

# Handout



It's a Noisy Planet. Protect Their Hearing.

April 21, 2010

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Other Communication Disorders



Sponsored by NIH Child Care Board &  
Office of Research Services Division of Amenities and Transportation Services

The National Institute on Deafness and Other Communication Disorders

Welcome!

**It's A Noisy Planet**

PROTECT THEIR HEARING



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What is sound?

- Sound is a form of energy, just like electricity and light.
- Sound is made when air molecules vibrate and move in a pattern called waves, or sound waves.



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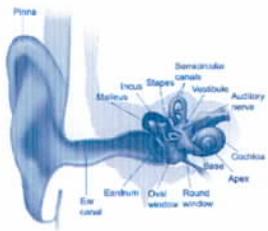
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How do we hear?



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**How do we damage our hearing?**

- Noise-induced hearing loss, NIHL, occurs when tiny sensory hair cells in the inner ear are damaged by noises that are too loud and last for too long.
- Impulse sound can result in immediate hearing loss that may be permanent.
- NIHL is irreversible, but is 100 percent preventable.



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**How is sound measure?**

- Sound is measured in decibels, dB.
- An increase of 10 means that a sound is 10 times more intense or powerful. To your ears, it sounds twice as loud.



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**How loud is too loud?**

- Long or repeated exposure to sounds at or above 85 decibels can cause hearing loss.
- The louder the sound, the shorter the time before damage can occur. How close you are to the source of noise also matters.



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**What can be done?**

- Block the noise (wear earplugs or earmuffs).
- Avoid the noise (walk away).
- Turn down the sound.



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**Teaching tweens about hearing protection**

- Children ages 8 to 12, or tweens, are becoming more independent and spending more time without direct adult supervision.
- Tweens ask for a greater say in their activities, music, and clothes.
- Most important, tweens continue to develop their own attitudes about their health.



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**Noise: Keep it down at home**

- You can create a quiet home by:
- Reduce noises at the source.
  - Avoid competing noises in the same area.
  - Make your family aware of noise sources, noise levels, and how to avoid unsafe noise levels.



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### Teachable moments

- You can use any spontaneous or unplanned event as a learning opportunity.
- Teachable moments are particularly effective because they give real-world meaning to the lesson you want to share.
- Let your tweens see you protecting your hearing and they will be more likely to protect their own.



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### Hearing protection

- Just as you want your child to wear sunscreen, use a seatbelt, and wear a bicycle helmet, you will want him or her to wear hearing protectors against excessive noise.
- Hearing protectors work by reducing the level of sound that reaches hair cells in our inner ear. They do not block out all noise, but just make all noises sound softer.



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### What types of hearing protectors are available?

- Earplugs are soft foam or harder plastic inserts that fit directly into the ear canal.
  - Expandable foam
  - Premolded earplugs
- Earmuffs look like wireless headphones.



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Contact Us

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## Teachable Moments about Healthy Hearing

A teachable moment offers a great opportunity to help your tween learn what to do to protect his or her hearing from noise-induced hearing loss (NIHL). You can use any spontaneous or unplanned event as a learning opportunity. In these moments, your child is suddenly open to learning new ideas. Teachable moments are particularly effective because they give real-world meaning to the lesson you want to share. For example, it's much easier for a child to understand that noise can damage his or her hearing after an ambulance, with its siren screaming, has passed by.

### What are some teachable moments about healthy hearing?

A teachable moment can occur almost anywhere—in your home, at school events, and during work and leisure time activities. Any time you are exposed to potentially damaging noise levels and you take action to protect your tween's hearing is a teachable moment. When you are mowing the lawn or doing carpentry, wear hearing protectors. When you are motorboating, hunting, or at a sports event, wear earplugs or earmuffs. Children often learn healthy behaviors by following the example of others. Let your tween see you protecting your hearing and he will be more likely to protect his own.

Other examples of teachable moments are:

- **When listening is enjoyable.** At almost any time of day and almost any place, you can share the pleasure of healthy hearing with your tween. If your child comments on a bird singing or a favorite band playing, this is a teachable moment. Talk with your tween about sounds in her environment and why healthy hearing is important.
- **When listening may *not* be enjoyable.** A good time to discuss why hearing needs to be protected—and how—is when the noise around you is too loud. A few examples of noisy situations are:
  - Waiting for a subway.
  - Walking by a road with heavy traffic or construction.
  - Doing yard work or housework involving noisy appliances.
  - Attending a sports event or concert.
  - Watching a parade.



## Teachable Moments about Healthy Hearing

In these and other noisy situations, help your child remember three ways to protect his or her hearing:

- Block the noise (wear hearing protectors, such as earplugs or earmuffs).
- Avoid the noise (walk away).
- Turn down the sound.

