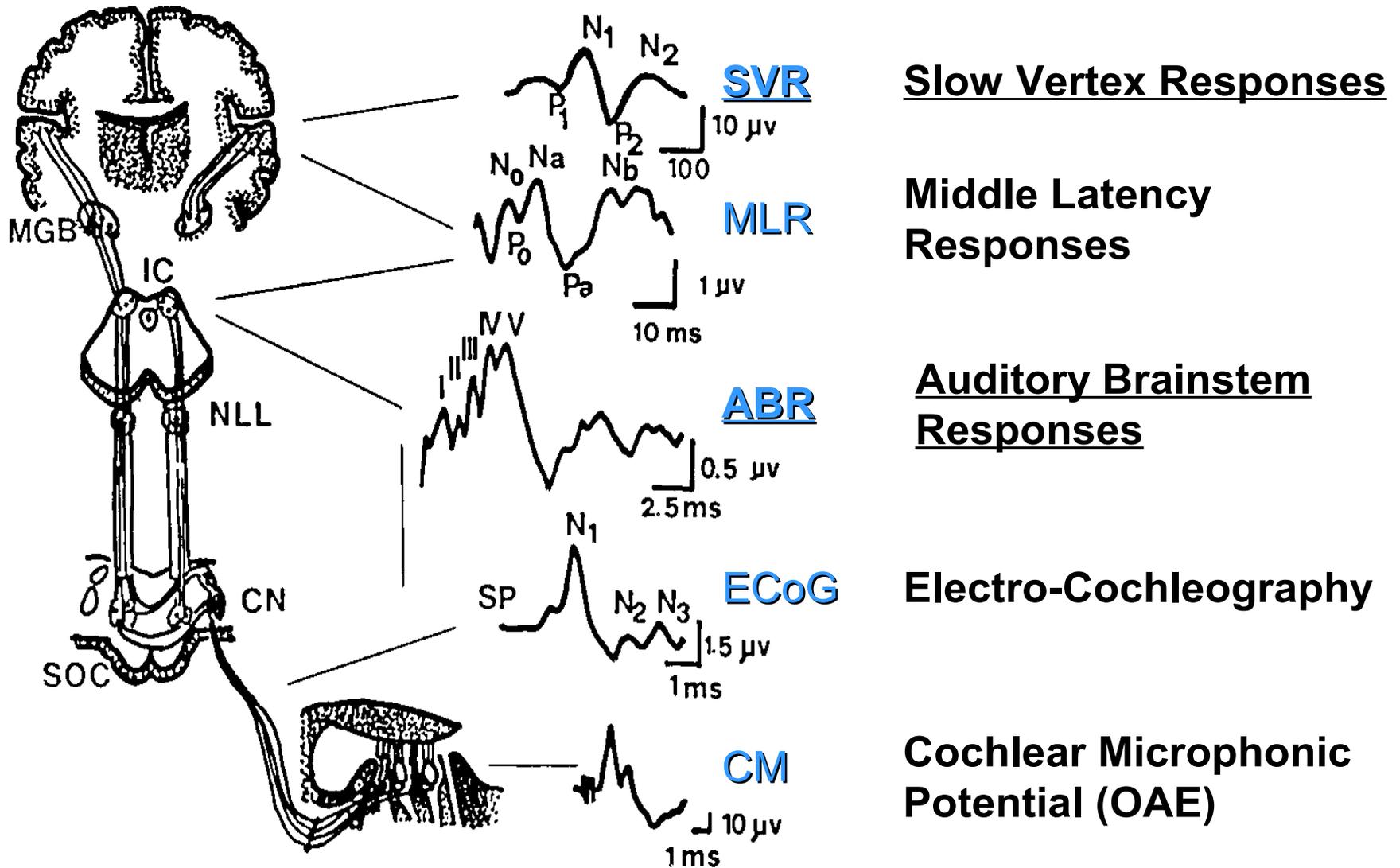
AUDIOMETRIA TONALE

AUDIOMETRIA VOCALE

IMPEDENZOMETRIA

**POTENZIALI EVOCATI**

# POTENZIALI EVOCATI



# Potenziali evocati

## **ACUSTICI** (***ABR – Auditory Brainstem Responses***)

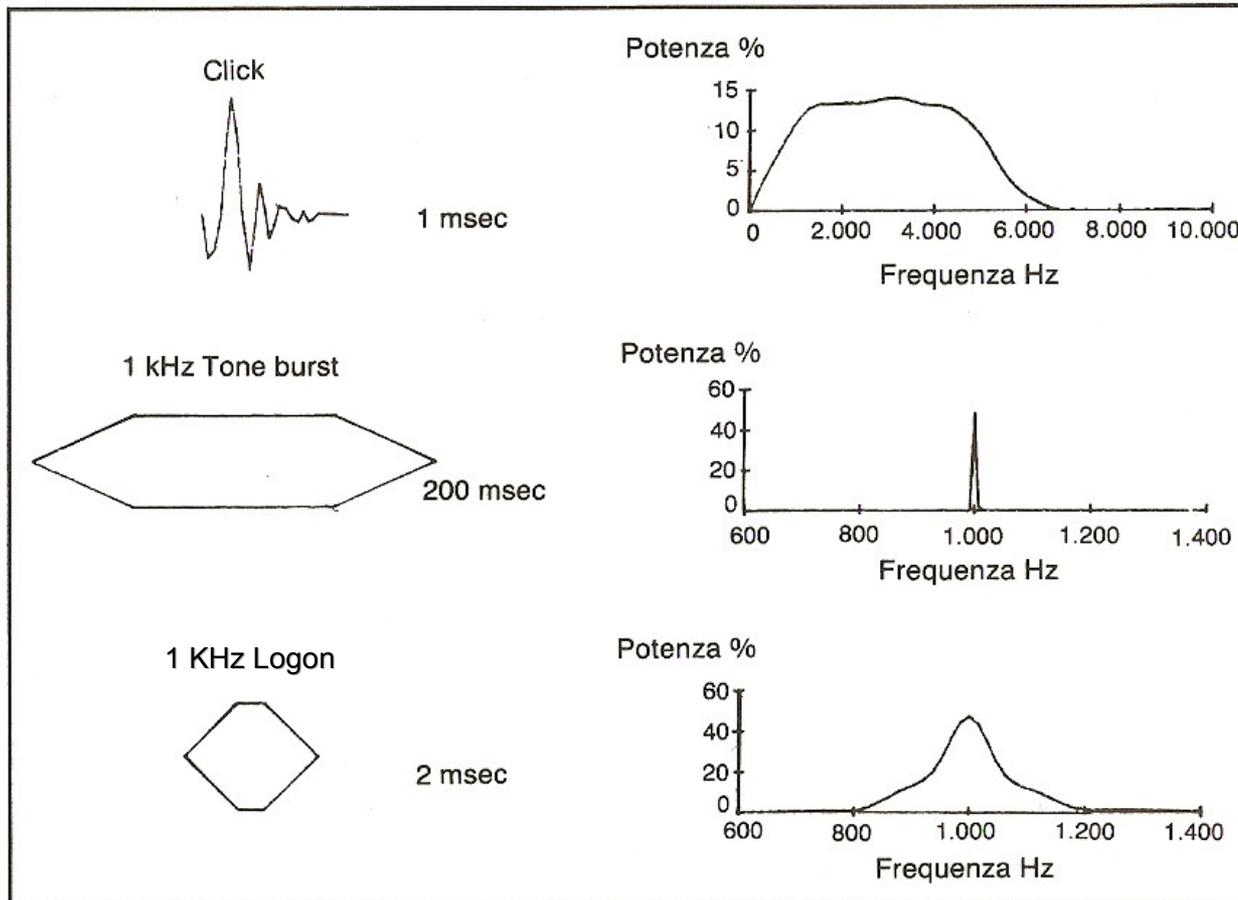
Topodiagnosi funzionale della via acustica centrale

