HEARING CONSERVATION FOR MUSICIANS

Hearing Loss and Musicians

- Hearing well is correctly associated with effective communication skills and quality of life.
- For musicians, hearing well is essential for their art. A musician suffering from minor hearing loss will effect perceptions of tone and pitch required for an ideal performance. In extreme cases, severe hearing loss could mean the end of a career.

Hearing Loss and Musicians

- Our ears do not distinguish between the sounds we enjoy and those that annoy. Throughout the day, high noise levels will cause our ears to fatigue. The source of these loud noises can come from a musical instrument, a headset, a blender or even a jackhammer, which all can have an accumulative effect.
- Eventually, ears that are constantly exposed to loud noises will lose the ability to recover, resulting in hearing loss.

Hearing Loss and Musicians

Unfortunately, the process of losing our hearing is usually:

Painless

Progressive

Permanent

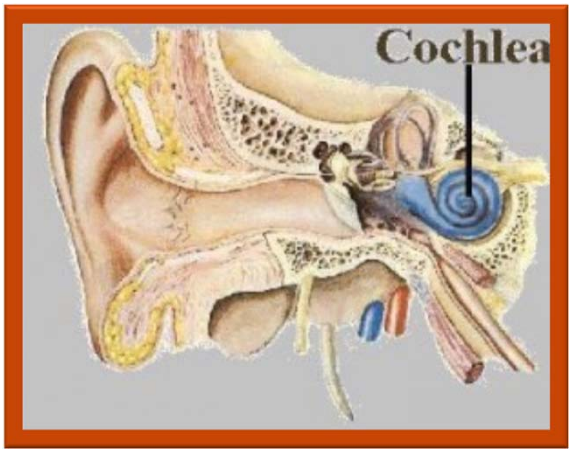
Fortunately, *and most importantly*, the process is also:

PREVENTABLE!

Hearing Loss and Musicians

- Different types of hearing loss depend on the part of the ear that suffers damage. We will focus on sensorineural hearing loss.
- Usually sensorineural hearing loss occurs when the nerve endings – *or hair-like structures called cilia* in our inner ear - fail. This failure is often from damage caused by prolonged exposure to loud noises.

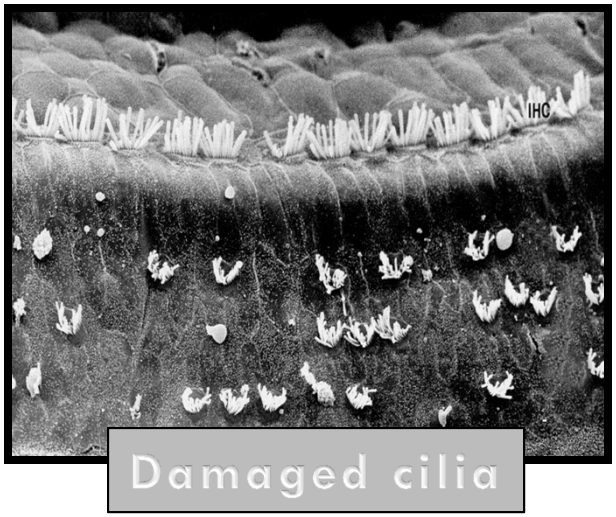
Hearing Loss and Musicians



- Cilia are located in the cochlea, a liquid-filled area in the center ear that looks like a snail shell.
- As sounds enters the ear, cilia reacts to the pressure changes by processing the mechanical vibrations into neurological signals. The neurological signals are sent to the brain via the auditory nerve, where it translates the signals into the sounds we hear.

Hearing Loss and Musicians

- Listening to loud noises causes the cilia to become tired and worn. If they are constantly exposed to loud noises, the cilia will eventually fail to recover, resulting in a loss of hearing.



(Scanning Electron Micrograph H.Engstrom/ B.Engstrom - courtesy of Widex

Hearing Loss and Musicians

- **An analogy:**

  Suppose you work all summer creating a beautiful lawn. In the fall when school starts, students find a path through your yard. As time goes by, the grass along this path starts to get beat down. Eventually, the grass along this path does not come back; but instead dies, leaving behind a dirt trail.

  The same thing happens to the ear – eventually, recovery of the hair-like cilia is not possible. The mechanisms required to produce sound are permanently damaged or even disappear completely.

Hearing Loss and Musicians

- A misconception is that sound is just "turned down" when we suffer from hearing loss. Instead, hearing loss first affects the high frequency range. It will become increasingly difficult to hear high-pitched voices such as those of children or birds.
- High-frequency hearing loss also causes many words to sound alike, especially those containing sounds such as S or soft C, F, SH, CH or H. Words like "hill," "fill" and "sill" may sound exactly the same.
- Musical instruments such as the flute or the piccolo will be become difficult to distinguish.

Hearing Loss and Musicians

- Another misconception is hearing loss is simply a physical nuisance. But, as it becomes more and more difficult to communicate, we are also become susceptible to:
  - A high degree of anxiety,
  - Social isolation,
  - Depression,
  - Even paranoia.