- **When noise is in the news.** NIHL has received increasing attention in the news. Hearing protectors have also been featured in news stories, such as when celebrities or their children wear earmuffs to protect their hearing while attending a concert. A photo of any professional wearing hearing protectors, including musicians, race car drivers, and construction workers, can be part of a teachable moment. Some news articles discuss the loudness of certain sounds, such as a whale's song or the noise levels in restaurants. Point out news articles involving sound and hearing to your tween. For stories of noises in the news, visit the Noisy Planet Web site.
- **When buying noisy toys and musical instruments.** Battery-operated toys, video games, and band instruments can create a lot of noise. When buying these items, discuss ways to limit your child's exposure to dangerous noise levels. For example, some toys allow you to turn the sound off or to lower the volume. At the music store, look for earplugs that musicians use to protect their hearing.
- **When your tween makes a healthy hearing choice.** Is your child listening to the television at a reasonable level? Has she put on earmuffs to mow the lawn? Has he put in earplugs to practice his trumpet? Be alert to opportunities to praise your child for healthy hearing behaviors.



The National Institute on Deafness and Other Communication Disorders (NIDCD) sponsors *It's a Noisy Planet. Protect Their Hearing*. This national public education campaign is designed to increase awareness among parents of children ages 8 to 12 (tweens) about the causes and prevention of noise-induced hearing loss (NIHL). With this information, parents and other adults can encourage children to adopt healthy hearing habits before and during the time that they develop listening, leisure, and working habits. To find out more about how to protect your hearing and that of your family, visit the Noisy Planet Web site at <http://www.noisyplanet.nidcd.nih.gov>.

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**NIH Publication No. 09-6431A  
October 2009**



## Noise: Keeping It Down at Home

Help protect your tween's hearing for a lifetime. Teach him or her about the sources of excessive noise in and around your house that can lead to noise-induced hearing loss (NIHL), and how to help keep it down.

Every day, we hear a variety of sounds in our homes. These sounds range from the gentle hum of a refrigerator to a blaring fire engine passing by. Most household sounds are at safe noise levels. Sometimes, however, we operate several noisy devices at the same time or raise the volume on the television so that we can hear it over the vacuum cleaner. When we take these actions, we raise the overall noise level in our homes without even realizing it.

Noises in our homes can reach a level that is uncomfortable or even harmful to our hearing. Some common devices, such as power lawn mowers, are noisy enough that hearing protectors are recommended for even short exposures. Make your home a peaceful place. The result will be good for your hearing and your health!

### What noise levels cause NIHL?

Sound is measured in units called decibels. The softest sound that healthy ears can hear is 0 decibels—near total silence. By comparison, a whisper measures 30 decibels, and normal conversation measures 60 decibels. Prolonged exposure to noises that are at or above 85 decibels can damage tiny sensory hair cells in our inner ears, causing NIHL.

NIHL occurs when our hearing is exposed for too long to sounds that are too loud. The higher the decibel level, the shorter the time before damage may occur. How close we are to the sound also matters. Sounds get louder as we move closer to the source and softer as we move away. Limiting the number of noise sources in operation at any one time, particularly when you and family members are nearby, will help maintain a safe and comfortable noise level.

For more information on safe and unsafe noise levels, read the fact sheet *How Loud Is Too Loud? How Long Is Too Long?* at <http://www.noisyplanet.nidcd.nih.gov/info/howloud.htm>.

### Tips for creating a quiet home

You can create a quiet home in three ways:

1. Reduce noises at the source.
2. Avoid competing noises in the same area.



## Noise: Keeping It Down at Home

3. Make your family aware of noise sources, noise levels, and how to avoid unsafe noise levels.

Here are some practical tips for creating a quiet home:

- Set your television, video games, and music to the lowest volume at which they can be heard clearly.
- If someone in the room has trouble hearing, consider turning on your television captioning rather than turning up the volume.
- Create ways to muffle the noise of chores. An example is to close the door between family members and appliances in use, such as those in a workshop or laundry room.
- Buy quiet toys. If you buy electronic toys, choose those with volume controls, and use only the lowest volume setting. This will both lower your household noise levels and help protect your child from NIHL.
- When buying certain appliances, such as a fan, range hood, or dishwasher, ask about its noise rating. Some ratings are given in "sones": the lower the sone number, the quieter the unit.
- If your home is in a particularly noisy location, work to keep outdoor noises outdoors. Caulk cracks around windows and doors. Insert putty or expanding foam around pipes and wires where they enter the house.
- Close windows and doors against potentially harmful sounds, such as leaf blowers, lawn mowers, power tools, and sirens.
- Use soft furnishings to soften noise indoors. The more cushions, curtains, and wall coverings you have, the more noise will be absorbed.
- Place carpets and area rugs over hard flooring to help soak up sound. Thicker rugs are more effective at reducing noises that bounce off of hard surfaces.