## **UDITIVI**

- **SVR a soglia** (Slow Vertex Responses): calcolo oggettivo della soglia psico-acustica (in genere utilizzato per le frequenze 500 Hz e 1000 Hz)
- **ABR a soglia**: calcolo oggettivo della soglia psico-acustica (in genere utilizzato per le frequenze 2000 - 4000 Hz)

# Potenziali evocati

## Modalità di stimolazione acustica



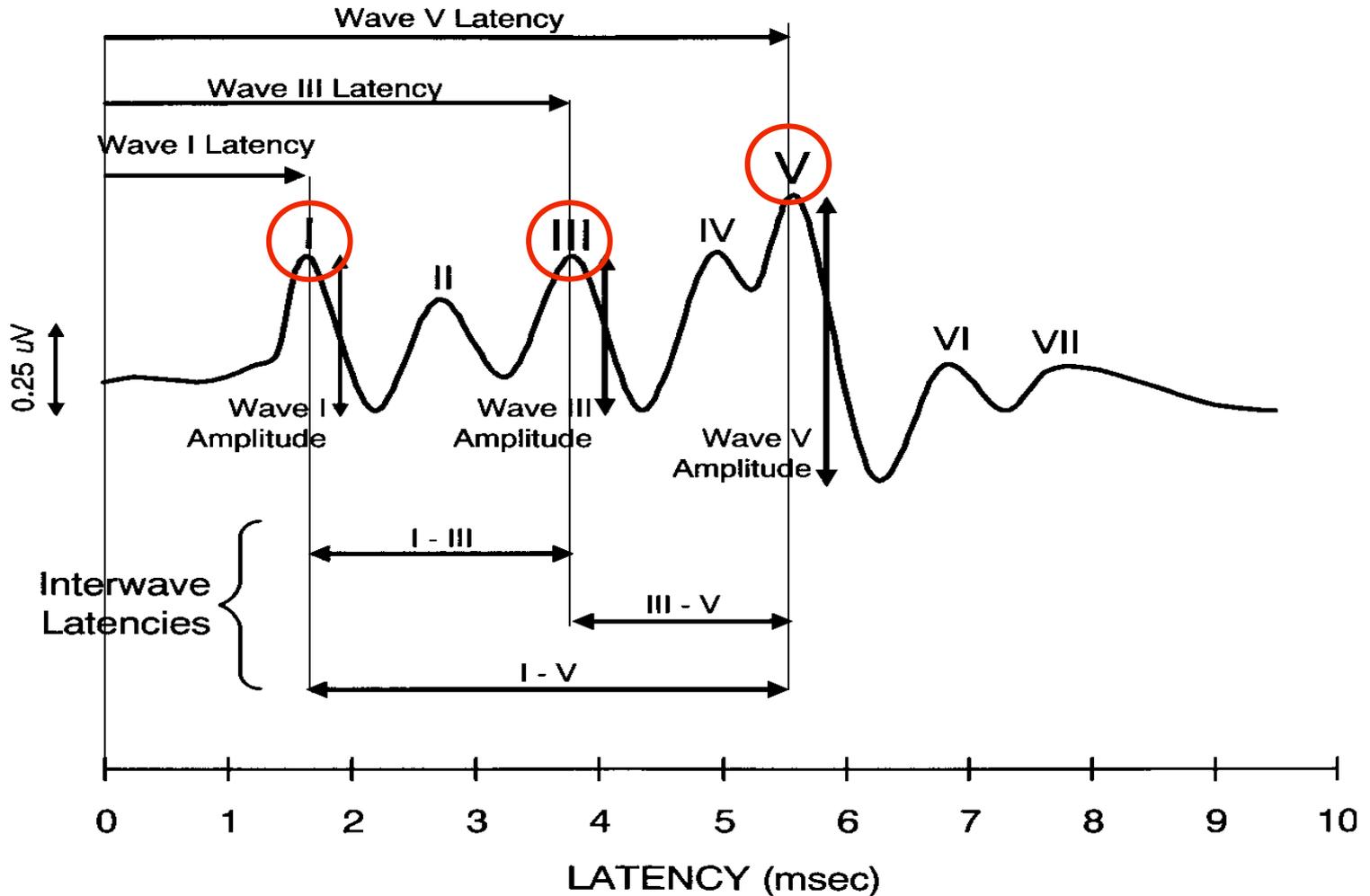
ABR

SVR

(VEMPs)

