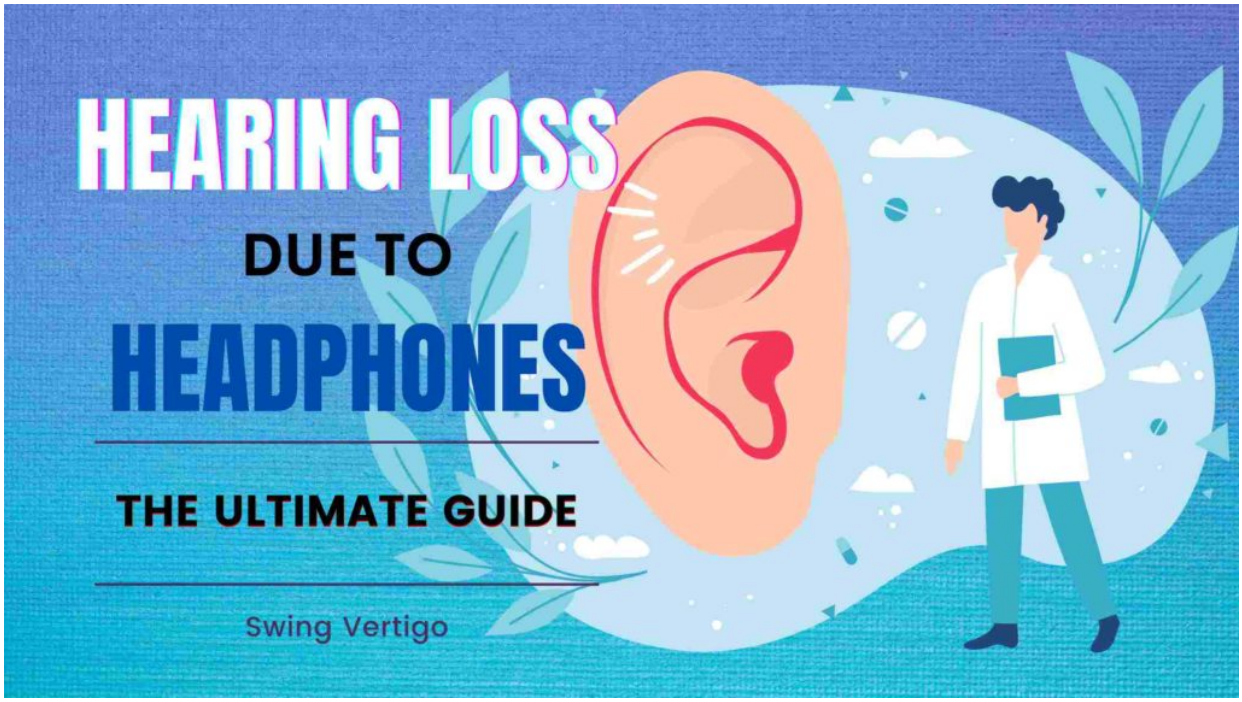
Hearing Loss from Headphones: The Ultimate Guide (2021)



1.1 Billion teenagers and young adults are at a risk of hearing loss. The reason?

Unsafe use of personal audio devices which includes headphones and smartphones. In fact, the numbers are growing every day especially among the next-gen.

We tend to enjoy music from headphones in privacy, often at high volumes for genres like DJ or jazz which is making the problem worse.

But, don't worry!

This extensive guide will be your one-stop solution to hearing loss from headphones. From cause to preventive measures, our guide has it all.

So, let's dive right in:

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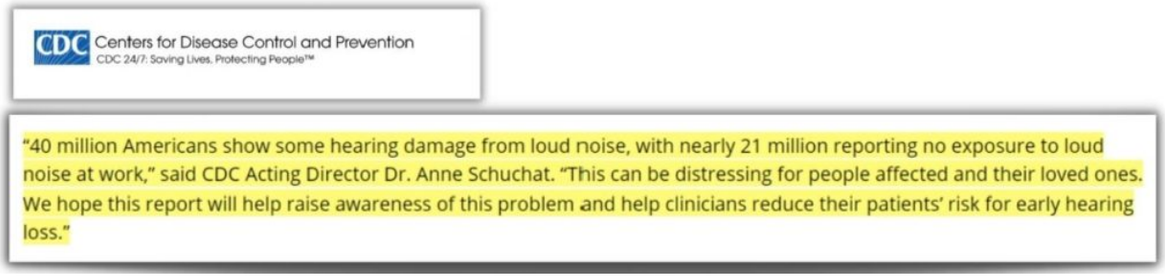
Chapter 1: Truth About Noise-Induced Hearing Loss

According to a recent study by CDC, 40 million Americans show hearing damage from loud noise.



CDC on Hearing Loss

But there is much more into this study than what meets the eye.

This along with several other studies are indicating something far more serious for hearing health in today's world.

And in this chapter, we will provide all the details about the subject in focus: Noise-Induced Hearing Loss (NIHL). This is important for everyone; from musicians to people working amidst industrial noise.

Let's get started:

Noise-Induced Hearing Loss: What You Need To Know?

To be specific and simple, Noise-Induced Hearing Loss is permanent damage to stereocilia, the tiny hair cells in your ears, from the exposure to loud sounds. These hair cells are sensitive, not replaceable, and do not regrow.

So once they are damaged, they cannot transmit electrical signals in the brain resulting in a hearing impedance.

People who suffer from NIHC may be detached from normal living. They can be greatly handicapped and get depressed and lonely as they are unable to participate in social activities.

There are 2 ways in which NIHL can affect hearing:

Exposure to loud background noise or music for extended periods of time which can **gradually deteriorate your hearing**.

Or a sudden exposure to a short high intensity noise (such as a gunshot or jackhammer) which **damage your hearing in one-go.**

(More on this in Chapter 2)

In both of these ways, loud noise overstimulates delicate hearing cells leading to its permanent injury or death. Once died, these hearing cells cannot be restored in humans making the problem chronic and severe.

Who are affected by Noise-Induced Hearing Loss?

Now, the bitter truth is:

There is lack of awareness, open debates, presentations and public awareness about NIHL. Hearing Loss patients are left to live on their fate and they suffer from social isolation as we mentioned before.

And these are just not my words.

National Institute of Deafness and Other Communication Disorders in the US has agreed with this.

So self-awareness is the key.

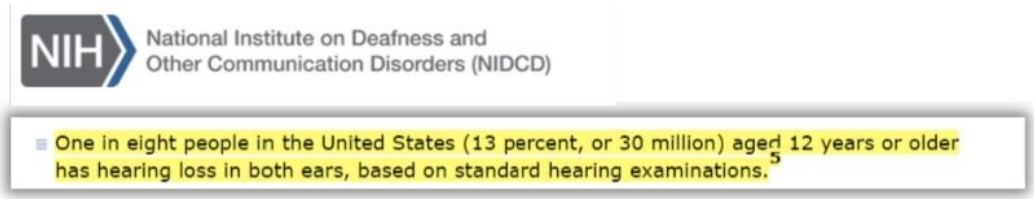
With this, let us find out the specific groups of people who are most affected by hearing loss:

NIHL has no age barrier. It can happen to everyone from children to older adults.

In fact, the 2011-2012 CDC Study has shown that at least 10 Million American Adults under the age of 70 has suffered from hearing loss in one or both of the ears.

The number goes to 40 million adults worldwide.

If you want to talk specifically about teens, then about 13 percent of them (aged 12 years or older) have shown signs of hearing loss in both years.



American Teen Hearing Loss

Ok, so what about occupational groups which are more vulnerable to hearing loss?

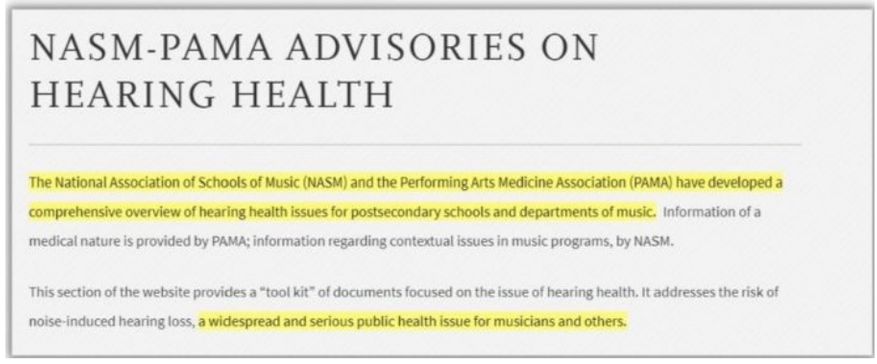
First group is: **Musicians**.

Musicians

Rock musicians face NIHL as they "are exposed to high decibel ranges". Symphonic musicians (that is classical music players) also suffer from hearing impairment and that "the impairment might be ascribed to symphonic music".

There are recommendations to protect hearing loss for musicians as released by NIOSH and NASM, but the situation on the ground continues to be challenging for our popular music artists.

