THE WORLD OF HEARING & NOISE

HEARING CONSERVATION IS A SOUND INVESTMENT

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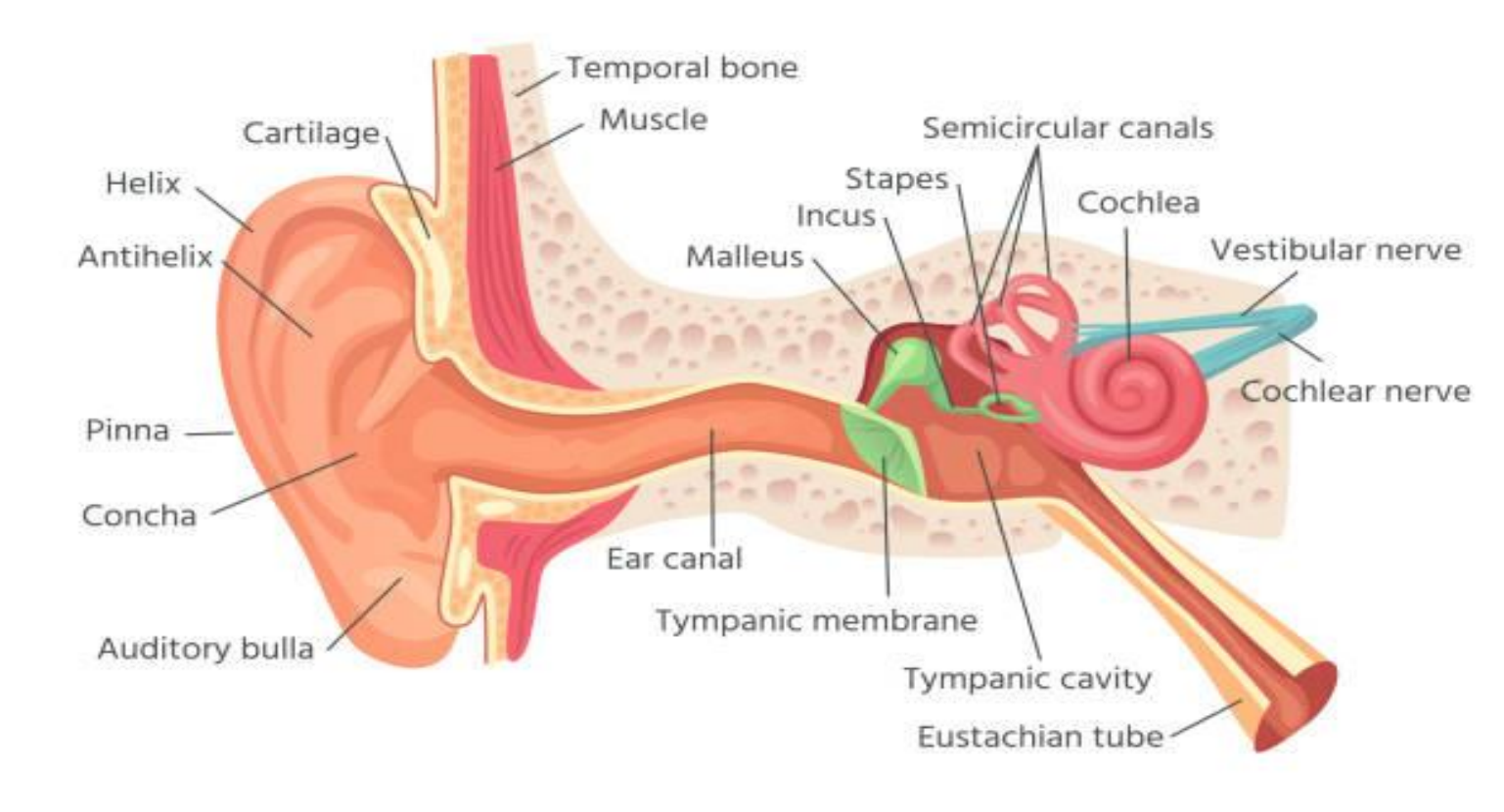
THE EAR AND HOW IT WORKS



If It Sounds Too Loud, It *Is* Too Loud

Decibels are the unit of measurement for sound, abbreviated dB. Sounds at or below 70 dB are considered safe for our hearing. That's the sound of a normal conversation between two people. Sounds above 70 dB will damage hearing over time.