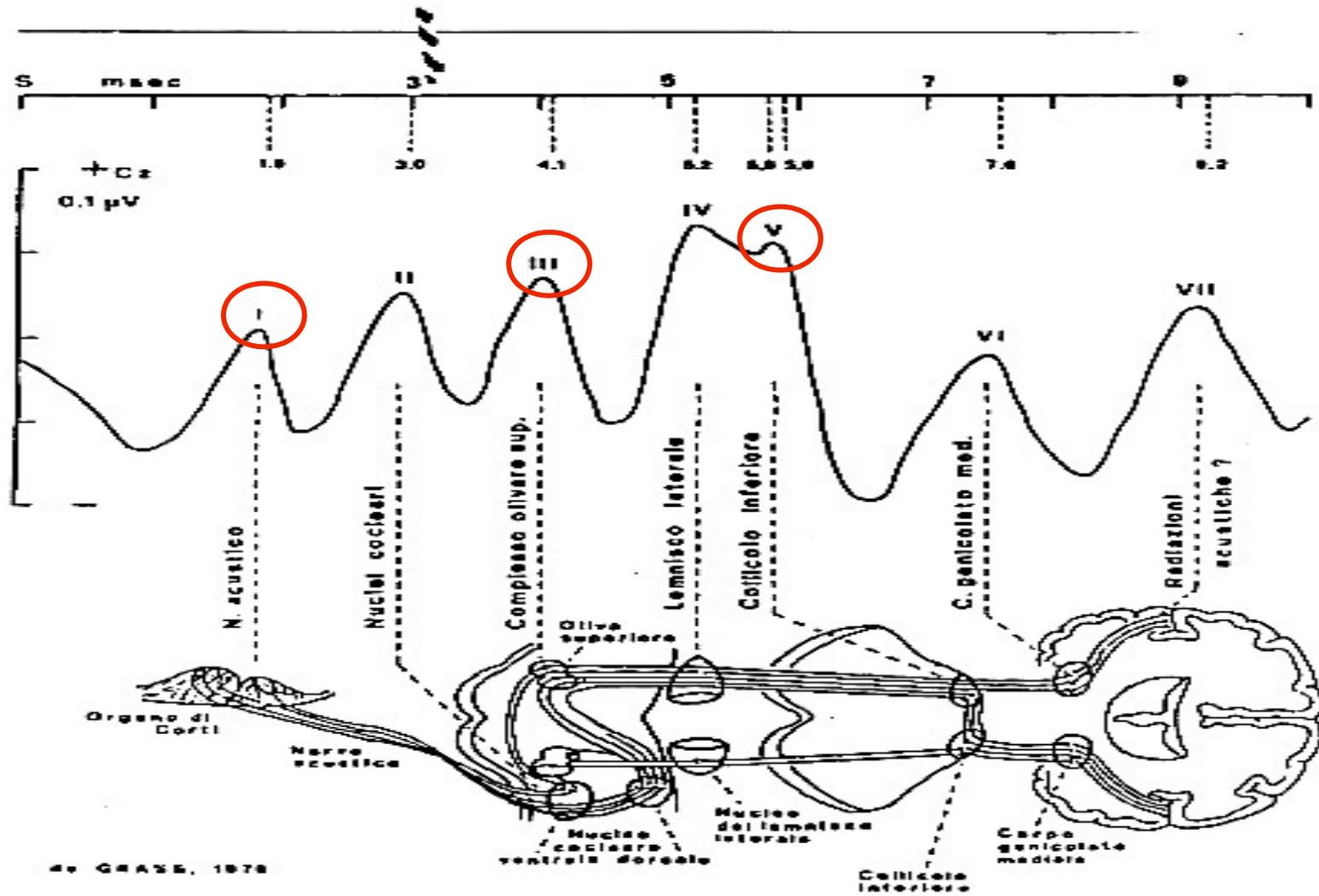
# Potenziali evocati

## Tracciato ABR DIAGNOSTICO



# Potenziali evocati

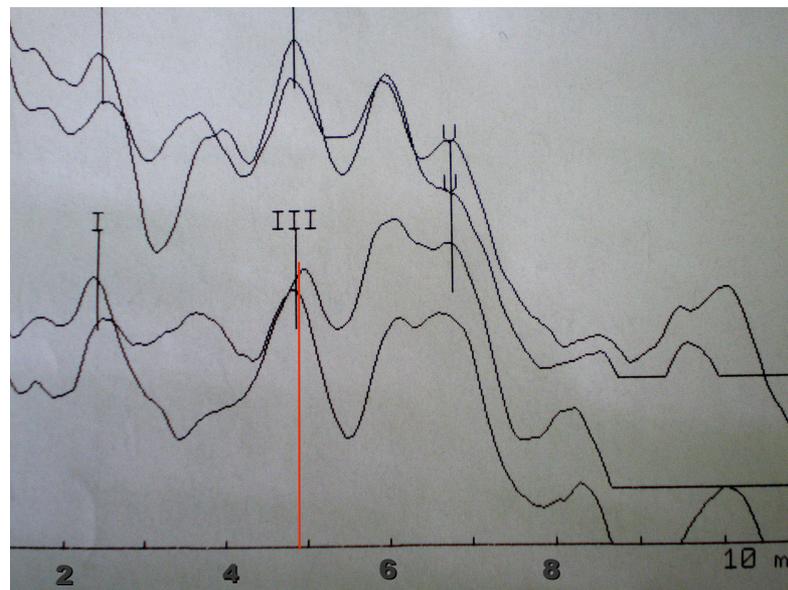
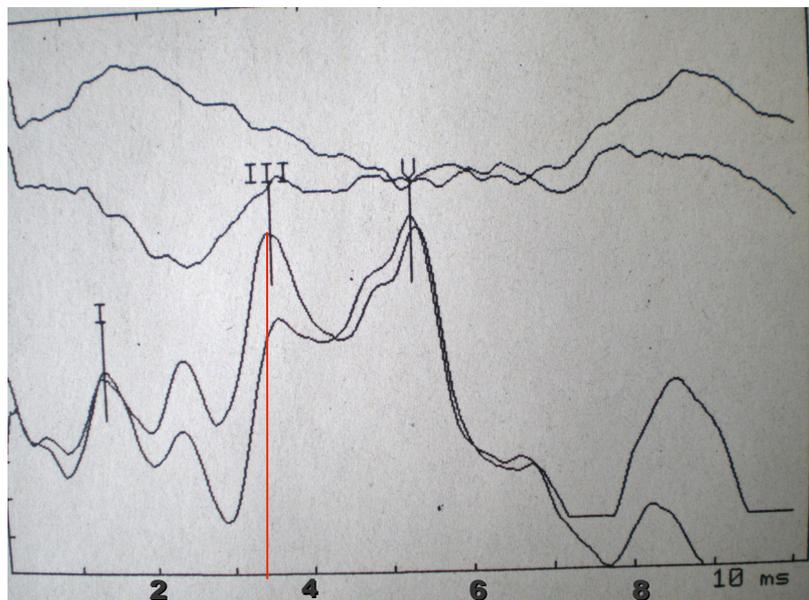
## Tracciato ABR DIAGNOSTICO