NASM NATIONAL ASSOCIATION OF SCHOOLS OF MUSIC



NASM-PAMA ADVISORIES ON HEARING HEALTH

The National Association of Schools of Music (NASM) and the Performing Arts Medicine Association (PAMA) have developed a comprehensive overview of hearing health issues for postsecondary schools and departments of music. Information of a medical nature is provided by PAMA; information regarding contextual issues in music programs, by NASM.

This section of the website provides a "tool kit" of documents focused on the issue of hearing health. It addresses the risk of noise-induced hearing loss, a widespread and serious public health issue for musicians and others.

Hearing Health Advisory to Musicians

Hearing protections and earplugs are recommended for musicians but they come with their own set of limitations.

Many music artists believe that if they put protective gear (like earplugs), they will not be able to hear the music sounds clear. They feel that hearing protections can make their listening too quiet to hear important notes in music which is important for mixing and vocal recording.

Again, changing the environment in which the musicians work can help musicians fight hearing loss. This includes adjusting the sound level of their speakers and adjusting the layout of a band or orchestra.

However, accomplishing these changes in the environment is not always possible. This can be because of the lack of scope to adjust or other similar factors.

Obviously, awareness programs and working with health care professionals can help musicians fight hearing loss from loud music.

(Follow this guide to know effective preventive measures yourself)

However, despite being a serious issue, rates of hearing disorders in musicians is much lower than this occupational group:

BBC

Musician wins landmark ruling over ruined hearing

By Clive Coleman
Legal correspondent, BBC News

Musician wins hearing loss case

Real-Life Example: Chris Goldscheider, a musician fought and won a case against Royal Opera House for **damaging his hearing** in the rehearsal of Die Walkure, the Wagner's thunderous Opera. Consider this as your motivation to fight NIHC ☺

Second Group: **Industrial Workers**

Hearing Loss faced by professionals

Hearing Loss at workplace is very common. And the numbers are staggering.

More than 22 Million US workers are exposed to dangerous sound levels and millions more are exposed to hazardous metals and solvents that could lead to hearing ailment.

In total, occupational exposure to noise causes 16% of hearing loss cases to adults worldwide. Here is the list of occupations that suffer the most due to NIHL:

- Mining (49% of male miners have suffered hearing loss by the age of 50)
- Construction (58% of construction workers in the US suffer from significant abnormal hearing due to noise exposures at work)
- Military (1.25 US veterans suffer from hearing loss because of working in adverse conditions)
- Transportations (Nine and 12.6% of truck drivers suffer from hearing deficiencies in the left and right ear respectively)
- Agriculture (78% of US farmers believe they have hearing loss but only 4% use protective equipment)

The list is endless.

But nothing can be more serious than this....

Here is the Biggest Culprit of Hearing Loss

The culprit of Hearing Loss

And there is a reason why we call it, the biggest culprit.

Just imagine, occupational exposure to loud noise is a serious health hazard. Practical experiences and scientific data both suggests so.

But what if you invite hearing loss by yourself?

Enter: **Recreational exposure to loud sound**.

During the FIFA World Cup in 2010, noise levels created by fans reached at a staggering 144dB, louder than a jet engine at takeoff.

Remember that the recent CDC study we told you earlier?

That same study revealed that every 1 in 4 young US Adults is suffering from hearing damage outside the workplace. These people in their 20s had good to excellent hearing but they are now facing a distinctive drop in their ability to hear "high-pitched sounds".

CDC Hearing Loss Study

What we knew earlier that older people naturally have hearing loss due to biological reasons. But such increasing trends of NIHC among the next-gen is raising a serious alarm.

Apart from loud stadiums with fans beaming with cheers, there is another major reason for this hearing ailment.

And that is, excessive and indiscriminate use of portable devices like **headphones**.

But how can headphones lead to NIHL?

We will come to know in the next chapter:

Chapter 2: Here's How Headphone Use Leads To Hearing Loss

Here, I will introduce you to **Amanda**.

Amanda

Amanda enjoys listening music through headphones. Metal bands, jazz and DJ music drives her crazy like anything.

The other day, she was fully immersed in a three-hour long concert by her favorite metal band from Norway. She was so thrilled with the music that she even forgot to have her dinner that day.

After listening to the whole concert over headphone, she called her friend **Ishamel** to talk about the show.

But she noticed something strange. She found it difficult to talk to her friend over phone. There was a constant ringing in her ears and her friend's voice sounded like a person from the other room.

What caused such ringing sensation to Amanda after listening to the concert? We will find out in this chapter.

The Science Behind Human Hearing

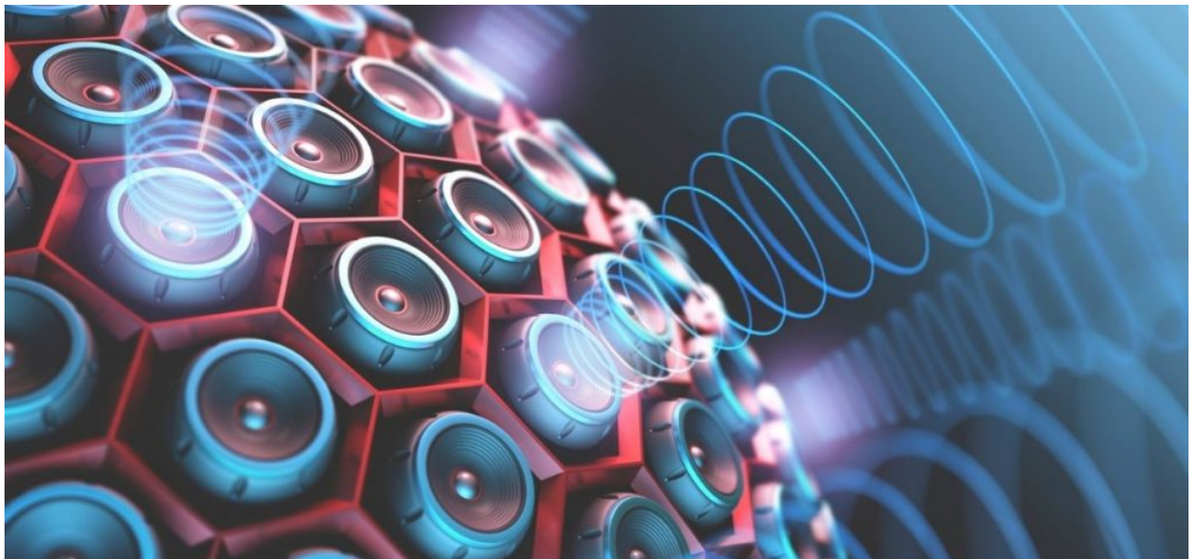
To find the root of Amanda's problem, let's first understand how our ears perceive different sounds all around us.

If you through a pebble in a still pond, it creates ripples in the water, right? Similarly, any type of sound creates vibrations in the air around us.

Here is how you can put this as a definition:

> "***Sound is created when displaced molecules vibrate through space***".

Sound vibrations are like a superman! They can travel through both solids and liquids.



Sound-Vibrations

And our ears? They are supporting amazing people like you and me! Human ears have evolved to evaluate vibrations in the air caused by the sound waves.

Here the journey begins:

Air vibrations get a sweet entry into our ear canals and bounce off the eardrum.

(Well if you hear loud noise beyond the threshold limit, it will not be *that sweet*. But more on that later)

These air vibrations now take the help of an ossicular chain, a trio of bones inside your ear, and reach the cochlea. Now our guest, that is air vibrations caused by sound, transforms. From waves of air pressure, it becomes waves of cochlear fluid.

This transformation gives us the first perception of what the sound is.

The waves of cochlear fluid reach to a tissue named basilar membrane which is lined with numerous delicate hair cells.

As the hair cells vibrate with the stereocilia on top of them, a special auditory signal is generated which our brain uses to identify the sound.

But remember one thing: these hair cells are very sensitive. And once eliminated, these cells don't regrow in humans.

Ok, so you knew how we hear sounds around us. But our question remained unsolved. How did the loud concert music damaged this delicate cells in Amanda's ear?

Let's find out here:

Here's Why Your Ears Can Be Damaged Due to Headphones

ear pain

Now, I thing is for sure:

Sound vibrations are truly a superman!

But you don't want to fight against him like Batman, right?

This is because your hair cells are sensitive and they can get damaged mainly due to the following properties of sound:

The first is **sound duration**.

Your hair cells can suffer injury due to repeated exposure to **low-pressure sound for long periods**. Amanda heard the concert music at low volume, but she heard it for three hours straight on her headphone.

These extended hours of listening lead to swelling of hair cells' supporting tissue and overwork the stereocilia on top of it.

As your hair cells swells up, they cannot vibrate with the accuracy and speed as required.

This makes your hearing muffled and you may get the ringing sensation like Amanda. Audiologists call this sensation "tinnitus".

Hearing to a hairdryer for 8 consecutive hours can also cause this type of hearing loss, also known as "**temporary threshold shift**". Each one of us may face this ailment at least once in our lifetime.

