Your Dog Will Never Hear Mahler’s Symphony No.2 ‘Resurrection’

Hearing loss can be a serious issue for performing musicians of all genres. In response to the 2009 Body and Bass survey, ‘A Survey of, for and about Bassists’, a number of experienced bassists mentioned hearing problems due to performance situations. ISB General Manager Madeleine Crouch introduced me to Kathy Peck, who I invited to contribute to this issue’s Body and Bass column. Kathy’s personal experience, her passion for educating musicians about the dangers of hearing loss, and her help and guidance for musicians experiencing hearing problems are inspirational. Please join me in welcoming Kathy Peck, bassist, hearing specialist and founder of H.E.A.R.® (Hearing Education and Awareness for Rockers). May you benefit from her insight and knowledge — ENJOY!

By Kathy Peck

One reason we hear melody when animals do not is that our brains are able to manipulate patterns of sound far more complex than those in the brain of any other animal. Animals hear only in sequences, not to relationships between notes. They hear only random sound patterns. Human ears are not only able to hear but to discern vibrating sound waves. In music, these are instantly conveyed into pattern after pattern of meaningful sound as our brain assembles a web of tonal relationships into music.

Yet we sometimes take this amazing gift of hearing for granted. As a fellow bass player, I unknowingly did just that, unaware of the huge consequences I would suffer. My all-girl rock band ‘The Contractions’ opened for Duran Duran at Oakland Coliseum during their MTV video-shoot concert tour in the 80s. For that particular show I felt that our rock trio needed to have more power, so I borrowed a friend’s giant bass cabinet stack, prepared to pump out a wall of sound at the concert. Little did I know that was the day my whole world would turn upside-down and my hearing damage would become permanent. It was this experience than led me to become a founder of the H.E.A.R.® (Hearing Education and Awareness for Rockers) non-profit foundation.

The ear is not designed for repeated exposure to extremely high sound levels. Its defense mechanism is limited. A middle ear reflex action (a contraction of ear muscles that stiffens the system, reducing energy transmission) can protect against sudden increases in sound, but too slowly however, to protect against bursts of sounds such as gunshots, loud drum hits or walls of sound intensity that assault our ears and hit us in the chest.

A sound wave travels through the air at around 1100 feet per second. It vibrates at different rates, which is the frequency of a wave. We hear higher frequency of a wave as higher pitch. When there are fewer fluctuations in a period of time, the pitch is lower. Sound Pressure Level (SPL) is a measurement of the air pressure of a wave’s amplitude and how it affects the speed of sound. It determines the volume of sound and is measured in decibels. Sound waves with greater amplitudes move our eardrums more, and we register this sensation as higher volume. No matter what the sound frequency, high or low, it is the sound intensity or loudness combined with the repetition of exposure that can harm the ears.

Think of your ears as if they were tiny organic batteries with a charge. The more exposure of the ears to loud noise or music, the more the ears will lose their charge. So if you are over your maximum daily dose of loud sounds, your ears begin to lose their charge. This is why people hear less
clearly and/or have ringing in their ears after being exposed to music at a loud concert or to other loud noises. Even worse, people who suffer with tinnitus (ringing in the ears) may hear just one specific tone that will set off the ringing in their ears. For some, even when things are completely quiet and there is no sound in their environment at all, ears may start to ring.

Exposure to continuous loud sounds can sometimes cause a temporary hearing loss (temporary threshold shift), and the ears may recover in a day or so. However, repeated exposure to harmful sounds eventually diminishes the ability of the sensory hair cells in our inner ear to transmit sound by flattening or disfiguring them, fusing them together or breaking them off entirely. Sounds louder than 80 decibels are considered potentially hazardous. OSHA guidelines are 90 dB for factories. Audiologists would like to see that changed to 85 dB for 8 hours of noise exposure for unprotected ears. Unlike noise exposure from factories or machinery, loud music exposure is not regulated and there are no required guidelines.

**The good news is that hearing loss is preventable if caught in time.**

The risk of damaging your hearing depends on a number of factors including: 1) the intensity of the sounds and/or the loudness of the music or noise; 2) how close you are to the loud sound source; 3) how long you are exposed to loud music or noise; 4) other noisy activity exposure that day, including how loudly you listen to your iPod; 5) previous hearing damage; 6) your health condition at the time (alcohol & dehydration makes things worse); 7) family history of hearing loss; 8) drugs that may be ototoxic (toxic to the ears).

**What are warning signs of hearing damage?**

Warning signs of hearing damage include: 1) ringing in the ears (tinnitus); 2) sensitivity to loud noises; 3) difficulty hearing others speak when there is background noise; 4) people sounding as if they are mumbling or speaking too quickly; 5) having to ask people to repeat what they have said; 6) needing to turn up the volume on a stereo, TV or iPod; 7) hearing a sound such as the ringing of a telephone, better with one ear than the other. If you have any of these symptoms, it is important to get your hearing checked by a health professional specializing in the ear such as an ear doctor or an audiologist.

**Are You at Risk?**

The incidence of hearing loss in classical musicians has been estimated at 4-43%. In rock musicians, this figure is 13-30%. High frequency sounds of 2-4,000 Hz are the most damaging. For reference, the highest octave of the piccolo registers 2,048-4,096 Hz.