49 GRAZS, 1978

# Potenziali evocati

## Tracciato ABR DIAGNOSTICO



### LATENZE

Onda I < 1.9 msec

Interv. I-V < 4.4

Onda III < 3.9 msec

IT5 < 0.4

Onda V < 5.9 msec

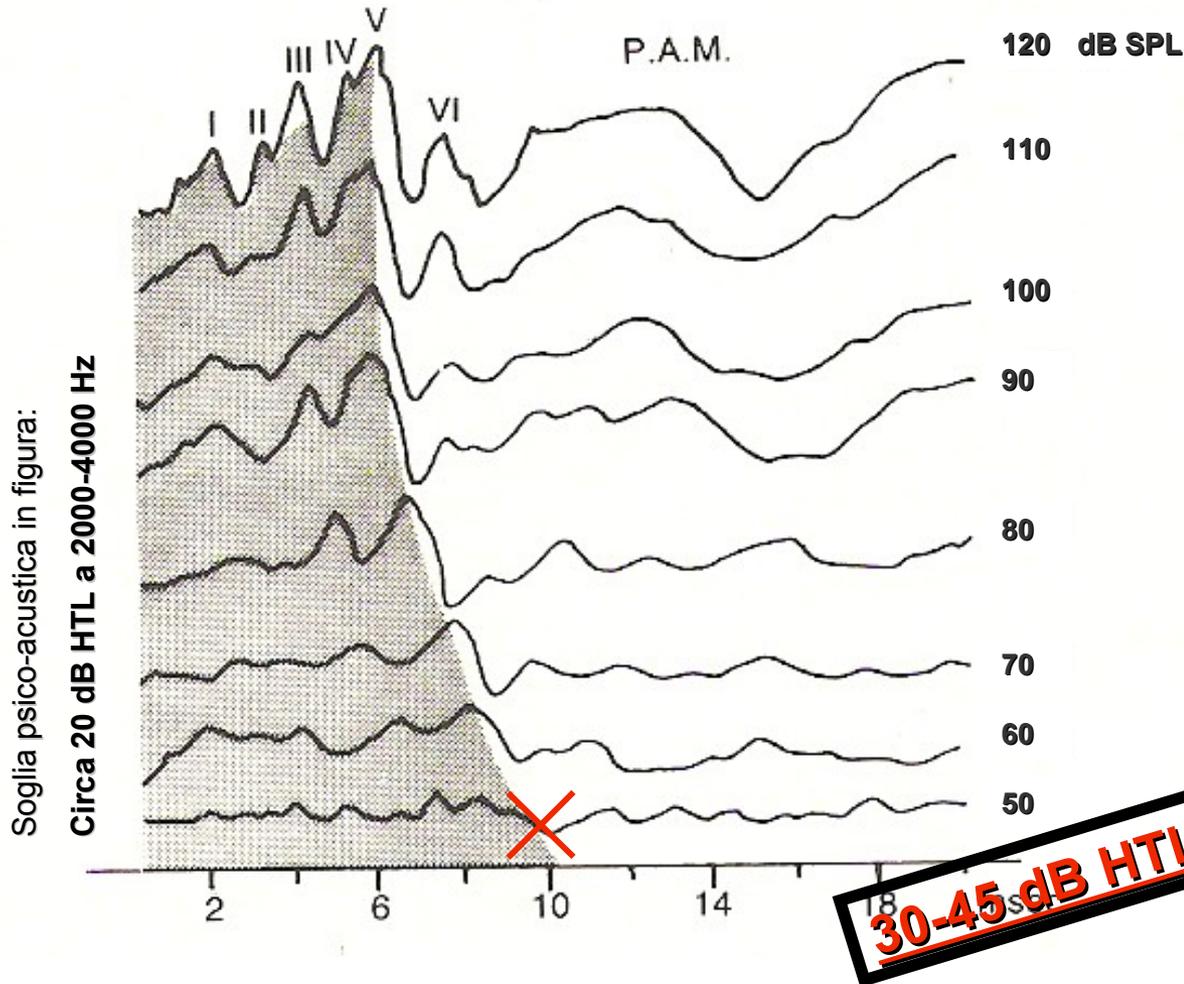
### STIMOLO

Click in cuffia

(Masking)

# Potenziali evocati

## Tracciato ABR A SOGLIA



### Onda V

Latenza aumentata al ridursi dello stimolo, fino a scomparsa

Correzione: meno 15-30 da dB SPL (registrati) a dB HTL (soglia psico-acustica effettiva)

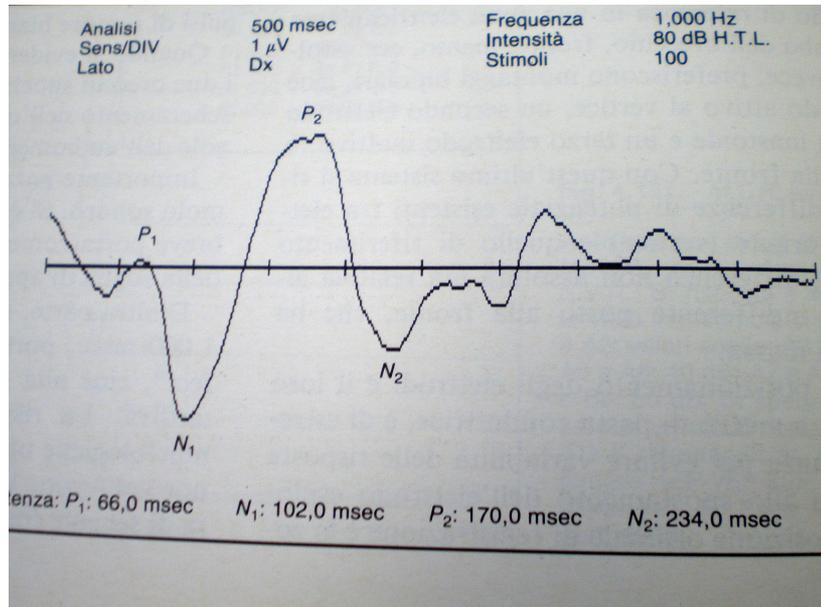
### STIMOLO

Tone burst in cuffia

(Masking)

# Potenziali evocati

## Tracciato SVR A SOGLIA



### Complesso P1N1

#### STIMOLO:

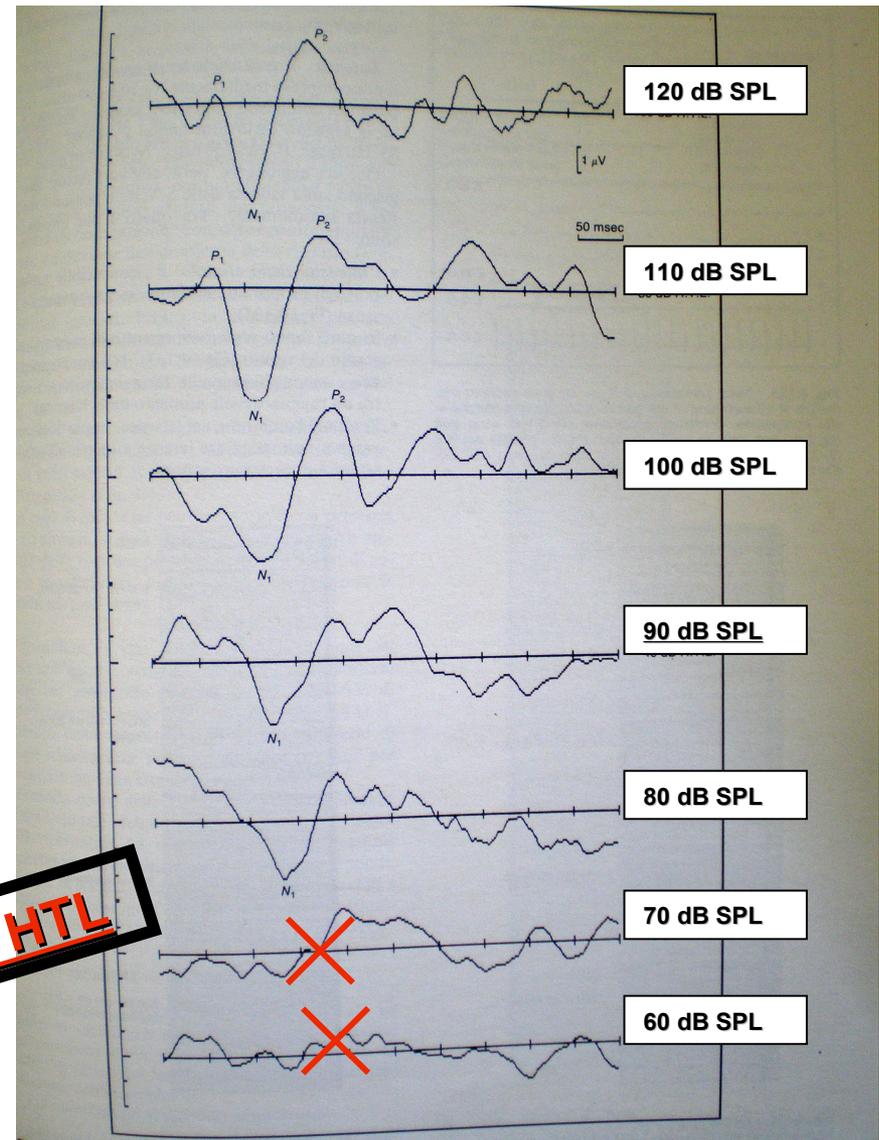
Tone burst in cuffia

Correzione: meno 15-30 da dB SPL  
(registrati) a dB HTL

(Masking)