Next cause is **sound volume**.

noise

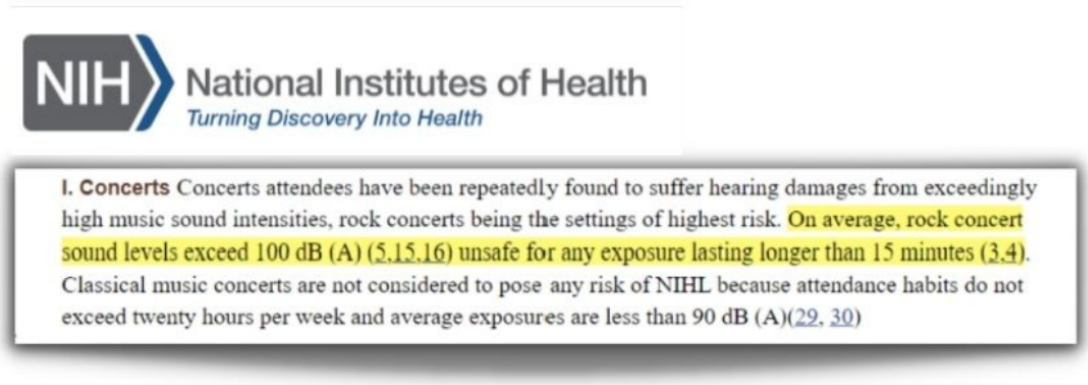
You may have guessed it already. Louder the sound, more the pressure of its air vibrations which can burst the eardrum and even dislocate the ossicular chain.

Everyone has its own limit of hearing sound.

But exposure to sounds more than 120 decibels can **instantly result in permanent hearing damage.** Such high volume noise can blow out your hair cells causing irreversible damage.

This is because of hair cells in humans don't regrow like in fishes and birds.

Listening in a rock concert where the sound levels exceed 100dB can damage your hearing within 15 minutes.



Permanent Hearing Loss

Hair cells get overworked due to sudden exposure to loud sounds and generate reactive oxygen species, a dangerous molecule with unpaired electrons. These molecules steal electrons from nearby cells causing **permanent damage to the inner ear**.

Luckily in Amanda's case, her hearing was restored in next day's morning. She only experienced the temporary threshold shift the other night and easily talked with Ishamel the next day.

permanent damage

She consulted with a doctor who told her that one night of temporary threshold shift will not cause permanent hearing loss.

But she was warned not to listen metal band music and such other stuff through headphones for three hours straight.

She was also advised to avoid certain sounds beyond a certain range. We will come to know about them in the next chapter:

Chapter 3: How Loud is Too Loud?

Amanda never knew that noises from even everyday activities like in fitness classes and events like movie theaters can reach to dangerous sound levels.

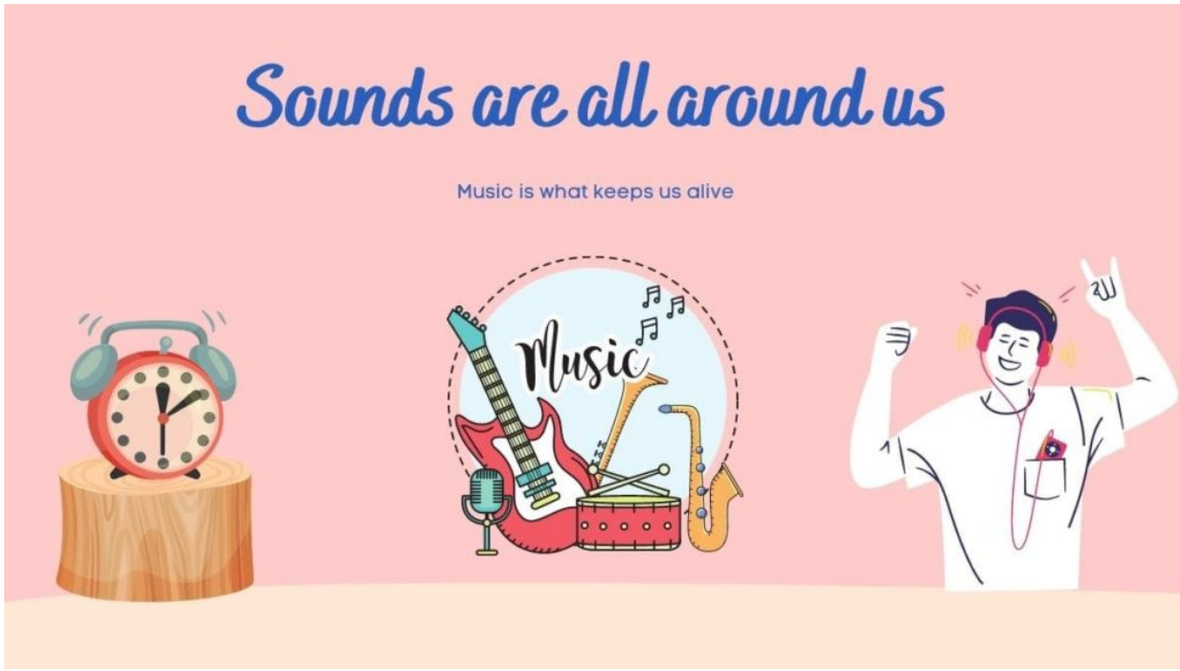
Then of course, the loud volume from personal audio devices like headphones and speakers is a threat to healthy hearing.

And there is one more catch: You may hear noises louder than people around you.

We will cover all of this in this chapter.

Let's dive in:

Here's How We Measure Common Noises From Our Daily Life



Sounds are all around us

Sounds are all around us. We wake in the morning with the ringing of our alarm clocks and end our day with a sweet music through our earphones.

But not all sounds fall under the category of “noise”.

“Noises” are unwanted sounds which can damage our hearing. The keyword here is: **unwanted**.

Remember the two ways through which we can suffer hearing loss?

> Most of us will suffer some sort of **temporary threshold shift** due to constant exposure to sound levels over 85 decibels or dB(A). Constant exposure is the key. Since these noises are so common in our day-to-day life, we barely notice them until they cause damage.

But sudden exposure to noise over 137 dB(A) can cause instant hearing loss. Permanently.

But how we will measure everyday noises to avoid damage?

The answer: **Decibel scale**.

Decibel scale measures the air pressure exerted by the noise on a logarithmic scale (based on the power of 10). The reason is simple:

Human ears response to sound levels is also logarithmic.

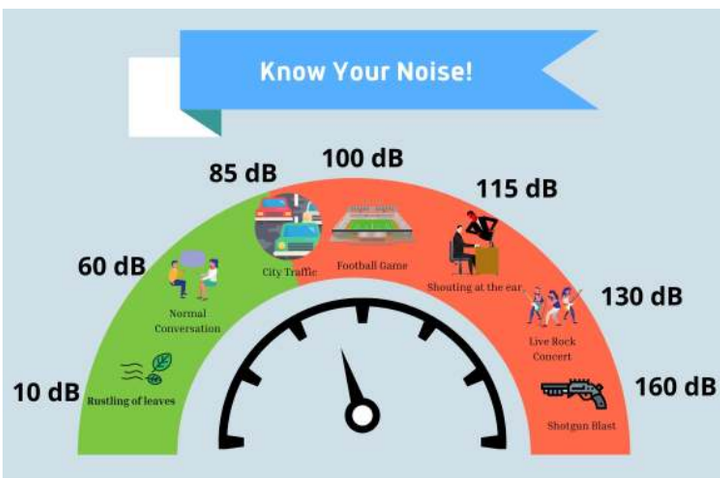
The logarithmic basis of the decibel scale means that the sound intensity (the amount of sound energy in a closed space) grows rapidly. Technically, **exponentially**.

This means that a sound at 100 dB(A) is **one billion times more powerful** than a sound at 10 dB(A).

One Billion Times!

With that being said, let’s find out the decibel levels of some common noises in our daily life:

And Now, The Loudness And Impact of Familiar Sounds and Noises



Know Your Noise

This table and graphic will help you understand the intensity and impact of some familiar noises in record time:

Common Sounds To Hear	Sound Level in Decibels (in Decibels)	Impact on Your Ear (after repeated exposure)
Rustling of Leaves, Normal Breathing	10	No Impact
Soft Whisper	25	No Impact
Air Conditioner, Normal Conversation	60	No Impact
Dishwasher, Washing Machine, Vacuum Cleaner, Toilet Flushing	70	No significant damage, but the noise is annoying
Noisy Restaurant, City Traffic (heard from inside a car), idling bulldozer	80-85	The noise is very annoying, can lead to stress
Leaf blowers, welder, Gas-powered lawnmowers	90	Hearing Damage possible after 2 hours of continuous exposure

Sander, Motorcycle	95	Hearing Damage possible after 50 minutes of continuous exposure
Sporting events (like football games and hockey playoffs), Handheld drill, car horn from 5 meters distance and approaching subway train	100	Hearing Loss possible after 15 minutes of constant exposure
Chain saw, the maximum sound level of **headphones,** and other audio devices, loud entertainment venues such as rock concerts and bars, a very loud TV, radio, or stereo.	105-110	Hearing Loss possible after 15 minutes of constant exposure
Riveter, barking in the ear, shouting	115	Hearing Loss possible after 2 minutes of constant exposure
Jackhammer, standing near sirens, thunderclap from a nearby storm	120-125	Can cause ear injury and pain (from the inception)
Live Rock Band	130	Can cause pain and ear injury (from the moment you hear)
Firecrackers, Fighter Jet Launch	140-150	Extreme pain
Shotgun blast	160	Immediate damage to the ear
Rocket Launch	180	Instant Deafness

Source: Pulsar Instruments

Even after having this chart, Amanda's problem didn't solve.

