

What is noise induced hearing loss?

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Noise-induced hearing loss is kind of what it sounds like it's it's hearing loss that is caused by exposure to loud noise and what we mean by loud in this case is usually anything greater than 85 decibels is kind of a cutoff point, it does depend on how long you're around the noise though, but just to be safe. Anything above 85 decibels could potentially damage your hearing.

Is noise induced hearing loss permanent?

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The good news is, it's 100% preventable. It is one of the few disorders that affects hearing that is 100% preventable. The bad news is that once you have noise induced hearing loss, it is permanent. And there's nothing we can do to reverse it. There's not a medication yet there's not a surgery, researchers do continue to work on and figuring out if that's something that could be developed but at this time, it's not reversible. What happens is loud noise comes into your ear. Initially, it may just cause some swelling to the very sensitive parts of your inner ear, you have tiny little sensitive hair cells in your inner ear so initially those hair cells, and the nerve fibers that are connected to them, may swell, but with repeated exposure, they actually can rupture and die. And in humans, hair cells in your inner ear are not, they don't regenerate themselves, and we have not yet discovered a way to regenerate them.

How loud are fireworks?

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Fireworks can reach levels from 140 decibels to 160 or so decibels, it does depend on the type of firework, and a big factor is how close you are to the fireworks. But if we're talking 140 to 160 decibels, that is very very loud, to kind of give you a frame of reference. That's louder than a jet engine. So, it that is not good for your hearing for you to be around noises that loud and in fact we know that at 140 decibels. That is a level that can cause immediate permanent damage to your inner ear so immediate permanent hearing loss.

When is the damage noticeable?

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It may be something you notice immediately. There are cases that where someone has a firework that goes off very close to them like maybe they're the ones setting it off and it goes off in their hand, where you may have immediate severe to profound hearing loss, that's not reversible there, it may be if you're further away, it might be a smaller amount of damage that maybe you don't notice right then. But the important thing about noise-induced hearing loss, is it builds up over time with repeated exposure so any of those loud exposures that you're around may be causing permanent damage, a little bit at a time.

How damaging can a loud sound be?

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The way that noise-induced hearing loss happens, a loud sound comes into your ear first it goes through your ear canal, it goes through vibrates your eardrum you have little middle ear muscles, and it gets to your inner ear where you have tiny sensitive little hair cells that are connected to your auditory nerve fibers. A couple of things can happen with typical noise induced hearing loss that's happening gradually over time, it's usually because those tiny sensitive hair cells have been damaged and or your auditory nerve fibers, but in extreme cases when you're around a very loud noise, maybe like a firework, especially if it were to go off close to you like in your hand which certainly there have been cases of that happening. That sound is so loud that actually can rupture your eardrum. It can rip apart, your little middle ear bones, and then it basically rips through your inner ear because those delicate little structures, just can't handle that extremely high sound pressure wave, that's traveling through the inner ear, and it just rips the tiny delicate little parts of your inner ear, and those things are not going to grow back we can, you can have your eardrum repaired. You can even have a little middle ear bones put back together, but that inner ear. It cannot be repaired so it's really important to remember that. And when you're when you're shooting off fireworks, that it's great it's fun and we all want to enjoy it but we really need to do it safely.

How to stay safe around fireworks and recommendations for infants.

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I think most of us love fireworks and we look forward to enjoying them around the Fourth of July so certainly we're not saying don't, don't be around fireworks. But it's important that you do it safely. So there are some different recommendations out there, one from the American Speech Language and Hearing Association, is that in order to safely view fireworks in terms of your hearing, you should be at least 500 feet away from the fireworks. If you're closer than that, you definitely should be wearing hearing protection. They also go on to say, and in other recommendations as well that infants should not be exposed to fireworks at all. And the reason being that we know that sound when it's presented in a smaller space it amplifies the sound, and so infants have tiny little ear canals. So the idea is that when a loud sound like fireworks comes along, it may be amplified in their little ear canals and actually put them at higher risk, even than someone with a larger ear canal.

What are the options for hearing protection?

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There are different options available for hearing protection both for children and adults, and it's, it's very important to know that noise induced hearing loss can begin at any age so it's important to think about kids being exposed to these noises as well as adults. So there are different options out there, all the way from the least expensive would be your foam earplugs that are disposable they're just meant to be used one time, they're very inexpensive. 50 cents apiece something along those lines. The downside, they can be very effective too but the downside of foam earplugs is that most people struggle to put them in properly. So with a foam earplugs you have to roll it down as small as you can get it. You have to pull up and back on