**50-65 dB HTL**

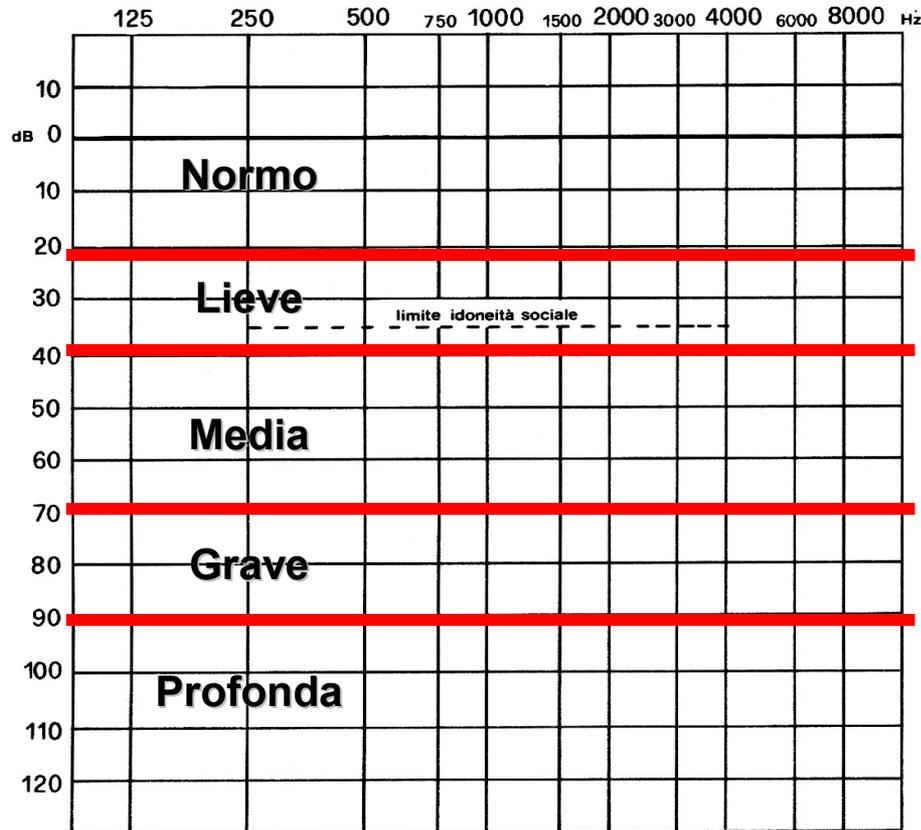
**Balzanelli – ORL BS**



# Ipoacusia..

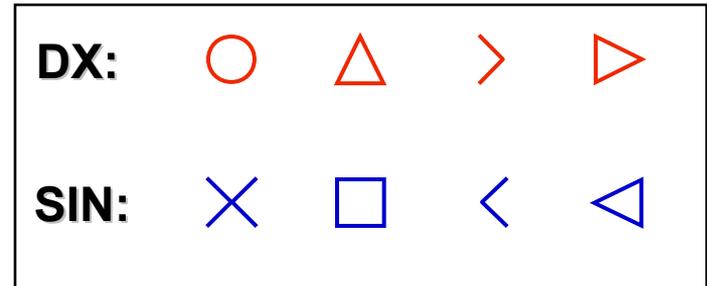
- Compromissione transitoria, stabile o evolutiva della funzione uditiva da causa trasmissiva, cocleare o retro-cocleare
- Diagnosi precoce, gestione della possibile eziologia, prevenzione di una possibile evoluzione, trattamento farmacologico, chirurgico, riabilitativo, protesico riducono la possibile insorgenza di disabilità e di handicap sociale
- Classificazione (entità, natura, età insorgenza, sede, cause)

# ENTITA' dell'ipoacusia



WHO (World Health Organization), 1980

BIAP (Bureau International d'Audiophonologie), 1996



"Disabling Hearing Loss":

>40 dB in adults;

>30 dB in children

(WHO, 2012)

# NATURA dell'Ipoacusia

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## TRASMISSIVA

- Malformazioni congenite
- Infezioni orecchio esterno/medio/tuba
- Colesteatoma
- Corpi estranei orecchio esterno
- Perforazione timpanica
- Esiti iatrogeni
- Timpanosclerosi
- Otosclerosi
- Discontinuità ossiculare (traumatica/degenerativa)



# Natura dell'Ipoacusia

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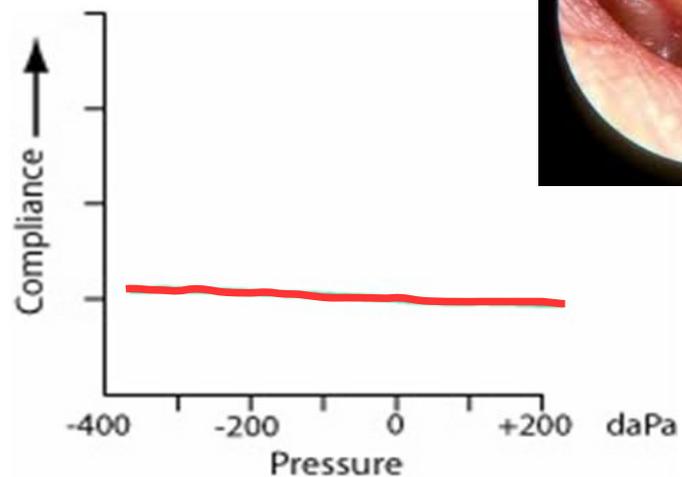
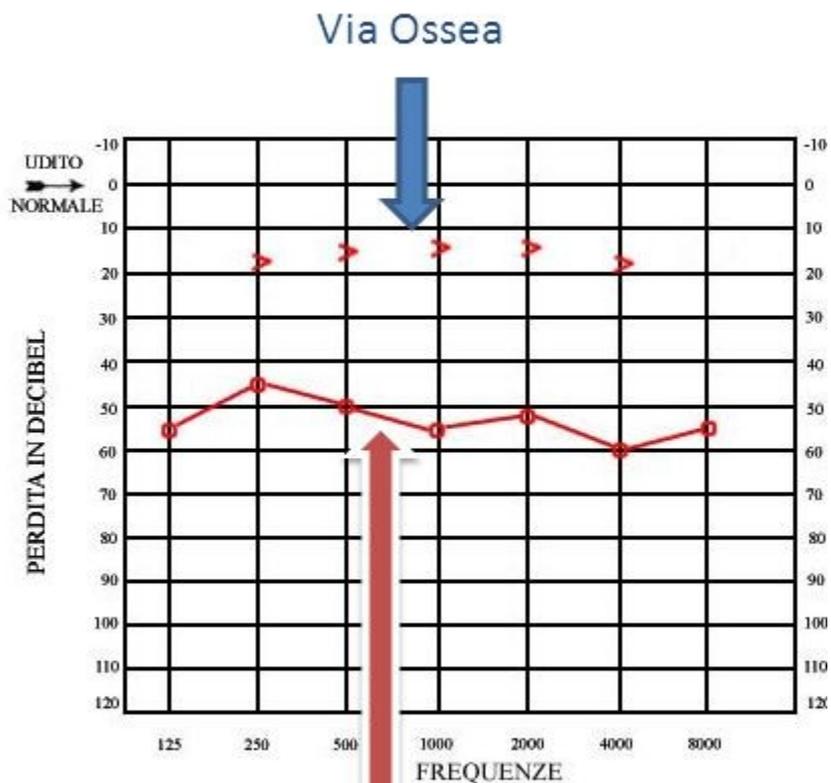
## NEUROSENSORIALE