How will she understand the decibel levels of noises around her everyday? Obviously, she didn't wanted that ringing sensation again.

So, her doctor prescribed her a **noise dosimeter**.

They are easy-to-wear personal sound exposure meters that are worn near your ear and reveal the duration and amount of decibel levels one has been exposed to.

Now Amanda can monitor her noise exposure each day and can get hearing protection based on her exposure.

(More on this later)

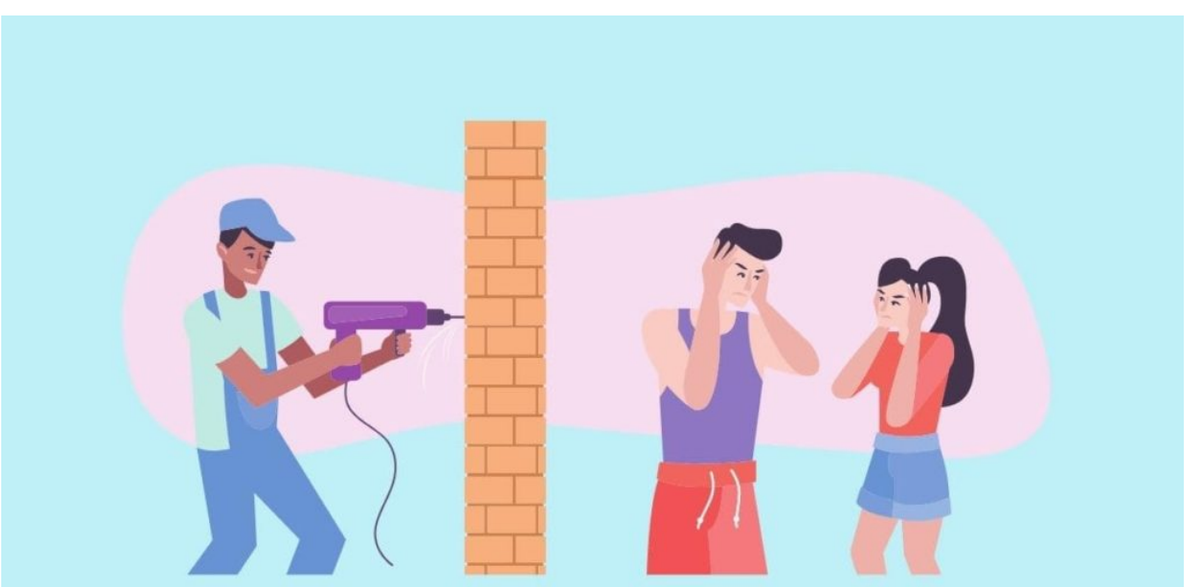
Other similar technologies include Sound Level Meter (SLM) to measure noises from your daily life.

You can take advantage of free SLMs in smartphone apps to better protect your hearing. These mobile apps (For eg. the NIOSH SLM app for iOS devices) can predict the maximum noise levels you can tolerate every day and suggest preventive measures.

Keep environment noise levels below 70 dB(A) over 24-hours duration and you will just be fine. Avoid annoying noises as listed above for longer durations.

But what if you are hearing sounds louder than other people around you?

A Unique Case Point: You Are Hearing It Louder



Along with Amanda, you now know about the decibel levels of some common noises familiar and around us.

Using Noise Dosimeter and SLMs, you can easily monitor your noise exposure to hear it safe.

So everything seems alright, right?

Until you start hearing certain sounds at unbearably loud **intensity** although your friends and family barely seem to notice them.

This can accompany with a ringing sensation in your ear. You know it already. It's called tinnitus.

Hmm... So what this fuss all about?

It's a hearing disorder known as **Hyperacusis**. It is commonly known as noise sensitivity.

Let me explain it further:

We have already discussed that intensity of sound depends on the energy it inhibits creating vibrations in the air. It is measured in decibels (dB). The list of sound intensity of everyday noises is given in the table above.

But remember, loudness of sound is not necessarily equal to its intensity. It depends on **how you perceive the sounds around you**. How you perceive is the key.

How we perceive sound

Your perception to audible sounds gets affected with the environment you are in.

The same sound which seems **loud** like that of a washing machine seems barely noticeable if your house is beside a street corner with heavy traffic although the intensity of both sounds is the same.

In simple terms:

How loud a noise is depends on where you hear and not what you hear.

So, if we live beside a road with heavy traffic or near a railway station, you are constantly exposed to loud sounds.

Hence, even if you go to a quiet place away from traffic, you hear common sounds (like a running faucet or a washing machine) louder than others. This health condition can take the form of disorder due to constant exposure leading to **Hyperacusis**.

Here are some of its common causes:

- Depression (Not a random feeling of sadness but a chronic condition of loss of interest which cuts you off from the outer world)
- Chronic Fatigue Syndrome (Disorder causing unreal and extreme tiredness)
- Posttraumatic Stress Disorder (PTSD)
- Migraine Headaches
- Autism (Very common in children. 1 in every 54 US children aged 8 years or above is reported to have autism as per 2016 data)

Apart from these chronic disorders, even exposure to a loud gunshot or a injury to your head can also lead to noise sensitivity.

But luckily, hyperacusis can be reversed. Cure for this disorder include sound therapy where you need to wear some special ear pieces to get used to common sounds again.

Beat-Anxiety-with-Therapy

Doctors also recommend Cognitive Behavioural Therapy (CBT) to reduce anxiety related disorders leading to the problem.

For Amanda, Hyperacusis, or whatever it is called, doesn't matter much.

Her problem was related to hearing inability after listening to concert music over headphone. Such threshold shifts are very common.

Whereas noise sensitivity affects only 1 in 50,000 people. The cases of such ailment is very rare.

how-many-have-noise-sensitivity

(Anyway, you can also check out this excellent resource on Hyperacusis for further reading)

Amanda's concerns are different.

As a next-gen jazz lover, she loves to put her earbuds on to cut off from the natural world.

But are they safe than over-ears?

Earbuds vs Headphones

Chapter 4: Earbuds vs Headphones For Hearing Loss

Amanda is not alone. Going wireless is indeed the new trend among the next-gen. You listen music in full privacy without any hassle.

But every good thing comes at a high cost.

Is the cool wireless earbuds more dangerous for hearing than the over ear headphones?

We will find this out here.

The Truth About In-Ear Headphones

Recall what we have known earlier. Hearing damage depends on the loudness and duration of sound.

So it doesn't matter if you are using earbuds or headphones. If you love to hear the music at the maximum, your ears are not safe.

Having said that, there are a few concerns about listening with earbuds:

First, in-ears deliver sound into the ear canal directly without any leakage. Hence, the risk at loud volumes increases further.

Secondly, there is the **vicious cycle of hearing loss**. It goes something like this:

Due to loud volume and deep penetration of earbuds, small hairs inside the membrane starts to degrade. As a result, you miss out on low-frequencies in your favorite piece of music.

Now, you are like Amanda. Carefree jazz lover who cares only about her metal band members.

So you increase the volume of your earbud further and try to block external noise. This makes your hearing problem go from bad to worse.

Hence, in-ear headphones tempt users to increase the volume. And subsequently trap in the threshold shift.

You barely notice any ailment before much of the damage is done. Your eardrums go through tremendous physical strain and tiny ear muscles develop **listener's fatigue** due to repeated oscillations.

Compared to this, over-the-ear headphones create a buffering space between your music and the ear canal. This prevents your ears to come in direct exposure to loud sound.

Again, they arguably deliver better sound quality than the earbuds with more bass-filled tones. Hence for any jazz lover like Amanda, it will be a much better option than earbuds.

Plus, they are more comfortable to wear in most cases.

What Do The Experts Say on Earbuds?

Let's get the experts do the talking for this section.

First is Dr. Pauline Dinnauer, AuD. She is the Vice President of Audiological Care at Connect Hearing

Dr. Pauline Dinnauer

> "Over-the-ear headphones are a much better choice. Not only do you not have to worry about funneling sound directly into your eardrums, but most over-the-ear headphones are also, as a general rule, more comfortable to wear than earbuds."

She advises music lovers to keep the volume within 60% range and use "right" kind of headphones.

(More on this later)

Next, we come to Mr. Joy Victory, the Managing Director at Healthy Hearing.

Joy-Victory

> "Outside-the-ear headphones are a better option, as unlike earbuds which deliver music directly into the ear, they provide somewhat of a buffering space between the music and the ear canal."

He advocates using headphones which block out external noise along with the regular advice of keeping volume within the threshold limits.