The following chart shows the maximum allowable exposure time at certain decibels before there is a risk for hearing damage to unprotected ears:

<table>
<thead>
<tr>
<th>dB level</th>
<th>16 hours</th>
<th>8 hours</th>
<th>4 hours</th>
<th>2 hours</th>
<th>1 hour</th>
<th>30 minutes</th>
<th>15 minutes</th>
<th>7.5 minutes</th>
<th>3.75 minutes</th>
<th>1.875 minutes</th>
<th>.9375 minutes</th>
<th>.46875 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>82 dB</td>
<td>85 dB</td>
<td>88 dB</td>
<td>91 dB</td>
<td>94 dB</td>
<td>97 dB</td>
<td>100 dB</td>
<td>103 dB</td>
<td>106 dB</td>
<td>109 dB</td>
<td>112 dB</td>
<td>115 dB</td>
</tr>
</tbody>
</table>

Regular sustained exposure may cause permanent damage at 90-95 dB. Physical pain can begin at 125 dB. Everyday environmental noise, including conversation, telephone dial tones, city traffic, subway trains and power tools ranges from 60-125 dB. Musical noise, including the volume of individual instruments ranges from 60-150 dB. Jet engines at 100 feet register 140 dB.
What can you do to minimize the potential for hearing loss and/or prevent further damage?

It is important to not overexpose your ears. This can be done by: 1) turn down the volume of your stereo, TV and iPod; 2) monitor sound levels at your rehearsals and performances; 3) limit your exposure time; 4) Take a 5 – 15 minute break from the sound source; 5) WEAR EARPLUGS! As sunglasses are for protection of the eyes, hearing protection in loud, noisy environments is just as important for the ears. Every working musician and music listener should consider using hearing protection.

Development and availability of high-quality earplugs

When H.E.A.R.® began in 1988, there were few options for musicians to protect or enhance their hearing during performance. That has changed. H.E.A.R.® has had the privilege to work over the years with many great inventors of music hearing products such as Etymotic Research, commercial developer of Musicians Earplugs, Future Sonics, the inventor and commercial developer of the Ear Monitor system for live music performances, and other outstanding music-hearing protection and music-hearing enhancement in-ear monitor companies like Westone, Ultimate Ears, Shure, Sensaphonics, Mack’s HEAR Plugs, 3M and others.

In 1989, Pete Townshend of The Who came to the rescue of our fledgling 501c (3) organization. As a founding donor, Pete helped H.E.A.R.® launch what has become an international grassroots cause for hearing health for musicians and music fans. H.E.A.R.® now offers H.E.A.R.® Partners referrals to audiologists and ear doctors around the country who can help musicians with their hearing concerns. Visit www.hearnet.com for specialists in your area.

What options in earplugs are available?

Musicians Earplugs are the quality earpiece of choice for performing musicians. The Musician Earplug is a custom fit canal-style earplug that is virtually unnoticeable. The flat attenuation characteristics allow the wearer to hear...
accurately but at a safer volume. They can be ordered with a choice of either ER 9, 15, or 25 dB filters.

Ready-fit Mack’s HEAR Plugs are an easy way to protect the ears without sacrificing sound quality. The soft flanges enable maximum comfort, while the firm stem allows fast, easy insertion.

In-Ear Monitors (IEM) are available for audio engineers, touring artists and audiophiles for listening to live performances and for studio recording.

**H.E.A.R.’s how you can help us help others:**

Hearing conservation needs to be part of every music curriculum. Our new Listen Smart: Safely Handling the Power of Sound DVD program can help educate music educators and students. Please join our new facebook page http://www.causes.com/causes/187220-HearnetOfficial/actions/1231580 and help us spread the word. For more on music hearing education, H.E.A.R. provides Listen Smart™: Safely Handling The Power of Sound Rockumentary (15 minutes in length) produced by Dan Beck (H.A.M.E.F.) and directed by Pamela French. This Cine Golden Eagle award-winning Rockumentary is designed to create awareness about noise-induced hearing loss (NIHL) and encourage safer practices in consuming high decibel sound. It features a diverse group of recording artists, prominent audiologists, and medical experts all sharing their experiences, advice and views on the power of sound in their professional lives.

Visit http://www.hearnet.com/features/feature_Listen%20Smartindex.shtml to view a 3-minute Listen Smart movie trailer which features Lars Ulrich of Metallica, Ozzy Osbourne and Moby.

**About H.E.A.R.**

Based in San Francisco and celebrating over 25 years of service, H.E.A.R. (Hearing Education and Awareness for Rockers) was founded in 1988 as a nonprofit 501(c)(3) organization dedicated to the prevention of hearing loss and tinnitus among musicians, conductors, singers, sound engineers, music producers, other music industry personnel, music students and all music fans through grassroots advocacy and education outreach. With the support from the music and medical industries, foundations and individual donors, H.E.A.R. is helping to raise awareness of the real dangers of repeated exposure to excessive sound levels from music and noise. Your Ears Are Your Most Important Musical Instrument™.

Visit www.hearnet.com for more information.

Thank you! ~ Kathy

**Credits:**

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