- Presbiacusia
- Traumi (fisici o acustici)
- Ototossicità farmacologica
- Infezioni virali
- Malattia di Meniere
- Ipoacusia improvvisa idiopatica
- Patologie dell'angolo ponto-cerebellare
- Ischemie/emorragie cocleari
- Malattie degenerative/vascolari/espansive (cocleari o cerebrali)



# DIAGNOSI AUDIOLOGICA

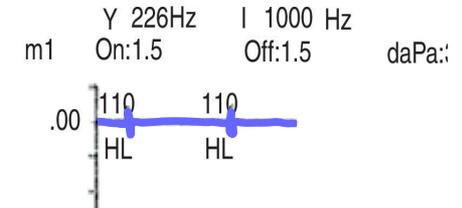
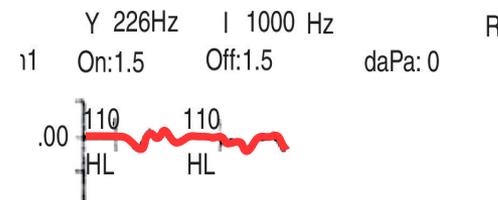
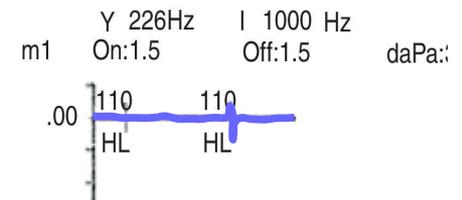
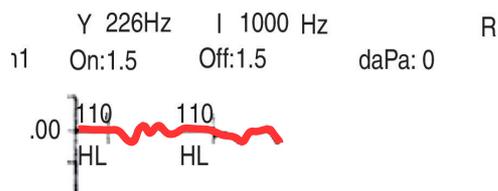
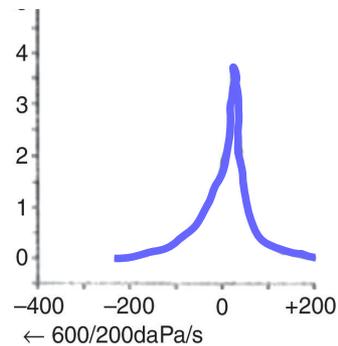
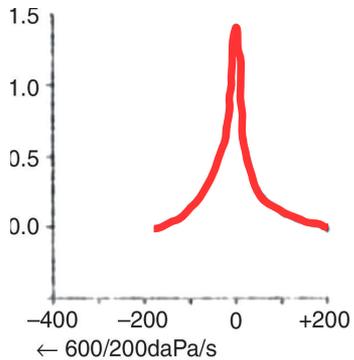
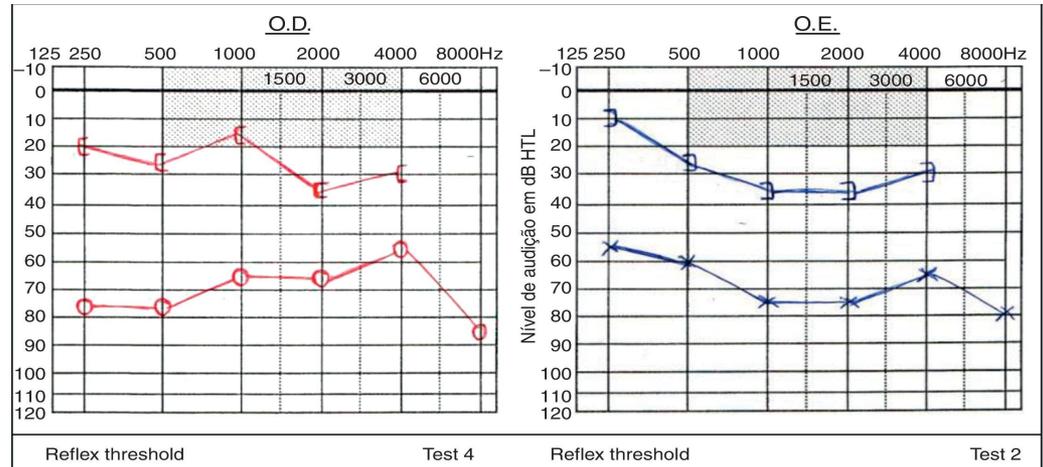
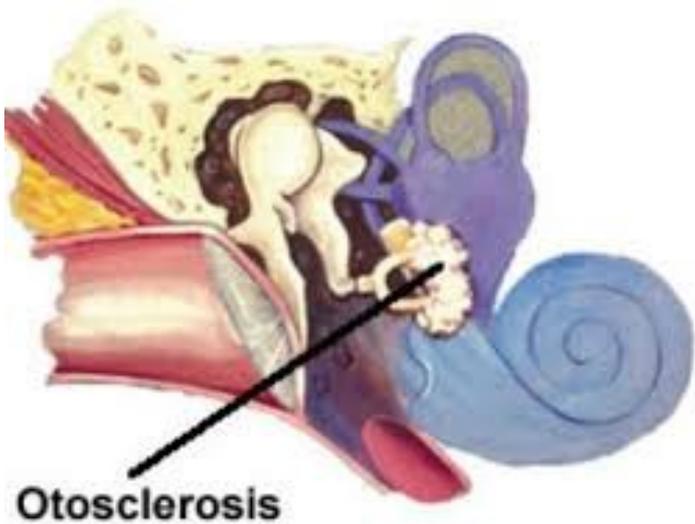
## Otite Media Acuta