Finally, let's hear what Dr. Maria Wynens, Au. D. from Atlanta Hearing Doctor has to say:

Dr-Maria-Wynens

> "While both earbuds and headphones present the risk of high decibel levels and long exposure, earbuds are actually more likely to cause damage."

So, it is pretty much on the wall:

Earbuds causes more damage to the ear than the over-ear headphones. They are more close to the eardrum and pushes you to crank the volume further.

But hey, headphones are not great either. Amanda knows this very well.

It is important to get the "right" kind of headphones that suites your need and allows you to keep the volume low.

And they should fit in your budget too.

So, what type of headphones are best for safe hearing?

Chapter 5: What Types of Headphones Are Safe?

Noise cancelling headphones

Here we discuss the most common type of headphones which are considered safe for hearing.

And we find out whether they are indeed good for safe hearing or not.

This will help you find the right type of headphones for music listening and jazz. Great for Amanda. Great for you.

Let's dive right in:

Are Noise Cancelling Headphones Safe?

Short answer: Yes. They are available in both premium and budget friendly options for all types of buyers.

Long answer: Well, the matter is little bit complicated.

There is no doubt that noise-canceling headphones are made to deliver safe hearing to users. In fact, the ANC technology was invented to protect pilots from the loud noise of the plane engine.

ENT Experts like Dr. Weil advocate them for hearing health:

I actually recommend noise-canceling headphones to help avert the health problems noise exposure can present. By neutralizing surrounding noise, kids can listen to music without turning up the volume so high that poses a risk to their hearing. The sound quality of the music (or whatever else you're listening to) may not be as good as it is with non-canceling high quality audio headphones, according to a 2007 review of these products I read in *The New York Times*, and with some of these devices you can hear a hissing noise when music is not playing. But overall, I think you would be doing your kids (and their hearing) a favor by giving them noise-canceling headphones.

Dr.-Weil-on-Noise-Cancelling-Headphones

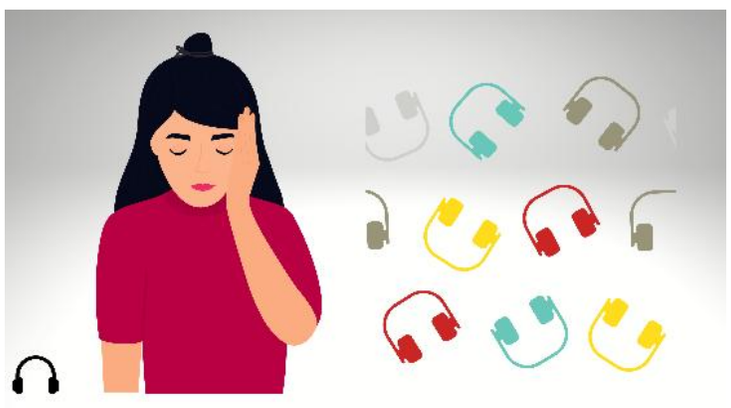
There are 2 types of noise cancelling used in headphones:

Passive Noise Cancellation or PNC creates a physical seal over your ears so you hear less background sound like city traffic.

Active Noise Cancellation (ANC) works differently. It produces an opposing frequency sound **electronically** to cancel out the ambient noise around you.

So, if these headphones are built to eliminate noise, where lies the problem?

First concern: **Ear Pressure**.



ear pressure

This happen with ANC headphones. Such headphones cancel out low frequency sounds, thereby increases the air density inside your ears.

As a result, your inner ear vibrates less and you experience headaches, jaw pain, dizziness and of course, **pressure on your ears**.

(In fact the experience with ANC is very similar to taking off in a plane)

Some people don't face any such symptoms at all as they become adapt to the ANC. Others face symptoms only during extended usage.

The sad part is:

> *There is no cure for this headache symptoms using ANC. But PNC doesn't suffer from this problem so you consider switching your headphones for safe hearing.*

You can refer to this study (though *skewed*) on *Wirecutter* staffers about their experience with ANC headphones:

T | Wirecutter

We began by polling 70 Wirecutter staffers to get a better idea of what people's experiences with noise-cancelling headphones have been. Of the 34 who said they had used noise-cancelling headphones, 18 (52 percent) said they had experienced some level of discomfort—which they described as a pain in their ears, a feeling that their ears needed to pop, dizziness, headaches, or nausea.

Wirecutter-Study-on-ANC

The second concern is: **Dangers of Outdoors**.

using headphones out door

As noise-cancelling headphones are built to cut off external noise, you are more likely to use them amidst busy traffic and public places.

This closes our most important sense organ to recognize danger.

You fail to notice car horns, fire alarms and other important alerts amidst the heavy traffic.

This exposes us to dangerous car accidents. In fact more than 37 Million Americans have put themselves in danger by using headphones during outdoor activities:

Audio Analytic

May 14, 2019

New research shows that a staggering 37 million Americans and 12 million Brits feel they have put themselves in danger over the past 12 months when wearing headphones or earphones while walking, jogging or cycling. Examples included stepping out into a road, bumping into somebody or not hearing an emergency vehicle approaching.

The worst part?

Majority of people admit that the dangers of using headphones outdoors. 97% consider it dangerous to use headphones while driving while the admission numbers for cycling, running and commuting on public transport goes to 94%, 88% and 69% respectively.

So the best thing we can do is to stop using noise-cancelling headphones while outdoors. We need full attention of our senses for a lightning-quick response if anything goes wrong in a busy street or while driving, so precaution is the best cure.

> Headphone manufacturers should also take advantage of sound recognition software like ai3™ created by Audio Analytic to help users remain alert to sounds like sirens, alarms, and car horns even while wearing ANC headphones. But this might increase of production cost of these headphones, reducing the profit margin.

Again, using noise-cancelling headphones in super quiet places as a study hall or library can cause a ringing sensation or tinnitus in the ears as the ambient noise comes close to zero.

Here is the bottom-line:

PNC headphones are the best because they protect you from sudden loud noise and don't cause any headache. They are very useful for construction workers and pilots who need to work and communicate even amidst dangerous noise.

And never use noise-cancelling headphones while you are outdoors. Keep your health ahead of your entertainment.

(But like Amanda if music is your life too, keep reading to find a better alternative)

Are Bone Conduction Headphones Safe?

bone conduction headphone

Before we answer this question, let's find out why manufacturers call it a "godsend device" to protect hearing loss and risks of using headphones outdoors.

Bone-conduction headphones work on an entirely different technology.

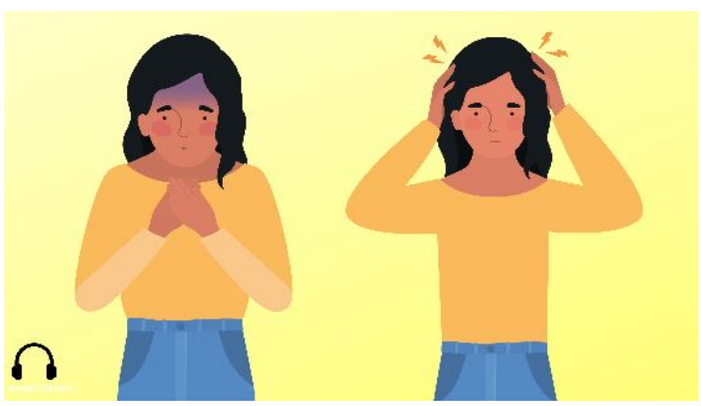
Most headphones use speakers or drivers to produce sound, which is sent through air vibrations into the inner ear. We have discussed this earlier.

But bone conduction devices send sound vibrations through the **skull bones and the jaws** to the cochlea from where it reaches the brain. It bypasses the eardrum altogether.

Just like how you can hearing your chewing inside your head, you can hear music from these headphones inside the ear, not outside.

Bone conduction has been used to treat hearing loss since a long time but using this technology in headphones doesn't necessarily make them best for hearing.

Here is why:



headache and dizziness

Just like their noise-cancelling counterparts, bone conduction headphones can also cause headaches, dizziness, or vertigo as they usually rest on your temples. Intense sound vibrations leave a weird feeling on your cheekbones.

Again, they can put excessive pressure on your head if not worn properly.

Some people also experience skin irritation if these headphones are worn for extended periods of time. Pressure on the skin above your ears is also faced during long usage.

Finally, know one thing:

Hearing damage is caused when serious damage is inflicted to the cochlea in the inner ear:

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Loud noise is particularly harmful to the inner ear (cochlea). A one-time exposure to extreme loud sound or listening to loud sounds for a long time can cause hearing loss. Loud noise can damage cells and membranes in the cochlea. Listening to loud noise for a long time can overwork hair cells in the ear, which can cause these cells to die. The hearing loss progresses as long as the exposure continues. Harmful effects might continue even after noise exposure has stopped. Damage to the inner ear or auditory neural system is generally permanent.

Hearing-Loss-due-to-inner-ear-damage

So, bone conduction headphones are not 100% foolproof or a "**Godsend**" to eliminate hearing loss as claimed by the manufacturers. Don't fall prey to the misleading ads which say otherwise.