Like the Richter scale for measuring earthquakes, the decibel scale is logarithmic. This means that loudness is not directly proportional to sound intensity. Instead, the intensity of a sound grows very fast. A sound at 20 dB is 10 times more intense than a sound at 10 dB, and would be perceived as twice as loud.

If we need to shout at a friend who is an arm's length away, or we can hear music coming out of another person's headphones, the volume is at least 85 dB

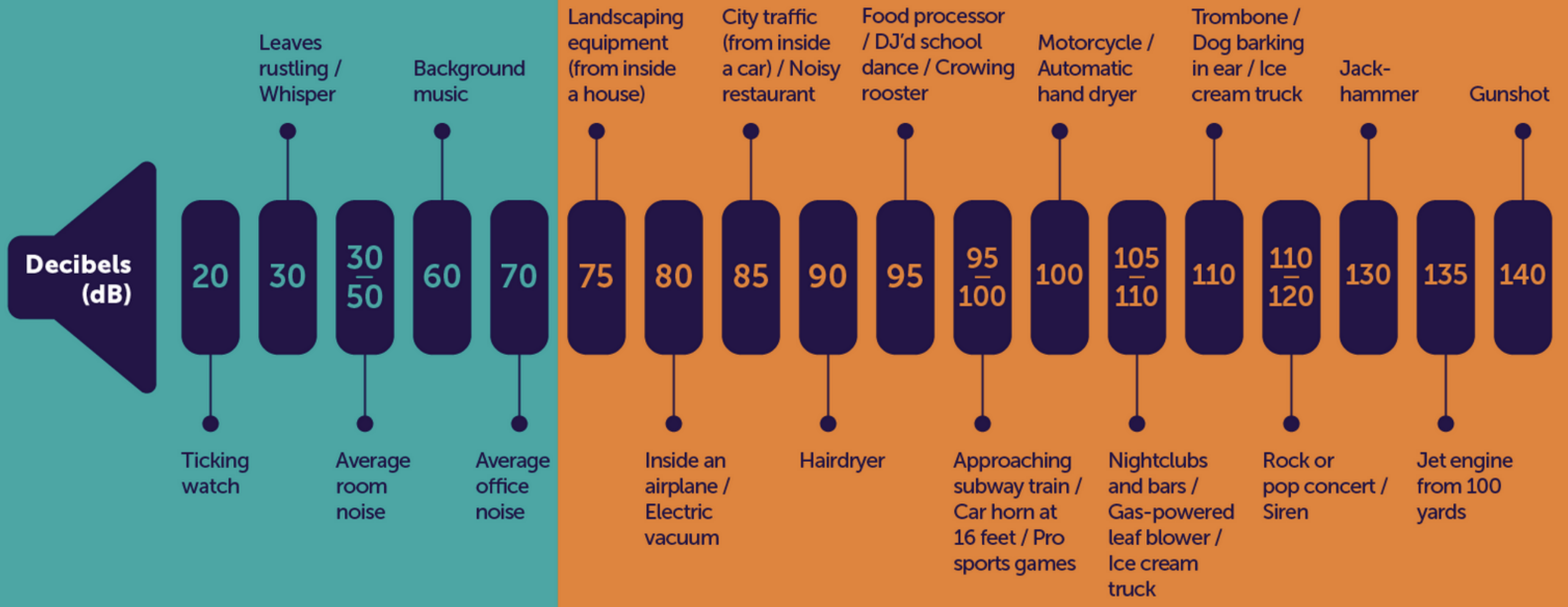
Headphones and earbuds can reach as loud as 100 dB or more, so a safe level is 50 to 60 percent of the maximum volume.

If you're speaking with someone at conversational distance or we can hear a person's music player its too loud

NOISE LEVELS

Sounds at or below 70 dB are safe.

Sounds above 70 dB are harmful.