RS assenti

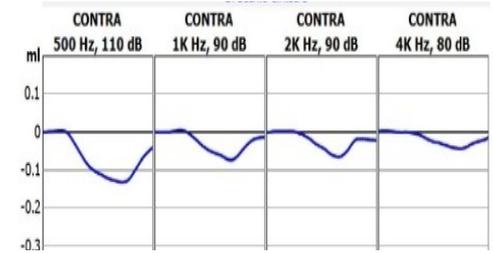
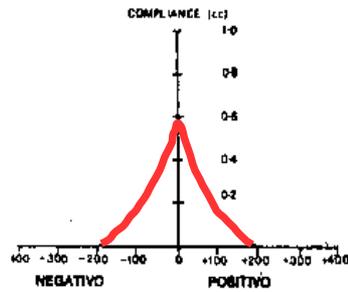
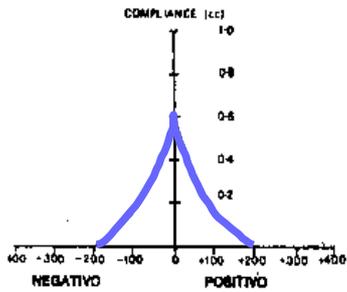
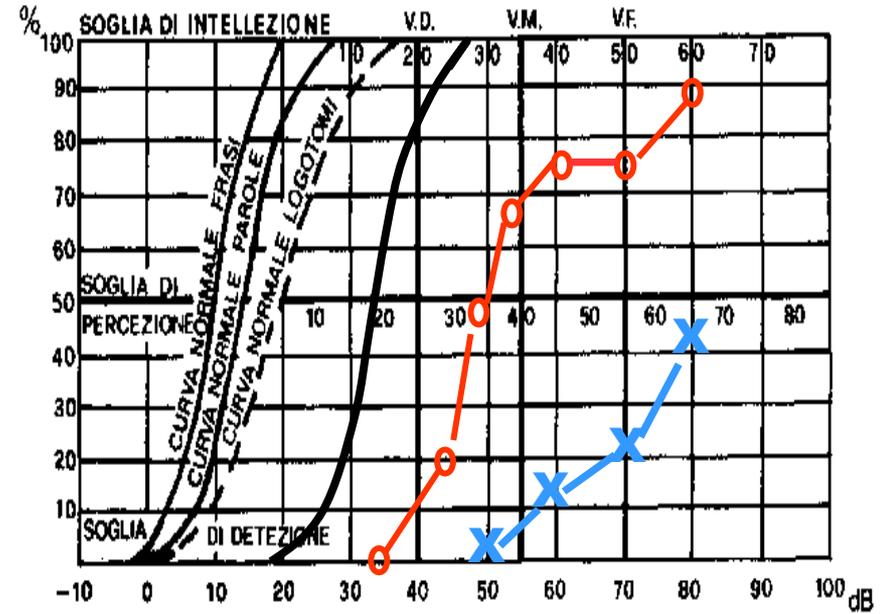
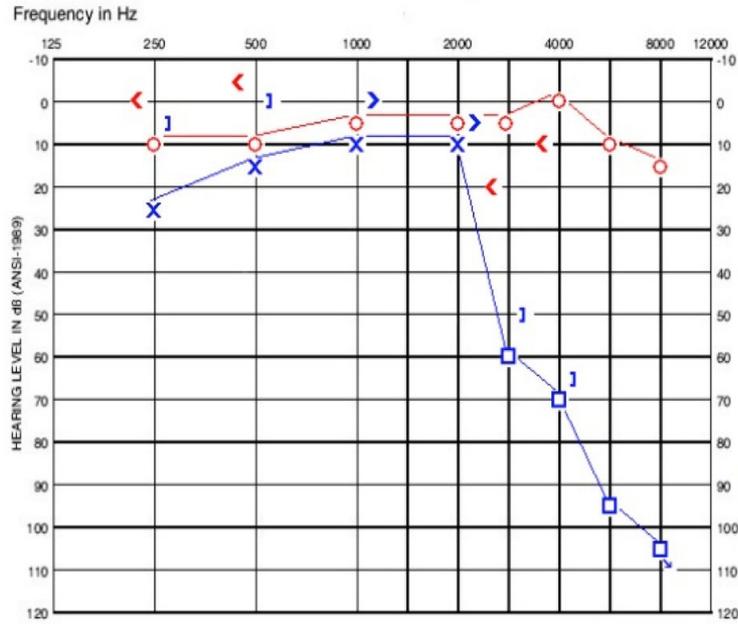
# DIAGNOSI AUDIOLOGICA

## Otosclerosi



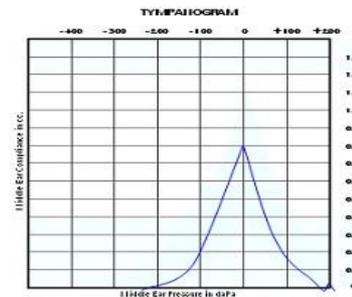
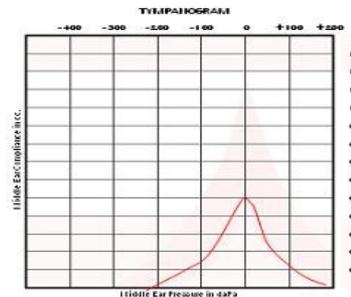
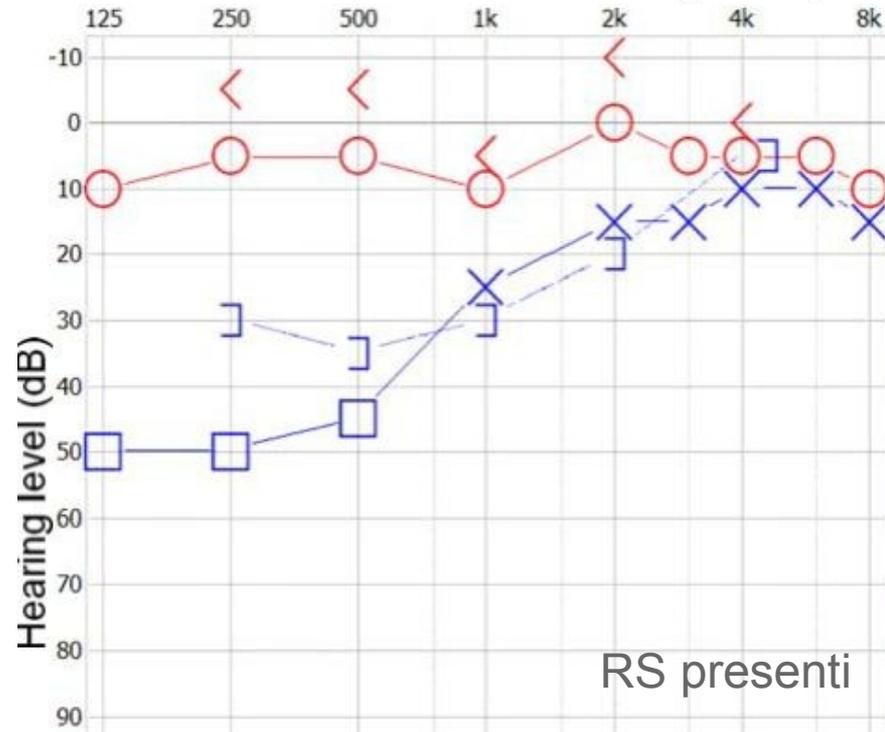
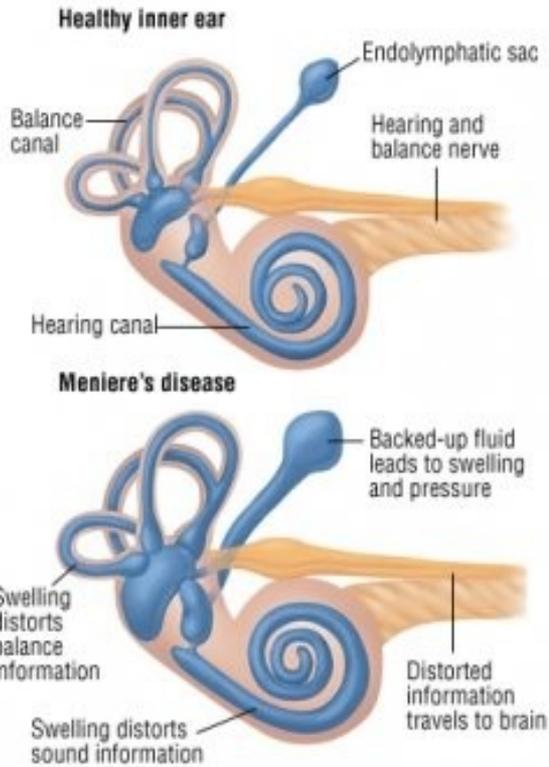
# DIAGNOSI AUDIOLOGICA