Having said this, bone conduction headphones are best to listen to music outdoors. Your ears are free and you can be aware of your surroundings even when you are immersed in the music.

In this way, it is better than noise-cancelling headphones.

Professionals like cyclists, runners and even soldiers can benefit from bone conduction headphones as it helps to remain aware and still communicate in adverse conditions.

Patients who suffer from eardrum damage can use them to enjoy their favorite songs by bypassing sounds directly into the inner ear.

Again, you can easily wear these headphones with safety gears so that you don't sacrifice your music while out on an errand.

Hence, your question is resolved:

If worn carefully and used in safe volume limits, bone conduction headphones can be very helpful to protect your ears, be aware of your environment and still enjoy your music.

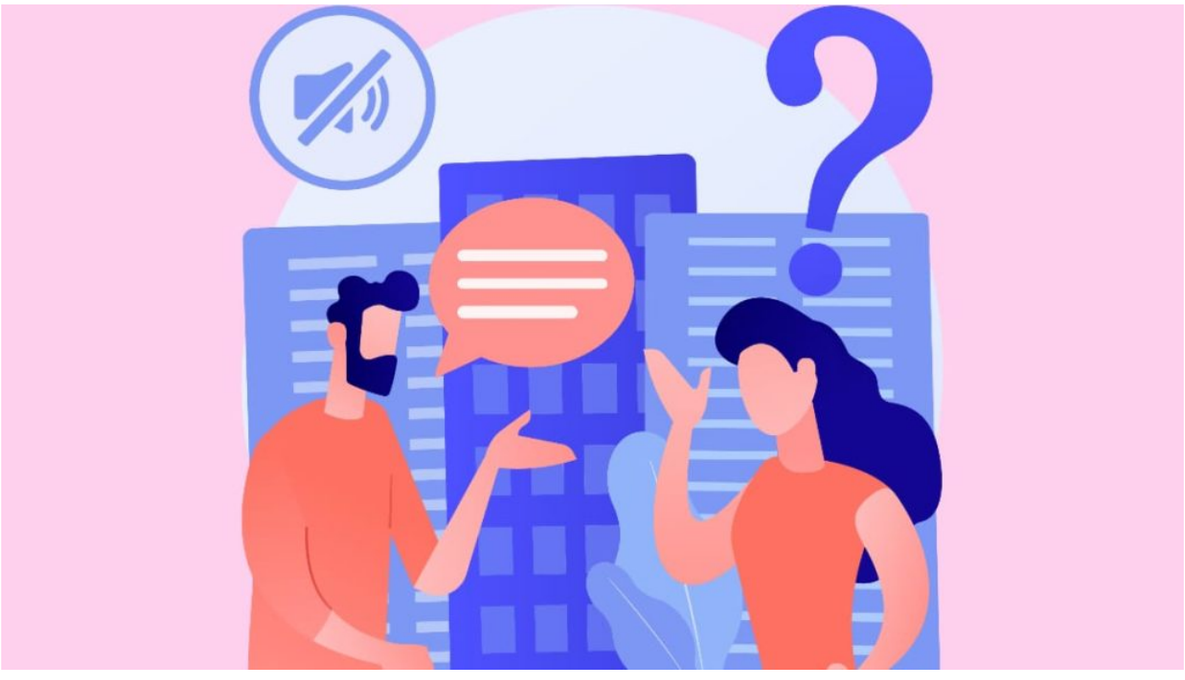
And they serve your purpose better than the noise-cancelling ones.

Amanda is now getting impatient.

For so long I am promising of definitive preventive measures against hearing loss. Specifically for a jazz lover like her.

I guess you must be getting impatient too.

Well, your wait is finally over!



Hearing Loss

Chapter 6: Prevent Hearing Loss From Headphones

Hearing loss detaches you from normal life. It leads you to isolation and even chronic sadness or depression.

So, prevention is very critical for everyone.

And in this chapter we will provide you the expert tips to help prevent hearing loss from headphones.

(There is an awesome surprise for you as well)

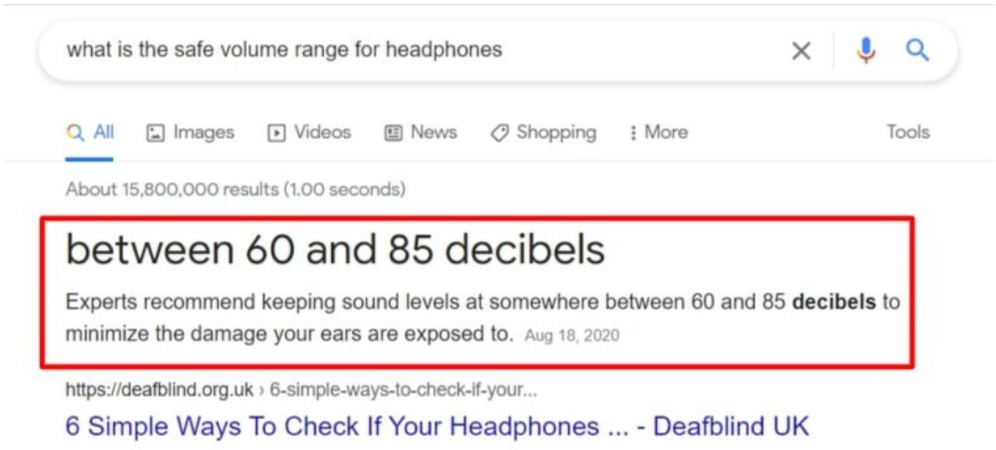
Let's get started:

#1: Lower the Volume

volume

Seriously. This simple tip can lower your risks of hearing loss like anything.

Keep the headphone volume not more than 60 to 85 decibels for safe listening.



safe volume range for headphones

There are some simple techniques to keep your volume low (and still enjoy music):

Clean your headphones so that they seem loud even at low volumes.

And never increase volume to cut off external noise. In a busy traffic or while driving, this mistake can prove to be fatal.

Check out signs whether your headphones are too loud. If your friend sitting beside you can hear the music through the headphones, they are perhaps too loud.

(More on this later)

You can also set up a volume limit in your music device for safe hearing. Go to **Settings** > **Music** > **Volume Limit** to customize your volume for iPhones. Android users can find their volume changing settings in a similar fashion.

If this does not help, go and check the device manual.

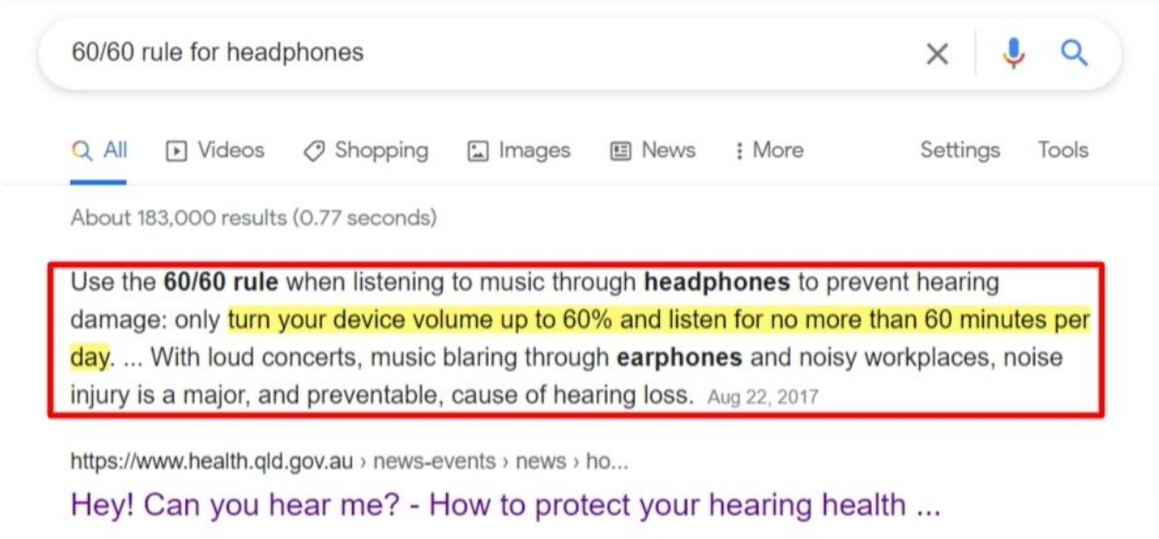
#2: Apply the 60/60 rule

60/60 Rule in hearing loss

Its indeed simple and definite for hearing loss prevention. Here is what you need to do:

Listen music at 60% of the maximum volume for not more than 60 minutes a day.

(You can extend this up to 80% if you wish to listen in batches for not more than 90 minutes a day)



Rule-For-Safe-Hearing-

The logic here is simple. Recall the 2 causes of hearing loss:

Noise intensity and the duration of sound.

And this rule tries to limit both these factors so that your ears are safe for the awesome tunes you like to enjoy everyday.

If you use an MP3 player and belong to EU, there is one more thing you can do:

Utilize their "smart volume" feature to listen within the safe limits.

