

OCCUPATIONAL HEARING LOSS

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OCCUPATIONAL HEARING LOSS

- ❖ NOISE INDUCED HEARING LOSS
- ❖ NON-NOISE INDUCED HEARING LOSS

NON-NOISE INDUCED HEARING LOSS

- ❖ Barotrauma
- ❖ Decompression Sickness
- ❖ Air Embolism
- ❖ Chemical & Slag Burns
- ❖ Ototoxic Agents
- ❖ Blunt Head Trauma
- ❖ Vibration
- ❖ Heat

NOISE INDUCED HEARING LOSS

- ❖ Noise? *
- ❖ Epidemiology
- ❖ Mechanism of *NIHL*
- ❖ Risk factors of *NIHL*
 - Exposure intensity
 - Exposure duration
 - Individual susceptibility
 - Other factors
- ❖ Clinical findings
- ❖ Approach to patient
- ❖ Differential diagnosis
- ❖ Prevention

NON-AUDITORY EFFECTS OF NOISE

- ✖ Cardiovascular Effects (hypertention)
- ✖ Reproductive Effects
- ✖ Sleep Disturbance
- ✖ Psychologic Effects
- ✖ Effects On Hyperlipoproteinemia & Diabetes

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EPIDEMIOLOGY

- ❖ Noise exposure contributes to 22% of workplace related health issues
- ❖ Over 4 million DALYs (16% of the disabling hearing loss) globally are a result of occupational noise exposure
- ❖ Over a billion young people are at risk of NIHL due to listening to music (WHO, 2015)
- ❖ 24 percent of U.S. adults aged 20 to 69 years has features of NIHL
- ❖ 17% of US workers reported exposure to hazardous workplace noise

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RISK FACTORS OF NIHL

- ✗ Hyperlipoproteinemia?
- ✗ Diabetes (NIDDM)
- ✗ Exp. To Solvents
- ✗ Cigarette Smoking
- ✗ Eye color?
- ✗ Thyroid Abnormalities

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CLINICAL FINDING

- ✗ Difficulty in comprehending speech
- ✗ Need to be near or look at the person speaking
- ✗ Familiar sounds are muffled
- ✗ Complaints that people don't speak clearly
- ✗ Ringing noises in the ear

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APPROACH TO PATIENT WITH HEARING LOSS

- ✗ History

- ✗ Physical examination

 - Complete H & N Examination*

 - Tympanic Membrane Mobility*

 - Cranial Nerve Evaluation*

 - Cerebellar Function*

- ✗ Laboratory and radiologic studies

- ✗ Audiologic tests*

HEARING EVALUATION

- ✗ Test of spoken words

- ✗ Tuning fork tests

 - Rinne test

 - Weber test

 - Stenger test

- ✗ PURE TONE AUDIOMETRY

- ✗ BEKESY AUDIOMETRY

- ✗ SPEECH AUDIOMETRY

 - Speech Reception Threshold

 - Speech Discrimination Score

HEARING EVALUATION

- ✗ Impedence audiometry

 - tympanometry

 - acoustic reflex testing

- ✗ Evoked response audiometry

- ✗ Otoacoustic emissions

 - TEOAE

 - DPOAE

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DIFFERENTIAL DIAGNOSIS

- ✗ Presbycusis
- ✗ Hereditary hearing impairment
- ✗ Metabolic disorders
- ✗ Sudden *SNHL*
- ✗ Infections origin
- ✗ *CNS* diseases
- ✗ Mender's diseases
- ✗ Non-organic hearing loss