10 Signs of Hearing Loss

If you have any of these signs or symptoms, you may have hearing loss caused by noise:

- Speech and other sounds seem muffled- Dull (TTS)
- Trouble hearing high-pitched sounds (e.g., birds, doorbell, telephone, alarm clock)
- Trouble understanding conversations when you are in a noisy place, such as a restaurant
- Trouble understanding speech over the phone
- Trouble hearing speech consonants (e.g., trouble hearing the difference between s and f, between p and t, or between sh and th in speech)
- Asking others to speak more slowly and clearly
- Asking someone to speak more loudly or repeat what they said
- Turning up the volume of the television or radio
- Ringing in the ears(TTS)
- Hypersensitivity to certain sounds (certain sounds are very bothersome or create pain)

Name _____ Age _____ Sex _____

Address _____

Referred By _____ Problem _____

Test Location _____ Audiometer _____ Case No. _____

Test Reliability _____ Examiner _____ Date _____

SYMBOLS:

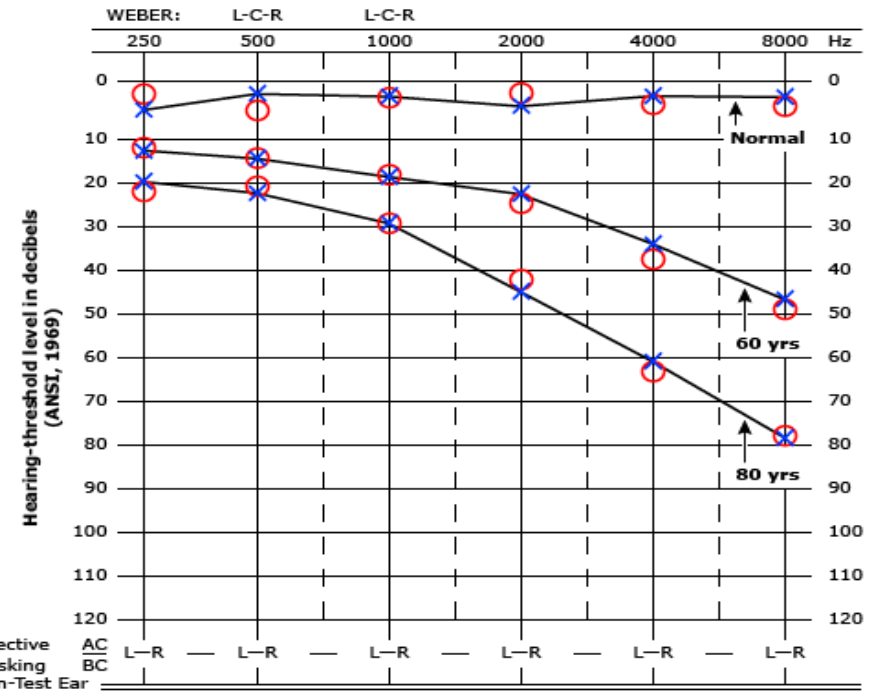
Air Conduction:

- (Blue) left ear thresholds
- (Red) right ear thresholds
- No response to maximum output of the audiometer
- (Blue) left ear masked thresholds
- (Red) right ear masked thresholds

Bone Conduction:

- (Blue) left ear thresholds
- (Red) right ear thresholds
- No response to maximum output of the audiometer
- (Blue) left ear masked thresholds
- (Red) right ear masked thresholds
- S Sound field

PURE-TONE AUDIOMETRY



PURE TONE AVERAGES		
EAR	.5-1	.5.1.2
LEFT		
RIGHT		

TONE DECAY FREQUENCY

EAR			MASK
Left			
Right			
Method:			

