

Protecting The Professional Ear: Conservation Strategies And Devices

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It is well known that exposure to high-intensity levels of sound may cause irreversible damage to the inner ear and result in permanent hearing impairment.^{1,2} Exposure to diverse sources of excessive sound energy, such as machinery, heavy equipment, power tools, engines, gunfire, and fireworks, can occur in a variety of settings, ranging from the industrial workplace to the military, from the home to recreational settings.

Musicians and other music industry personnel are regularly exposed to potentially damaging sound levels. The risk to hearing posed by loud music crosses genres, from rock and roll, to country, to classical music. In contrast to the factory worker, the tradesman, or the hunter, the professional musician is extremely reliant on hearing integrity for his or her livelihood. Yet, historically, hearing conservation efforts have rarely been implemented, or even considered, in the music industry.

Recently, we have noticed increased interest in hearing and hearing protection among performers and technical personnel in the music industry. We have also witnessed the development of two new strategies for controlling the intensity level of music without reducing its quality, as well as one very sensitive technique for early detection of sound-related auditory dysfunction.

SOUND EXPOSURE IN THE MUSIC INDUSTRY

Protecting the professional ear might appear rather straightforward in comparison to industrial hearing conservation. Music industry personnel understand the technical and artistic components of sound and music. Terms, such as decibels, frequency response, sound-level meter, distortion, attenuation, and amplification are in their everyday vocabulary. Also, performers and technical personnel have a high appreciation for hearing. Although their understanding of the auditory system and the pathophysiology of overexposure to sound may be minimal, musicians can invariably describe the symptoms quite graphically.

But, in reality, protecting the professional ear is extremely challenging for at least a dozen reasons.

- First, musicians are exposed to high-intensity sounds in a variety of settings and venues, ranging from a studio, to a small club, to a large auditorium. Therefore hearing con-

servation for the musician must be implemented in multiple sites.

- Second, a musician may perform types of music that differ dramatically in intensity. When sound levels are moderate, little

or no attenuation is required; yet, moments later, considerable attenuation may be indicated.

- Even when performers understand and desire the benefits of limiting the intensity of their music, other factors, such as the expectations and demands of the audience, may prevail.

- Musicians may be exposed to high levels of sound for extended periods of time each day both as participants in recording sessions, rehearsals, and performances, and also as listeners to other performers.

- The risk of music-induced hearing loss may differ dramatically among subtypes of performers, in part because of their usual location on stage. For example, a drummer's left ear is at greater risk because the snare drum and high hat are on the left side. The left ear of violinists (or fiddlers) is also at greater risk because of where they hold their instrument. Symphony musicians may be chronically exposed to high sound levels on either the right or left side depending on their location relative to certain instruments (e.g., the percussion or brass sections).

- Vocalists may prefer not to wear ear protection because they fear they will be unable to monitor their voice.

- Most musicians have the equipment to do frequency-specific amplification. Thus, a sound engineer may try to compensate for a high-frequency hearing loss by increasing the output of earphones or stage monitors in the region of the loss.

- There are no established "damage risk criteria" for music exposure, as there are for industrial noise exposure (U.S. Occupational Safety and Health Administration standards).

- Ear protection may not fit the image of some musicians.

- Many musicians who are well aware of their hearing loss may avoid audiologic assessment out of denial or to avoid the risk that their hearing loss—a professional handicap—become known.

- Even if musicians *do* seek help from a hearing care professional, their hearing loss may go undetected if they are given only a simple hearing screening.