Always remember: **Listen it right to listen for long.**

#3: Use Soundproof Earplugs, Take Breaks

take a break

Amanda got the temporary threshold limit after listening to her favorite metal band for 3-hours straight. Through her headphones, obviously.

Many of her friends love to enjoy rock concerts with physical presence for having a good time together.

So, to **listen it right**, it is better to use protective gears like earmuffs or earplugs in such venues.

Such devices can lower your decibel exposure by 15 to 35 decibels. They are widely available in popular music venues and don't usually spoil your listening.

But remember, the effectiveness of an earplug depends on how well you have inserted it in the ear. So, read the instructions very carefully.

Earplugs are also helpful when you are using noisy equipments like power drills or lawn mowers. In this way you can focus on the work and don't get distracted with the noise.

And don't forget to take a regular 10-minute break to give the much needed rest to your ears.

#4: Take Hearing Tests

hearing test

Often we hear people taking regular health check-ups for their teeth, eyes, blood pressure, diabetes (sugar) and so on.

But never for their ears.

Just like any other part of your body, your ears too need regular check-ups. This helps you get a baseline understanding of your hearing which is beneficial for a well-functioning auditory system.

I know what you will say: We don't have access to audiologists and can't bear their fees.

Then, you should know that there are numerous easy-to-use mobile apps (like **Play It Down** or **SoundMeter+**) for taking portable hearing tests anytime anywhere. They are developed by premier hearing organizations and are absolutely free of cost.

Check out this hearing health app developed by WHO to understand what I mean.

#5: Use "Right" Kind Of Headphones, Not Earbuds

use headphone not earbuds

We have discussed this in detail in the last chapter. "Right" kind of headphones are the ones which match your need, come within your budget and still gives you good hearing protection.

Firstly, avoid using earbuds. They sit too close to the ear and tempt you to increase volume trapping you in a vicious hearing loss cycle. Use actual headphones which maintain a good distance between the source and your eardrum.

And when it comes to best headphone choice, noise-cancelling headphones is a common advice you will find across the web. But as we already know, this advice is vague.

You should use PNC headphones because they protect you from sudden exposure and don't cause headaches. But bone conduction headphones can be very useful for all music lovers who want to immerse in music amidst heavy traffic.

The reason is simple. You continue remaining aware of your surroundings even when you enjoy music.

But again, you should never use headphones while driving. Music systems inside your car are a safer option.

Be careful about the size before buying headphones. Proper fit is important for long term use.

And always listen within safe limits ☺

#6: Avoid Loud Noises

avoid noise

This advice needs no introduction. Refer to this table we gave earlier to know about the common noise levels around our daily life so that you avoid them easily.

It is important to prevent loud noises in your workplace as well. Talk to your HR Manager if you face loud noises in work and he is obliged to take steps accordingly.

This can include providing you quieter equipment to work with or giving you hearing protection like earplugs.

Use them carefully and you will just be fine.

You can also use PNC headphones to avoid sudden exposure to loud noise.

And Here Is Your Awesome Surprise!

Ok, so I promised you a surprise for this chapter.

Let me unbox it. It's an infographic on how to prevent hearing from headphones:

Prevent Hearing Loss From Headphones

(Don't forget to share your feedback on this)

Finally, Amanda is happy as she knows just how she can prevent hearing loss even while enjoying her favorite music. She has disregarded earbuds and chose PNC headphones for her jazz songs.

Now, she is following the 60/60 rule religiously.

But I cannot let her go before this bonus lesson:

Chapter 7: Bonus Tips For Healthy Hearing

listening to music

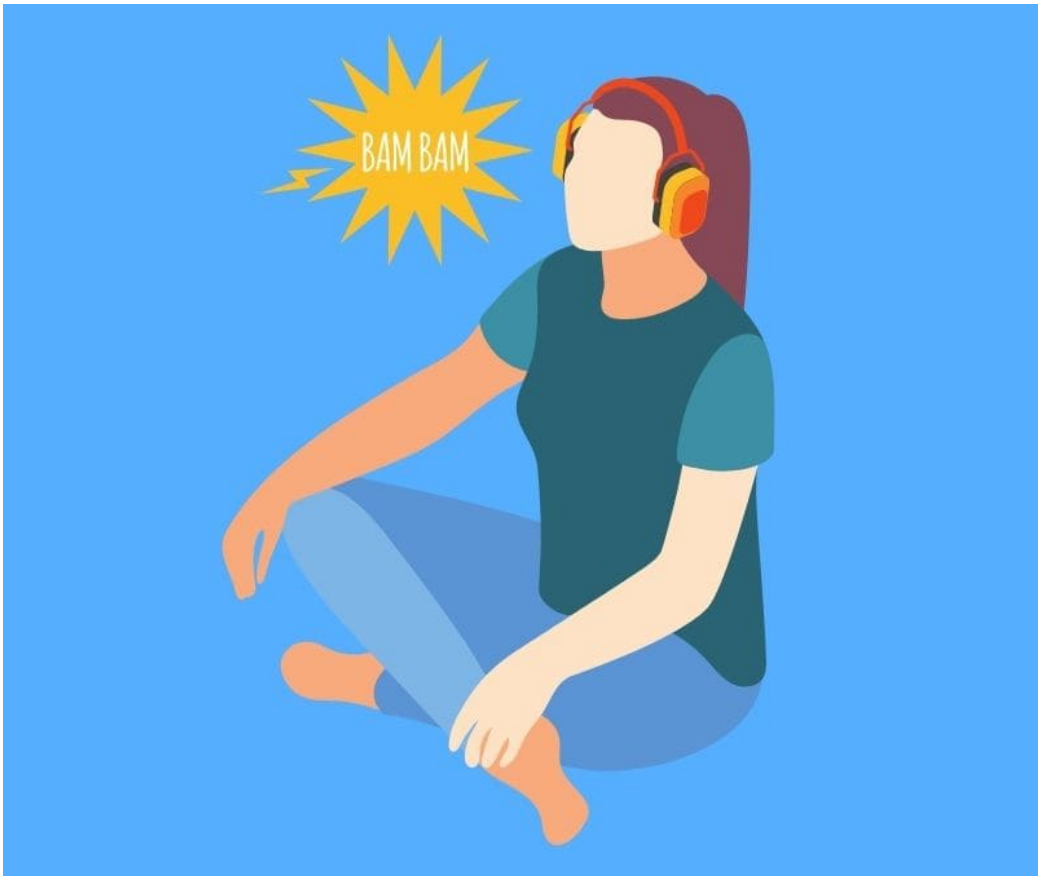
Well, if you are been with us for so long, you definitely care your ears above everything else.

Let's cement our hearing health awareness with this cool bonus tips.

(Plus, Amanda's has a new story to share about her friend Anja)

Let's start straightaway then:

Bonus Tip #1: Check If Your Headphones Are Too Loud



headphones too loud

We discussed this in #1 measure to prevent hearing loss.

In order to ensure that you are actually listen within the 60 to 85 decibel safe hearing range, you should perform this crucial check.

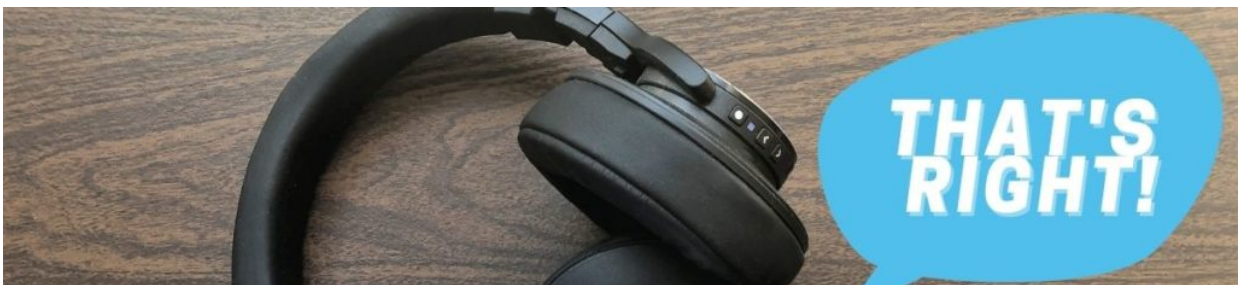
Here are some simple ways:

- Take a **hearing test** or lookout for signs for hearing loss to break the vicious cycle and seek treatment. If you are always tempted to increase volume or find it difficult to hear at crowded venues, you may be facing a threshold shift like Amanda. Again symptoms such as a ringing sensation in your ears (also known as tinnitus) also mean that your hearing is in danger.

- Your friend sitting beside you should not be able to hear the music played at your preferred limits. **If he can hear the sound being played, they are perhaps too loud.** You can also hold the headphones in front of you to check for loud noise yourself.

- Carry out the **ringing test**. Here is what you need to do: In a quiet room put on the earplugs. Try to relax and focus on your hearing. You should be able to hear a slight ringing sound. This is your **baseline** level. Now, again do the ringing test after listening with headphones at your preferred volume. If the sensation is higher, your headphones do have a problem.

Bonus Tip #2: Clean Your Headphones For Better Listening



Clean Your Headphones

This is the most simplest way you can use to listen music clearly even at safe volume limits.