Reflex Decay: R:____ L:____

Tympanogram R L

ART CR CL

NML___ ___ .5K

FLAT___ ___ 1K

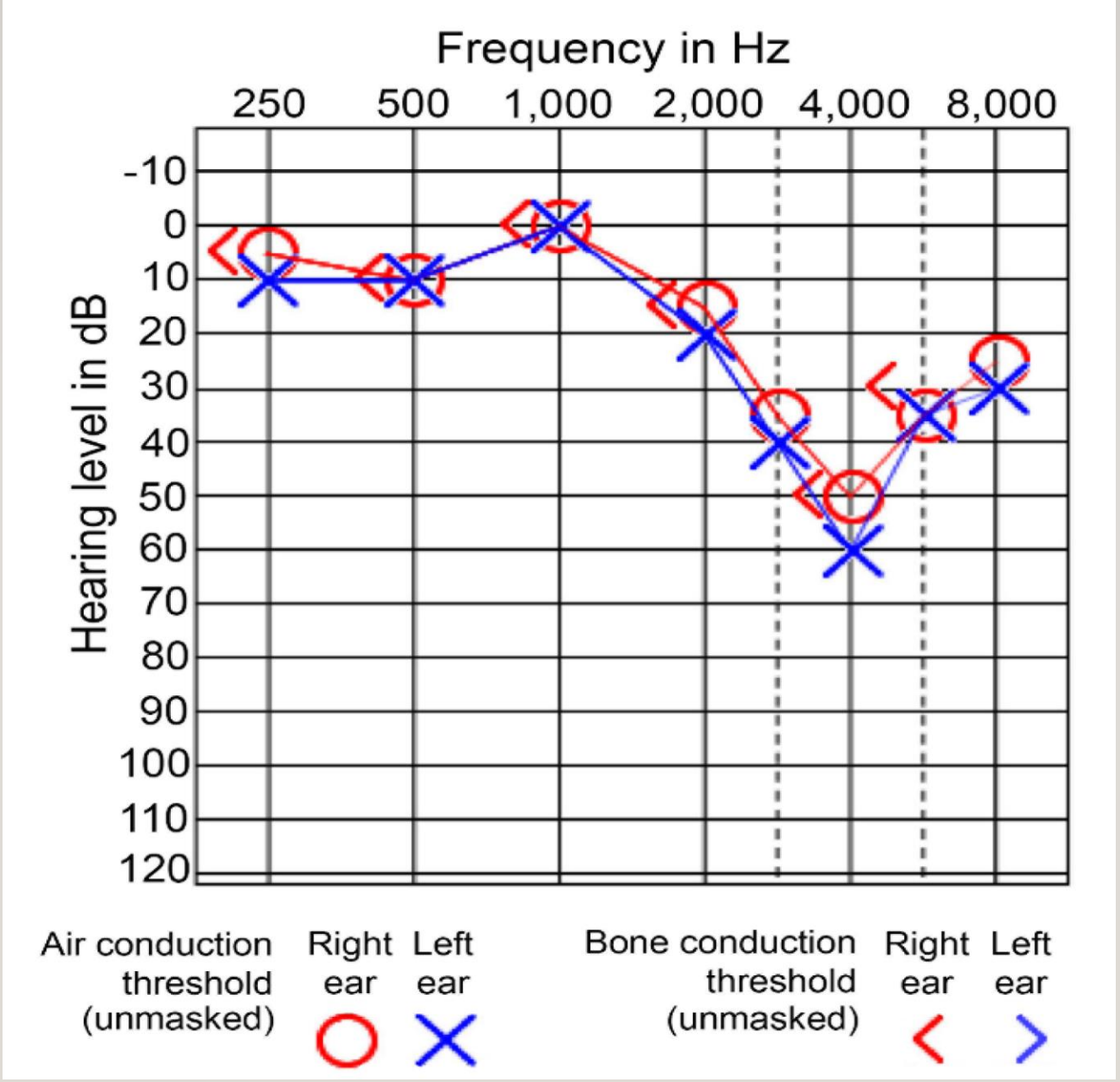
NEG___ ___ 2K

VOL___ ___ 4K

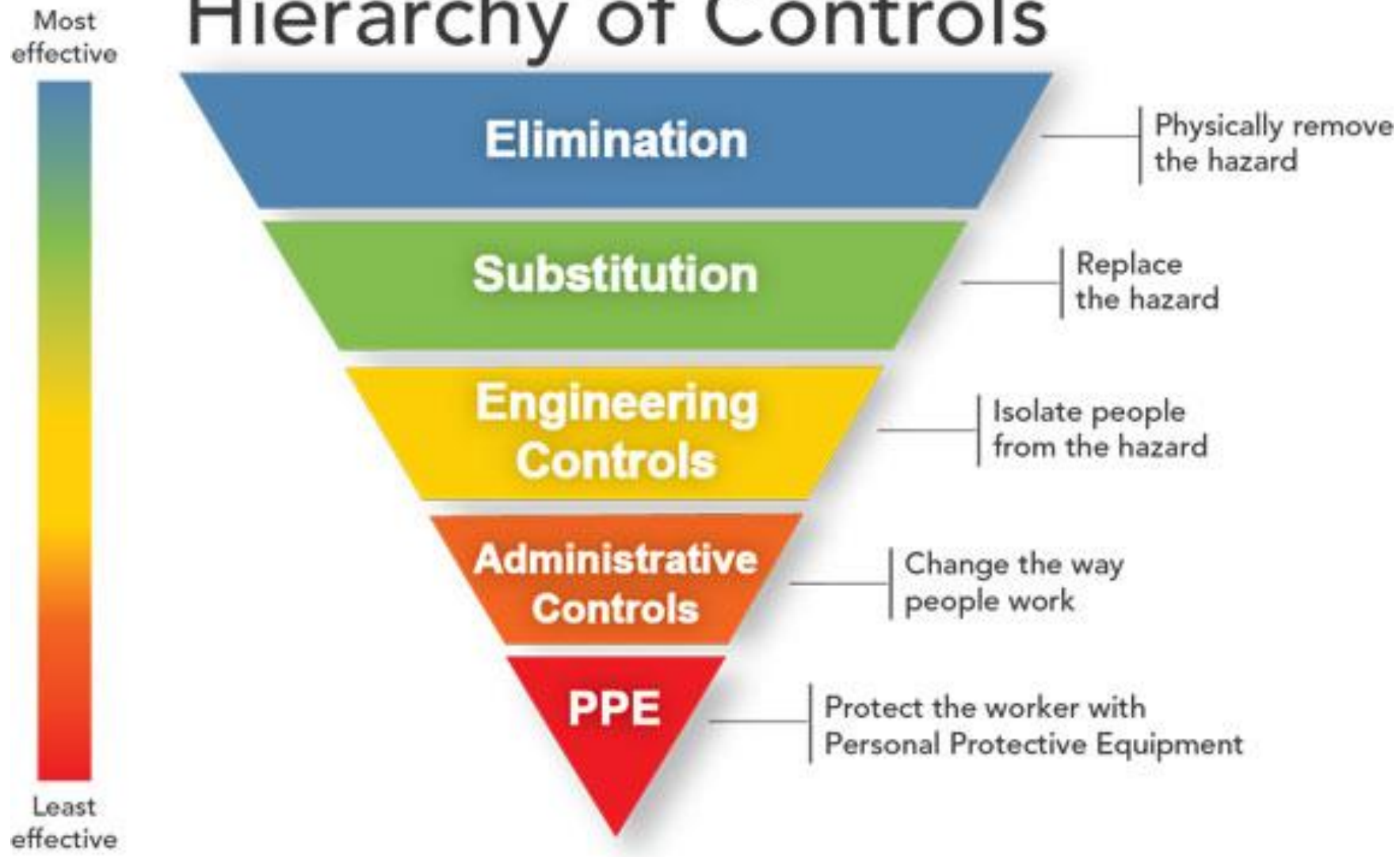
SPEECH AUDIOMETRY

	Right Intesity		Left Intesity		Masking	
SRT	dB		dB		L	R
DISCM	%	dB	%	dB	L	R
	%	dB	%	dB	L	R
	%	dB	%	dB	L	R
MCL	dB		MCL	dB		
LCL	dB		LCL	dB		

SPEECH SOUND FIELD AWARENESS _____dB


Frequency in Hz
250
500
1,000
2,000
4,000
8,000
Hearing level in dB
-10
0
10
20
30
40
50
60
70
80
90
100
110
120
Air conduction threshold (unmasked)
Right ear
Left ear
Bone conduction threshold (unmasked)
Right ear
Left ear

Hierarchy of Controls



INSTRUMENTS USED TO MEASURE NOISE

Measure Decibels Using Your Phone

Both Apple and Android phones support sound level meter apps that measure decibels. In fact, on the Apple iPhone and Apple Watch, the embedded Health app measures decibels and can send alerts when it is too loud. Here are other sound level meter apps:

- NIOSH Sound Level Meter App (iOS)
- NoiSee (iOS)
- SLPnFFT Noise Meter (iOS)
- Sound Meter X (iOS)
- Sound Meter (Android)
- SoundPrint (iOS and Android)

HEARING PROTECTION DEVICES

TYPES OF HEARING DEVICES

- Ear plugs
- Banded Earplugs
- Earmuffs
- Active
- Passive
- Noise Cancelling
- Communicative

EARPLUGS

- Premolded
- Reusable
- Disposable

EARPLUGS CONT.

- Hybrid
- Custom
- Banded

SPECIAL PROTECTORS

- Level dependent
  - Active
  - Passive
- Noise Cancelling
- Communication

NOISE REDUCTION RATING (NRR)

- Purpose- EPA developed for Consumers
- The right amount of attenuation
- Personal attenuation rating (PAR)- Fit test
- NIOSH QuickFit Web

DERATING OF HEARING PROTECTION

OSHA

Estimated exposure

(NRR-7)/2

NRR=29 dB

What is the estimated protection?