## Ipoacusia Improvvisa Idiopatica



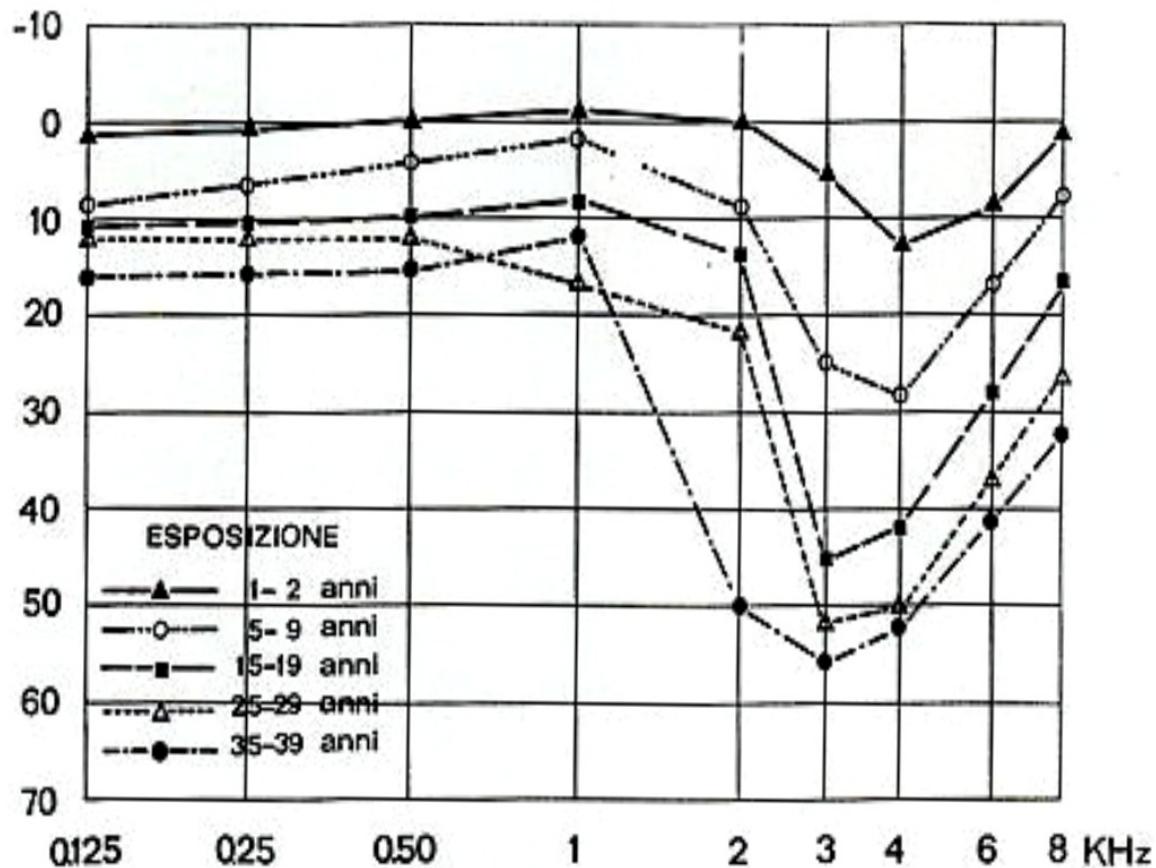
# DIAGNOSI AUDIOLOGICA

## Malattia di Meniere



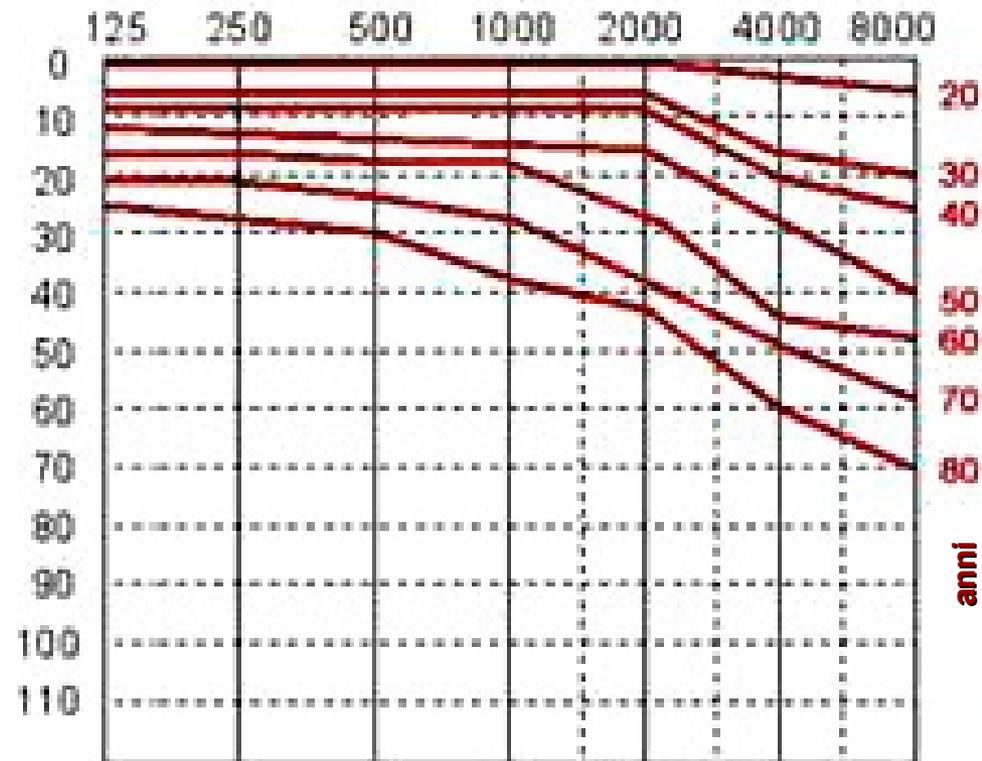
# DIAGNOSI AUDIOLOGICA

## Ipoacusia da Rumore



# DIAGNOSI AUDIOLOGICA

## Presbiacusia



# CONCLUSIONI

- Classificazione delle ipoacusie
- Inquadramento diagnostico e gestione delle varie forme di ipoacusia a seconda dell'entità, della causa e dell'età
- Approccio terapeutico (clinico, audio-protesico)
- Obiettivo: ripristino funzionale precoce e riduzione della disabilità uditiva, linguale e sociale



ORDINE  
MEDICI CHIRURGHI  
E ODONTOIATRI  
DELLA PROVINCIA  
DI BRESCIA



**Grazie per l'attenzione!**



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