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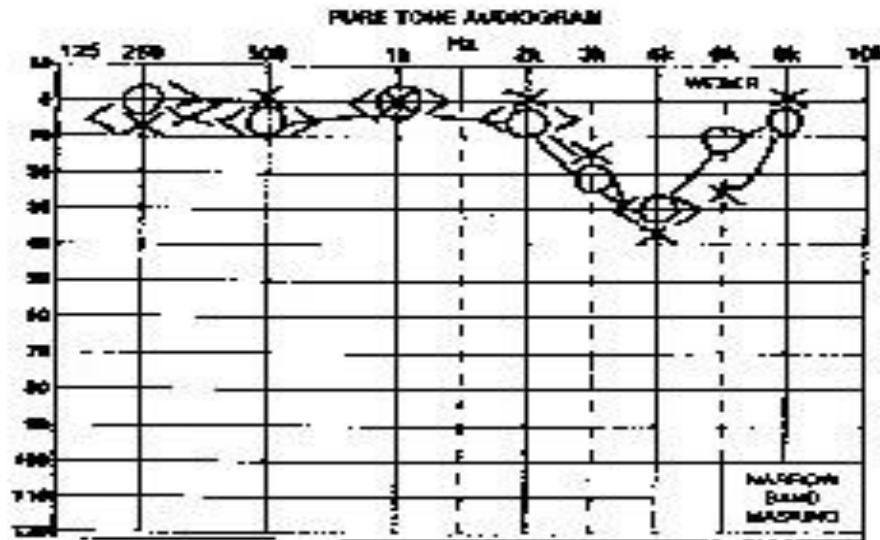
PREVENTION (HCP-HLPP)

- ✗ Initial and annual audits
- ✗ Exposure assessment
- ✗ Engineering & administrative controls
- ✗ Audiometric evaluation*
- ✗ Selection & use of *HPD*
- ✗ Workers education
- ✗ Record keeping
- ✗ Program evaluation

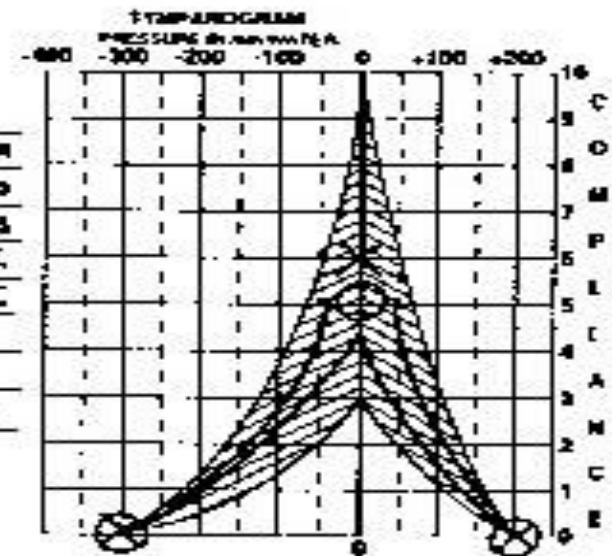
AUDIOGRAMS

- ✖ Baseline Audiogram
- ✖ Monitoring Audiogram
- ✖ Retest Audiogram
- ✖ Confirmation Audiogram
- ✖ Exit Audiogram