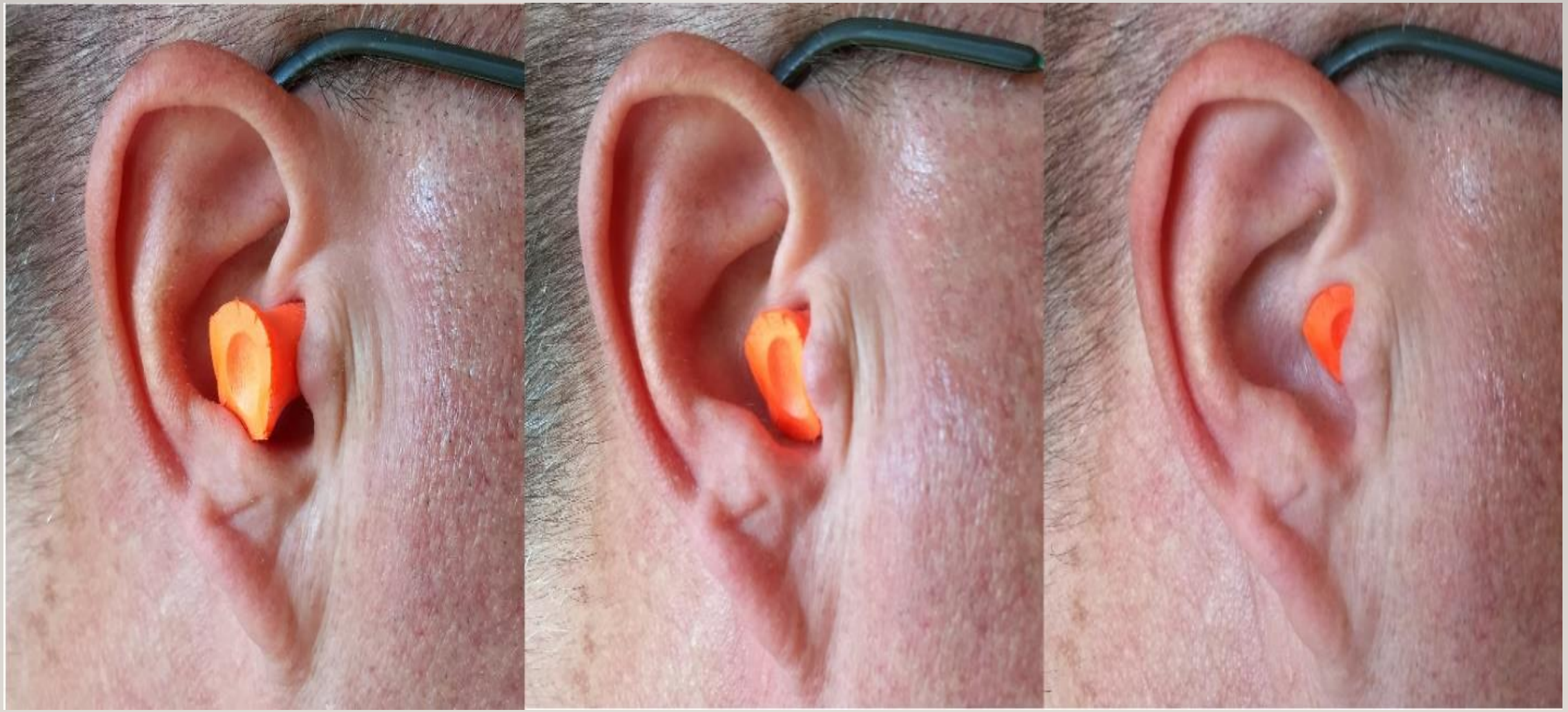
NIOSH

NIOSH recommends derating the NRR by subtracting:

Earmuffs- 25%

Formable- 50%

All other earplugs- 70%



TIPS FOR CHOOSING THE RIGHT HEARING PROTECTION

1) Know How Much Noise Reduction You Need- A large percentage of industrial noise is 95dBA. Need to reduce at least 10dB. - Measure the Noise Level- SLM. If noise is 100dB or higher use double protection
2) Consider Your Worksite and or Tasks- Are you wearing other PPE i.e. Safety Glasses, Hard hat.
3) Once you've decided 1&2 the best protection is the one that is most comfortable and consistently worn