Hearing Loss and Musicians

Musicians are particularly prone to hearing loss. The list of musicians who have lost their hearing is long and distinguished. The reasons musicians are particularly susceptible is because:

- Exposure to high noise levels is frequent and over a long duration of time.
- Time between exposures is short, thus, ears only have a limited time for recovery.

Tinnitus

Musicians are also particularly prone to a medical condition called tinnitus.

Tinnitus is the perception of sound in one or both ears when no external sound is present. It is often referred to as "**ringing in the ears**," although some people hear hissing, roaring, whistling, chirping or clicking. Tinnitus can be intermittent or constant-with single or multiple tones-and its perceived volume can range from subtle to shattering. - from The American Tinnitus Association

BOB SEGER references to tinnitus in the song *Turn the Page* - "*Later in the evening as you lie awake in bed, with the echo from the amplifiers ringing in your head.*"

Quote and Quotables

- **PETE TOWNSHEND – THE WHO**

  "I have severe hearing damage. It's manifested itself as tinnitus, ringing in the ears at frequencies that I play guitar. It hurts, it's painful, and it's frustrating."

- **MICK FLEETWOOD - FLEETWOOD MAC**

  "The world's worst is when you find yourself going like Mother Hubbard and cupping your hand behind your ear. I was a major glutton for volume: 'Gotta Feel It, Gotta Hear It.' Sooner or later you're going to pay the reaper."

- **ULRICH – METALLICA**

  "If you get a scratch on your nose, in a week that'll be gone. "When you scratch your hearing or damage your hearing, it doesn't come back. I try to point out to younger kids ... once your hearing is gone, it's gone, and there's no real remedy.“

Common Noise Exposure Levels

- Noise intensity and the length of time you are exposed determines how susceptible you are to hearing loss.
- Sound pressure is measured in decibels (dB). The level of noise that is considered to be destructive to the ear is 85 dBA or greater.
- The more an ear is exposed to noises at or above this level, the more opportunity there is for damage to occur.

Common Noise Exposure Levels

- Rustling Leaves 20 dBA
- Whisper 34 dBA
- Quiet Office 40 dBA
- Conversation 60 dBA
- Busy Traffic 75 dBA
- 2-1/2 Ton Truck 94 dBA
- Pneumatic Drill 100 dBA
- Auto Horn 120 dBP

Common Noise Exposure Levels

Sound level ranges of a few un-amplified musical instruments.

- Bass Drum 35 - 115 dB
- Cymbal 40 - 110 dB
- Organ 35 - 110 dB
- Piano 60 - 100 dB
- Trumpet 55 – 95 dB
- Violin 42 – 95 dB

Hearing Conservation for Musicians

As a musician, there are a number of preventive measures you can take to protect your hearing:

- Rest your ears between practice and performance sessions by reducing the amount and the level of noise you are exposed.
- Have regular check-ups with an audiologist.
- Wear earplugs to reduce overall noise level exposure. There are earplugs specifically designed for musicians.

Musician Earplugs

Musicians earplugs are designed to replicate the natural response of sound. As a result, the sounds that you hear are the same quality as the original - *only quieter*.

The result is the ability to hear speech and music clearly, as the ear reads the full blended frequencies. You can feel the bass, and distinguish each tone. But because direct pressure to the ears are reduced, the level of damage is reduced.

Musician Earplugs

- Though 'over-the-counter' musician earplugs are available, the best protection are plugs that have a custom fit to the ear.
- Custom earplugs are tailor-made by an audiologist.
- If taken care of, these earplugs can provide protection for many, many years.
- If you are interested in custom plugs, find a local audiologist who will provide this service for you.

Musician Earplugs

- **The ER-9 Filter** – a custom ear plug that attenuates by 9 dB
- **The ER-15 Filter** – a custom ear plug that attenuates by 15 dB
- **The ER-20 Filter** – a non-custom ear plug that attenuates by 20 dB, (one-size-fits-most)
- **The ER-25 Filter** – a custom ear plug that attenuates by 25 dB

*The number corresponds with the amount of sound reduction provided in dB.

Hearing Conservation for Musicians

- In the end, it is up to you to protect your hearing. Even if you do not pursue a living as a professional musician, you do not want to miss out on all the sounds that life has to offer - music, the sound of voices from those we care for, a child's first words.
- Protect this invaluable connection we have to the world, and it should serve you well.

Ludwig Van Beethoven

Regarding His Own Hearing Loss

"Forgive me when you see me draw back when I would have gladly mingled with you. My misfortune is doubly painful to me because I am bound to be misunderstood; for me there can be no relaxation with my fellow men, no refined conversations, no mutual exchange of ideas. I must live almost alone, like one who has been banished; I can mix with society only as much as true necessity demands. If I approach near to people a hot terror seizes upon me, and I fear being exposed to the danger that my condition might be noticed."