By taking just a few simple steps, you can achieve a home that is filled with only safe, peaceful sounds.

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## Teaching Tweens about Hearing Protectors

Children ages 8 to 12, or tweens, are becoming more independent and spending more time without direct adult supervision. They also ask for a greater say in their activities, music, and clothes. Most important, tweens continue to develop their own attitudes about their health. Parents and other adults can encourage tweens to adopt healthy habits that will help them protect their hearing for life.

Just as you want your child to wear sunscreen, use a seatbelt, and wear a bicycle helmet, you will want him or her to wear hearing protectors against excessive noise. Here are some suggestions for teaching tweens about hearing protectors so that they reach for earplugs or earmuffs as readily as they do for other protective gear.

- **Set clear rules for when hearing protectors should be worn.** Tell your child that you expect him or her to wear hearing protectors in noisy environments, even when you aren't there to supervise. For example, is it time to mow the lawn or is your child going riding on a dirt bike? It's time for your child to put on hearing protectors.
- **Be a good role model.** When you are mowing the lawn, using a leaf blower, or working with power tools, wear hearing protectors. Consider doing the same at sporting events, amusement parks, arcades, and other noisy places.
- **Teach your tween how excessive noise over time can cause noise-induced hearing loss (NIHL).** Visit the TweenZone on the Noisy Planet Web site at <http://www.noisyplanet.nidcd.nih.gov/tweens> to help your child understand the causes and prevention of NIHL.
- **Teach your child about noise levels.** Point out sources of excessive noise, like the siren of a passing fire truck or ambulance. Guess the decibel level, and look it up when you get home. For a list of decibel levels of common sounds, go to the Noisy Planet bookmark at <http://www.noisyplanet.nidcd.nih.gov/staticresources/materials/SoundRulerPrint.pdf>.
- **Think about buying a small decibel meter from an electronics store and carrying it with you.** Or you can download a decibel meter application to some cell phones. You might be surprised to learn the noise levels of public areas or restaurants. In this way, your child will become more aware of excessive noise, where it occurs, and when hearing protectors may be needed.



## Teaching Tweens about Hearing Protectors

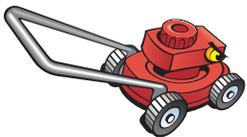


- **Do some research with your tween about NIHL.** You and your child may be surprised to learn that some favorite celebrities have hearing loss or a ringing in the ears—called tinnitus—from excessive noise. Some rock and hip hop musicians are encouraging their fans to listen to music at safe volumes and to wear hearing protectors. The Web site for Hearing Education and Awareness for Rockers, or H.E.A.R. (<http://www.hearnet.com>), has more information about protecting the hearing of musicians and music lovers. If friends make jokes about wearing earplugs or earmuffs, your kid can say, "If (name of musician) wears them, there must be a good reason."



- **Take your tween shopping for hearing protectors, either online or in stores.** Discuss with your child whether he or she would rather wear earplugs that can be hidden by hair or a hat or make a fashion statement with more noticeable hearing protectors. There are many fashionable, colorful, and comfortable styles of hearing protectors available.

- **Choose hearing protectors that fit in with your tween's daily activities.** Add earplugs or earmuffs to your shopping cart when you are outfitting your child for sports or band. Special musicians' earplugs are available so that your child can play an instrument loudly and clearly, but hear the music at a softer level. There are also hearing protectors designed specifically for hunting or shooting sports. Hearing protectors are available from many pharmacies, sporting good stores, hardware stores, and online companies.



- **Learn more about opportunities to discuss hearing protection with your tween.** You can find new ideas in the parent tip sheet *Teachable Moments about Healthy Hearing* at <http://www.noisyplanet.nidcd.nih.gov/parents/moments>.

When hearing protectors aren't an option, other ways to protect your hearing are to turn down the sound or to avoid the noise by walking away. By teaching your tween about hearing protectors and why and when they are needed, you can empower your child to make smart decisions that can protect his or her hearing now and in the future.



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## Sound Advice on Hearing Protection for Young Ears

Noise-induced hearing loss (NIHL) occurs when tiny sensory cells in our inner ear, called hair cells, are damaged by sounds that are too loud and that last too long. How near we are to the source of the noise also matters. NIHL can be permanent—but it is preventable. You can help your tween enjoy healthy hearing for a lifetime by learning about hearing protectors and when to use them.

### When are hearing protectors recommended?

Hearing protectors are recommended whenever a person's hearing is exposed to noise levels that exceed a certain level and time. Scientists have set this level in the workplace at 85 decibels for exposures longer than eight continuous hours. The louder the sound, the shorter the time before damage can occur.