your ear to straighten out your ear canal and then you have to put the earplugs in quite deeply in order to get the proper amount of protection. And most people either don't know that or kind of struggle with it and so you'll see people with foam earplugs sort of sticking out here where you can see them, that that's not offering the protection that it needs to when they're worn properly, you really should not be able to see them unless you're looking at them from the side. So that's the downside one downside another downside of foam foam earplugs is that they're generally made in sizes that are more appropriate for teenagers and adults. They are the ones that you can go and buy most places are not going to be small enough for younger kids so. But another option is protective earmuffs so certainly they're more expensive than a disposable pair of foam earplugs but you can still get protective ear muffs that are, you know, under \$20 or around there. And the really nice thing about protective earmuffs is that they offer good hearing protection. And it's really difficult to wear them incorrectly, unless you do that on purpose because all you have to do is put them over your ears, and they work. they make them in different sizes to actually make them even though it's not recommended that infants be around fireworks, and they make infant size your protective earmuffs if you were needing to take your infant somewhere where there would be loud noise, and then they make them in different sizes for different ages of children and then of course, up to adult so that's a really nice option, you know, when we talk about hearing protection. In general, for people who are exposed to loud noise that other times, not just once a year for fireworks, then that's when we can start to look at something like custom earplugs, or you could see an audiologist we could make an impression of your ear and have an earplug made that fits your ear, and it's usually more comfortable for most people, they're easier to get in and then you know it's providing a nice consistent level of hearing protection. One other thing I do want to mention is, if you're going to be close to the fireworks especially if you're the ones setting them off, or even if your family and friends are going to be watching from close by. It is recommended that you wear earplugs with earmuffs over them in order to offer extra protection, partly because people struggle to get those earplugs in correctly, and then partly because just one alone is not enough if you're going to be very close to those loud noises.

What are some signs of hearing loss?

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First off, noise-induced hearing loss may start off as what we call a temporary threshold shift so a temporary change in your hearing. And so that's what most people, most people have experienced that at some point so that's when you're around a loud noise and then afterwards you notice that maybe your ears are ringing things, maybe your ears feel full are kind of stuffed up, and then things may sound muffled you may kind of be struggling to understand or catch some things, but the tricky thing is usually those symptoms slowly seem to get better after a kind of one incident of noise exposure and so people think, oh, it didn't do anything to my hearing I can hear fine again. I don't need to wear hearing protection, and so they just go about being around these loud noises, and not wearing hearing protection, but they don't realize is that every time you do that every time you experience those temporary symptoms. You may actually be left with a small amount of permanent damage. And it may take years before it's something that shows up on a hearing test or it may just take years before you start to notice it

in your daily life. That's, that's also why we, we recommend that people have. If you're around that noise that you have a regular hearing test, but also that you just keep in mind that just because you haven't noticed significant difficulties communicating in your daily life does not mean that you don't already have permanent damage.

Why is it important to protect your ears?

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People are really much better about protecting their eyes, they will wear you know safety glasses when they're they're using power tools and things because it's an immediate you're worried about an immediate injury, versus hearing protection, you can have immediate noticeable hearing loss, absolutely, especially when we're talking in that 140 to 160 decibel range for fireworks can be. But for a lot of people if it's not quite that loud, it usually happens very slowly and sneaks up on you. And then once it's there, it can't be reversed.

The importance of a full hearing test

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If you're around loud noises, it's, it's very important to have your hearing tested regularly so that we can monitor what your hearing looks like. But it's also important to keep in mind that a hearing screening may miss early noise induced hearing loss and there are a couple of reasons. With a hearing screening we just present the sound at the level that's the cutoff for normal hearing, and we only test at certain pitches typically. So if your hearing is still within the cutoff for normal, you might hear the beep, and you might get a pass on that hearing screening. But if we do a full hearing test where we actually find the softest sounds you could hear at all of the pitches that we test what we may see is a pattern that suggests noise-induced hearing loss, early noise-induced hearing loss. So, that's fine if you're around loud noise. Certainly start with hearing screening, but just because you get a pass on that doesn't mean that everything is fine. We'd really recommend that you have a full hearing test and that way we could start to monitor your hearing, because we certainly see those noise and what we call a noise notch which is a pattern of hearing loss, and it's still within normal limits in the early stages.

How common is noise induced hearing loss?

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Noise-induced hearing loss is actually more common than a lot of people might realize it's the second most common cause of inner ear hearing loss and it's second only to age related hearing loss so it's very common, a recent study in the United States, found that about 24% of adults had permanent noise-induced hearing loss. Some other studies have looked at children and for the general population of children about 12% of kids have permanent noise-induced hearing loss. What's interesting particularly for our area here in West Texas is that there have been studies that have looked specifically at kids in rural areas, and for kids in rural areas that number jumps up significantly from 12% in the general population to about 22% in rural areas. So that's really important to keep in mind that noise-induced hearing loss can start at any age.

Will most people notice hearing loss?

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Sometimes people already have permanent damage due to noise in the inner ear and they don't realize it yet. So, in, in the study that was looking at the the prevalence of noise-induced hearing loss they first asked, adults to rate what their how good they thought their hearing was, and then they later had a hearing test what they found was that around 25% to 30% of the adults who rated their hearing as being good to excellent actually had signs of permanent noise-induced hearing loss once they did the hearing tests. So you just may not be noticing it yet and you may actually already have some hearing loss.