You can use a small cloth, alcohol wipes or cotton swabs to clean your device. Gently remove the outer earpads and use alcohol wipe to clean them. As the air dries up, clean the crevices with a cotton swab.

Don't forget to sanitize the mesh to remove any dirt or wax. Make sure that all the sections of the headphones is fully dry before you assemble them.

Finally, you should always keep your headphones in a clean and dry place after use.

Take care of your headphones to take care of your ears ☺

Bonus Tip #3: Avoid Headphones While Sleeping

sleeping with headphone

Firstly, I am not against going to sleep while listening to music. In fact, different types of music at your bedtime are proven to relax your body, slow down your heart rate and focus on your breathing.

It's a great way to reduce stress throughout the day and help enjoy deep sleep. Your brain release happy brain chemicals like dopamine which makes you feel good. Insomnia and PTSD patients can benefit from bedtime music too:

Sleep Foundation
A OneCare Media Company

Using music can also decrease the time it takes to fall asleep. In a study of women with symptoms of insomnia, participants played a self-selected album when getting into bed for 10 consecutive nights [4]. Before adding music to their evening routine it took participants from 27 to 69 minutes to fall asleep, after adding music it only took 6 to 13 minutes.

In addition to facilitating quickly falling asleep and improving sleep quality, playing music before bed can improve sleep efficiency, which means more time that you are in bed is actually spent sleeping. Improved sleep efficiency equals more consistent rest and less waking up during the night.

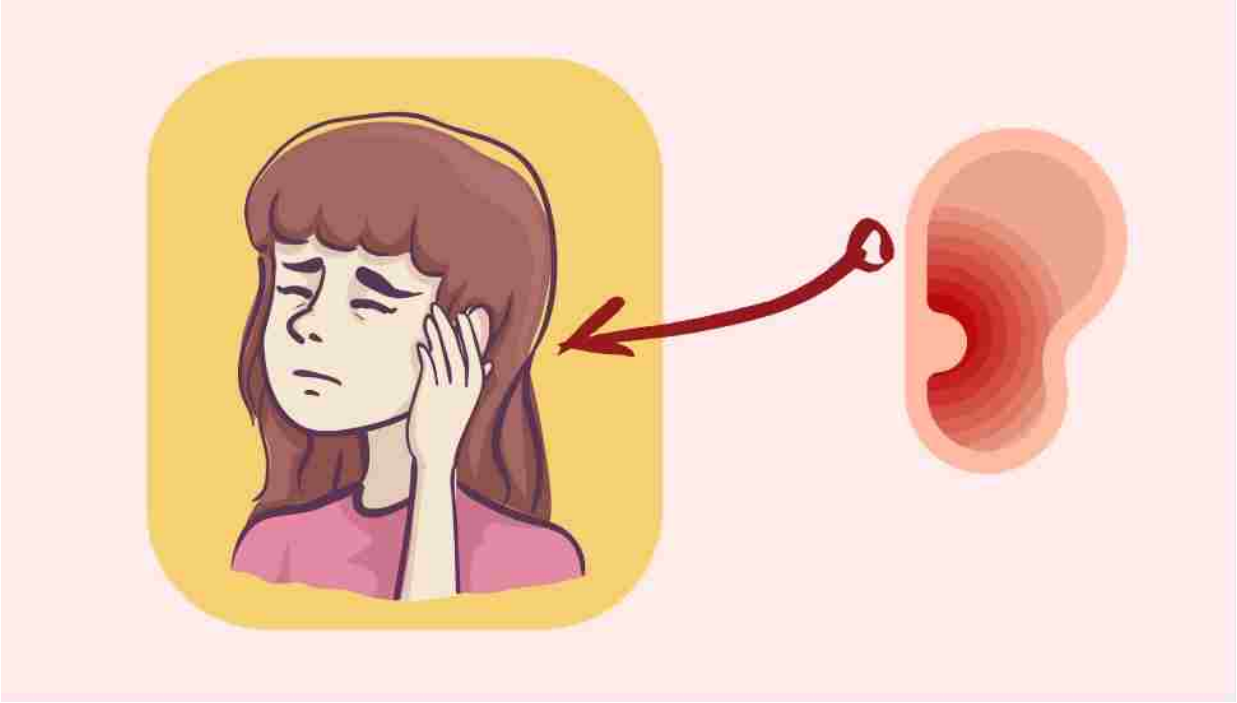
Music and Sleep

But the problem lies in listening bedtime music with headphones. They include:

- While we sleep we tend to be lazy and may accidentally turn up the volume. We already know that listening to music for over 85 decibels more than 8 hours every day can lead to hearing loss.

- Sleeping with earphones can buildup hard wax in your ears as the seal does not allow air circulation. If left ignored, this hardened wax can lead to a temporary threshold shift or even permanent hearing loss over time. In case you are already suffering from excessive wax, you need to consult an ENT specialist to clean your ear from unwanted wax.

- Regularly using earphones at your bedtime can cause the skin of your ear canal to wear out leading to a painful infection called *otitis externa*, also known as swimmer's ear. This infection prevents your ear to produce ear wax naturally as a shield against dangerous microbes and causes swelling, itching, and even diminished hearing.



ear infection

- Wired headphones can cause strangulation during sleep which may cut off your oxygen supply while you are in subconscious mode. Again, excessive use of headphones during sleep can lead to death of tissue cells impacting your hearing.

strangled by headphone

I know you will not get strangulated with wired headphones like this funny picture.

But my logic is simple. If there is even 1% chance of danger while doing anything while sleep, I will avoid it. In the end, we want to reduce stress during bedtime, not increase it.

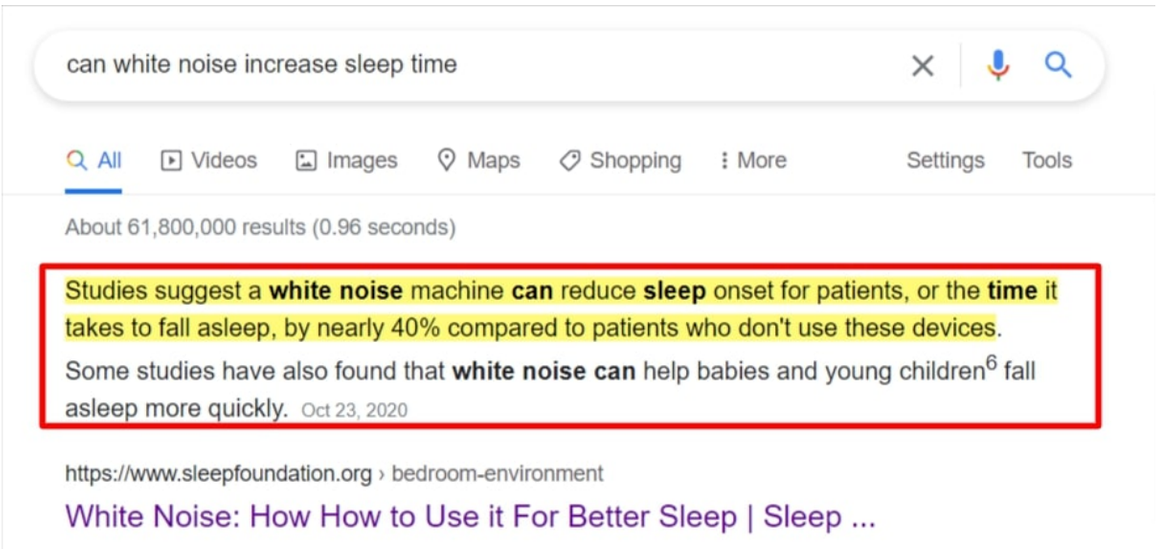
Here are the best ways to enjoy music during sleep while safeguarding your ears:

- Enjoy music on a portable or stereo speaker. You can play/pause, skip tracks or change the volume of the speaker from its remote control so that you don't have to get up from your bed. Connect your speakers with your smartphone to stream music via Spotify.

use speaker

(If you are like me and don't want to incur extra cost, listen music from your phone speakers. They can well serve your purpose without being too loud)

- Alternatively, you can invest in a White Noise Machine to cut off background noise and create an ambient sound like a wind blowing through the trees or a waterfall. Research has shown that white noise can increase sleep time and reduce stress:



White-Noise-Increases-Sleep-Time

Conclusion: Here Is The Story That You Have Been Waiting For

Amanda is eager to share the story of her friend Anja. She is just like her. Jazz lover and dedicated fan of a Norwegian Metal Band.

And just like her, she faced the threshold shift too.

Play the video to know the details yourself:

So, here ends our ultimate guide on hearing loss from headphones.

hearing loss pdf

Download now

Now, I head over to you.

Which technique will you use to **listen it right**? Are you going to apply the 60/60 rule or use earplugs in noisy environments?

Do tell me in the comments below.

(You can also offer suggestions to make this article more useful)

Amanda will love to hear your doubts on the topics we have covered here. An happy hearing to all of you ☺

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☐ Save my name, email, and website in this browser for the next time I comment.

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