In practical terms, your child won't damage his or her hearing by temporarily cranking up the volume for a favorite song or by taking a short ride on the subway. On the other hand, your tween could potentially damage his or her hearing by listening to music at maximum volume for an extended period of time. The same is true when your tween participates in any activity that exceeds a safe noise level and listening time.

Your child should wear hearing protectors while using a lawn mower, operating many power tools, or riding a snowmobile or farm tractor. Hearing protectors may also be advisable when your tween attends certain events in stadiums, gymnasiums, amusement parks, auditoriums, and other entertainment venues. Auto races, sporting events, and music concerts of all types (e.g., symphonies and rock) can be too loud for long-term exposure without hearing protectors.

Hearing protectors are an absolute must if your tween hunts or takes part in shooting sports. The sound of a gunshot can reach the same level as a jet engine at takeoff. At this level, noise can damage your child's hearing immediately and permanently. Make hearing protectors part of your child's standard shooting-safety gear.

Children will often place their hands over their ears when things get too noisy. It won't protect their hearing, but it is a good sign that hearing protectors may be needed. Have hearing protectors handy for the times when the sound is too loud.



## Sound Advice on Hearing Protection for Young Ears

### How do hearing protectors work?

Hearing protectors work by reducing the level of sound that reaches hair cells in our inner ear. They do not block out all noise, but just make all noises sound softer.

Different hearing protectors offer different levels of protection, as shown by their Noise Reduction Rating, or NRR. The higher the NRR, the greater the protection they offer. If a hearing protector has an NRR of 22, it can reduce a potentially harmful noise by 22 decibels. So a 100-decibel noise will be reduced to a safe level of 78 decibels ( $100 - 22 = 78$ ). For more information on safe and dangerous noise levels, read the Noisy Planet fact sheet *How Loud Is Too Loud? How Long Is Too Long?* (<http://www.noisyplanet.nidcd.nih.gov/info/howloud.htm>).

### What types of hearing protectors are available?

Two types of hearing protectors are available: earplugs and earmuffs.

**Earplugs** are soft foam or harder plastic inserts that fit directly into the ear canal. Earplugs are cheaper than earmuffs, and come in both disposable and reusable types. Many types can be washed and used repeatedly. Earplugs also are easy to carry around in a purse or pocket, ready for use at any time. Some earplugs are available with a neck strap so that your child can keep them handy and not lose one if it falls out. Even if you buy earmuffs for you and your child, you also might want to have some spare earplugs on hand.

- *Expandable foam earplugs* are designed to be rolled into a thin cylinder that is inserted about halfway into the ear canal. Once inserted, the earplug reshapes itself to fill the canal snugly. The green box shows a three-step method for inserting expandable foam earplugs that was developed by the National Institute of Occupational Safety and Health (NIOSH).
- *Premolded earplugs* are made from plastic, rubber, or silicone. These earplugs have a tapered shape, similar to an ice cream cone. Earplug styles that are sold in different sizes are generally recommended for use by children, who will need a smaller size than that used by an adult. A proper-fitting earplug will seal your child's ear without being uncomfortable. To fit a premolded earplug, have your child reach over his or her head and pull up on one ear. Your child should use the other hand to insert the plug with a gentle rocking motion until it feels tight in the ear canal.

**Earmuffs** look like wireless headphones. The part that fits over the ear is often filled with fluid, foam, or both to make sure that the earmuff fits comfortably and closely. Earmuffs cost more than earplugs, but they are easier than earplugs for young children to put on correctly. You also won't have to worry about the earmuffs sliding out. However, children who wear glasses may find earmuffs uncomfortable. The earmuffs also may not seal properly over glasses.



# Sound Advice on Hearing Protection for Young Ears



Many manufacturers now make earplugs and earmuffs in sizes to fit children. To find a list of manufacturers on the Internet, type "hearing protectors for children" into your computer's search engine. Your local drug store and hardware store may carry hearing protectors. Check to make sure that the earplugs are not too large for your child's ears or that the earmuffs are not too loose for your child's head.

To get the best protection from your soft foam earplugs, remember to **roll**, **pull**, and **hold** when putting them in. Use clean hands to keep from getting dirt and germs into your ears!



1. **Roll** the earplug up into a small, thin "snake" with your fingers. You can use one or both hands.



2. **Pull** the top of your ear up and back with your opposite hand to straighten out your ear canal. The rolled-up earplug should slide right in.



3. **Hold** the earplug in with your finger. Count to 20 or 30 out loud while waiting for the plug to expand and fill the ear canal. Your voice will sound muffled when the plug has made a good seal.

Check the fit when you're all done. Most of the foam body of the earplug should be within the ear canal. Try cupping your hands tightly over your ears. If sounds are much more muffled with your hands in place, the earplug may not be sealing properly. Take the earplug out and try again.

Text credit: NIOSH

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