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New AAP policy, technical report offer advice on reducing harms from excessive noise exposures

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Noise often is considered merely annoying, but excessive exposure has adverse health effects and is a major, underrecognized public health issue.

An estimated 12.5% of children and adolescents ages 6-19 years may be at risk for permanent hearing damage from excessive exposure to noise.

New AAP reports highlight effects of excessive noise, especially in children and adolescents, and how pediatricians can help prevent potentially dangerous exposures.

The AAP policy statement and technical report *Preventing Excessive Noise Exposure in Infants, Children, and Adolescents*, from the Council on Environmental Health and Climate Change and Section on Otolaryngology-Head and Neck Surgery, are available at https://doi.org/10.1542/peds.2023-063752 and https://doi.org/10.1542/peds.2023-063753 and will be published in the November issue of *Pediatrics*.

In addition, a session titled “Noise 201 – More than Headphones!” will be presented from 2-3 p.m. EDT today at the AAP National Conference & Exhibition. It will review common noise sources and discuss ways to lessen exposures and effects.

Types of noise

Noise often is defined as “unwanted or objectionable sound.” There are three types: occupational, environmental and recreational.

Occupational noise is experienced in the workplace.

Environmental noise generally originates from human activities, often powered by fossil fuels. Outdoor sources include road traffic, railways, airplanes and airports, industrial sites, wind farms, leaf blowers and lawn mowers. Indoor sources include sleep machines, video games, toys, televisions and classrooms. Environmental noise has disproportionate effects on underserved communities.

Recreational noise sources include personal listening devices; restaurants; music at parties, dances and concerts; sports events; and recreational firearm use.

Effects on hearing

Noise above 70 decibels (dB) over prolonged periods may start to damage hearing. Noise above 120 dB, such as from a blast or fireworks, can cause immediate, irreversible harm.

Loud noise can damage hair cells of the inner ear's cochlea and/or auditory nerve, resulting in sensorineural hearing loss. Once permanently damaged, hair cells of the inner ear usually cannot be restored with medical treatment.

The louder the sound, the shorter the time needed to damage the inner ear. The longer the exposure, the greater the risk, especially if hearing protection is not used or if there is not enough time for ears to rest between exposures.

Occupational standards mandate measures to protect workers from excessive noise. Standards for allowable sound levels often are considered "safe" for others, including those with recreational exposures. Occupational noise limits, however, do not imply safety for children or adolescents.

Environmental noise is less likely to cause hearing loss compared to occupational and recreational noise but can trigger a physiologic stress response and interfere with sleep and conversation. Annoyance from noise decreases quality of life. Classroom noise affects aspects of learning such as memory, attention and reaction time.

Life trajectory of hearing loss

Infants and children may be more vulnerable to noise than adults because of developing cognition and less control over their environments. Exposures can begin right after birth. Babies in neonatal intensive care units experience noise from phones, ventilators, infusion pumps, monitors, incubators, alarms and air conditioners.

At home, infants may be exposed to "white noise" sleep machines. Toddlers play with loud toys, and older children and teens turn up the volume on music and videos, sometimes due to loud background noise.

Children with developmental differences, including those with autism spectrum disorder and attention-deficit/hyperactivity disorder, often exhibit increased noise sensitivity.

Hearing loss is the third most common chronic condition in U.S. adults, according to the Centers for Disease Control and Prevention. Early life noise exposure likely contributes to hearing loss in adulthood. Life spans are long, allowing for repeated and cumulative exposures.

Caring for hearing a lifelong endeavor

Noise-induced hearing loss is preventable. Pediatricians can:

- Discuss the use of personal listening devices during adolescent interviews or when examining ears.
- Become familiar with World Health Organization recommendations for safer listening.
- Discuss device use with younger children's caregivers when addressing screen time. A child should be able to hear when spoken to and take listening breaks.
- Recommend setting devices to lowest sound levels and using parental controls to lock settings.
- Recommend shielding children from impulse noise (e.g., firearms and explosives) whenever possible.
- Advise caregivers to avoid or leave excessively noisy venues such as sports events or fireworks displays, and to use protection such as protective earmuffs, even on infants. Earplugs can be considered if properly inserted but can pose a choking hazard to younger children.
- Discuss other measures such as sound meter apps and noise-canceling headphones.
- Counsel adolescents who work in noisy occupations or are engaged in shooting sports about the importance of hearing protection.

Many people accept noise exposure as "given" and don't realize it can be injurious to health. This is reminiscent of knowledge and perceptions about smoking and secondhand smoke more than half a century ago.

In addition to educating children and families, pediatricians can advocate for environmental noise-control measures and other public health legislation and regulations.

Dr. Balk is a lead author of the policy statement and technical report. She is a member of the AAP Council on Environmental Health and Climate Change Executive Committee.

Resources

- The policy statement includes recommendations for pediatricians, medical and other organizations, and government on reducing hazardous exposures to noise.
- Information for parents from HealthyChildren.org on how noise affects children
- Information from the World Health Organization on children and noise