NOISE INDUCED HEARING LOSS



KEY	L	R
AC UNMASKED	X	O
AC MASKED	□	△
BC UNMASKED	>	<
BC MASKED	]	[
AC SOUND FIELD	S	
AC AIDED	A	
NOT HEARD	+	



SPEECH RECEPTION THRESHOLD

R	0	
L	0	
Aided		

	MCL	UCL
R		
L		

TONE DECAY

R		
L		

SPEECH DISCRIMINATION

R	94	40
L	92	40
Aided		

N SL Unaided

STATIC COMPLIANCE

RE	LT
75	75
50	50
25	25
0	0

RIGHT	LEFT
C ₂	C ₂
C ₁	C ₁
C ₀	C ₀

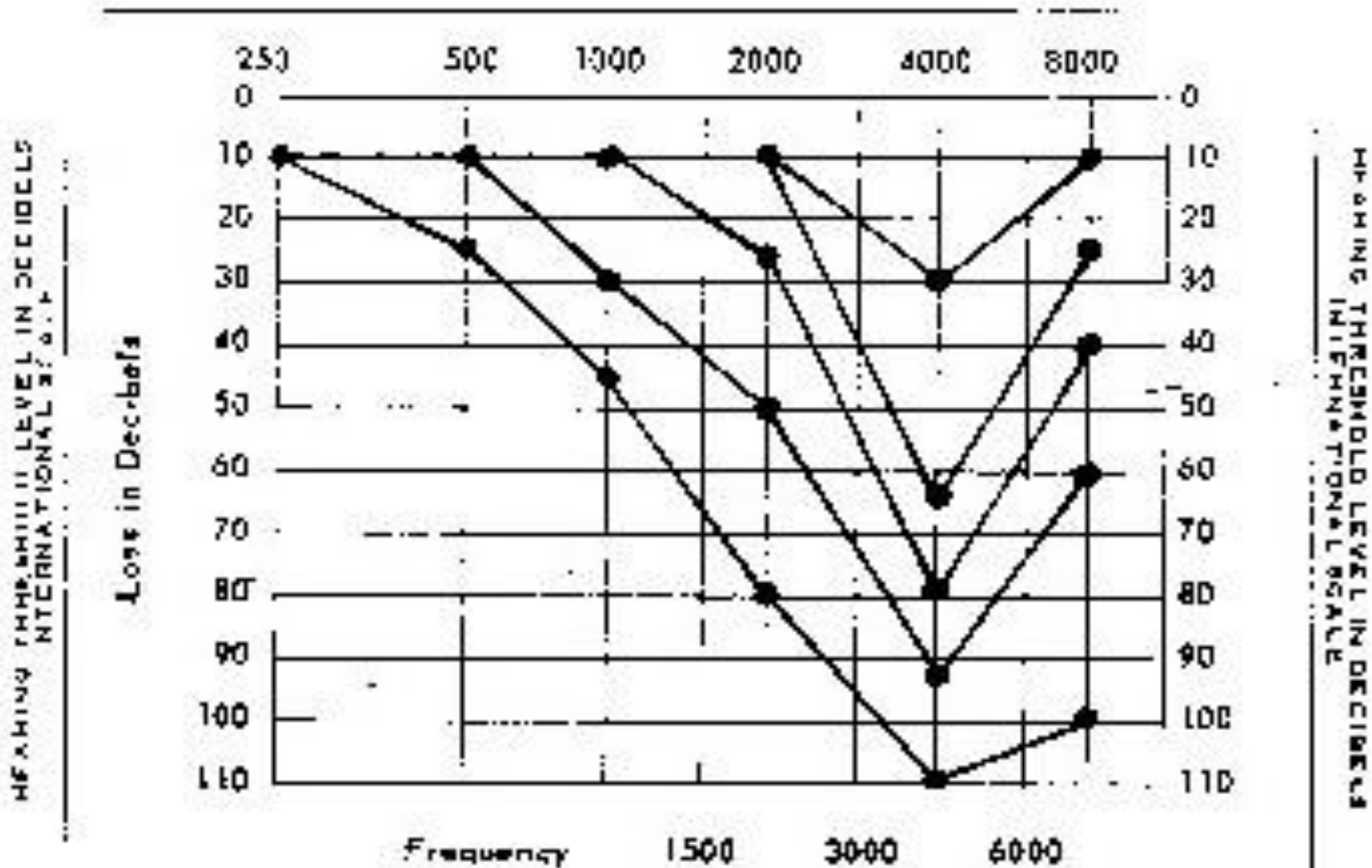
CONTRALATERAL STAPEDIAL REFLEX		
300	1K	2K
R 70	70	65
L 70	65	70

REFLEX DECAY

300	1K	2K
R		
L		

BILATERAL STAPEDIAL REFLEX		
100	200	300
R	100	100
L	100	100

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HEARING PROTECTION DEVICES

✖ Personal hearing protectors

+ Canal caps



+ Ear plugs



+ Ear muffs



NOISE CANCELLATION TECHNOLOGY

Active noise control utilizes sound waves of equal amplitude and frequency but opposite phase to cancel out unwanted sound.

❖ Tactical Communication and Protective System (TCAPS)



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EDUCATION&MOTIVATION

- ✗ Requirements of and rationale
- ✗ Company policy for the elimination of noise
- ✗ Hazardous noise sources at the worksite
- ✗ Training in the use of hearing protectors
- ✗ Audiometry
- ✗ Individual responsibilities

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RECORD KEEPING

- ✖ Noise Exposure Records
- ✖ Audiometric Records
- ✖ Hearing Protection Records
- ✖ Education Records
- ✖ Other Records

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SIGNIFICANT TRESHOLD SHIFT

- OSHA STS
- OSHA STS Twice
- AAO-HNS Shift
- 1972 HIOSH Shift
- 15-dB Shift
- 15-dB Twice
- 15-dB Twice 1-4 kHz
- 10-dB Avg. 3-4 kHz



QUESTIONS?