Hearing Loss Prevention for Musicians – moderation, ear plugs, and humming.

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Hearing loss is a gradual process that may not be noticed for years. And when it does happen, people generally notice that speech is mumbled and unclear. People may report a ringing (or tinnitus) in their ears. By that time, it may be too late. Prevention of hearing loss is where its at! There are many different causes of hearing loss but the most common preventable one is from noise or music exposure. As far as the human ear is concerned, there really is no difference between exposure from loud music and exposure to a construction site. Loud noise (or loud music) results in large amplitude sound vibrations in the air. These are transmitted down the ear canal to the middle ear (the part of the ear where kids get many infections), and onto the inner ear. The inner ear (also known as the cochlea) is a spiral shaped organ about the size of one's small finger nail- packed with 13,000 to 15,000 nerve endings, called hair cells. These hair cells vibrate in synchrony with the external sound and music and transmit the sound up to the brain. A breakdown of any of these locations en route to the brain will result in a hearing loss. As it turns out, most problems with the outer and middle ears are treatable and as such, are temporary. However, damage to the hair cells of the inner ear are permanent. There is no surgery, or medication that can resolve an inner ear hearing loss. And music exposure (like construction or

factory noise exposure) results in a damage to the inner ear: resulting in a permanent hearing loss.

There are many sources of noise in the music industry- explosions, loud cymbal crashes, feedback from speakers, and the routine noise and music of a busy life. Yet, even quiet noises, if one listens to them long enough, can damage one's hearing. A dial tone on a telephone, if listened to long enough, can cause a permanent hearing loss. Its not just rock music- it can be your Walkman (for those of us over 50), an ipod, or even a symphony! A permanent hearing loss can be the result of a single loud blast, but more often its the result of years of exposure to sounds that one would not normally think of as damaging.

Ontario has just introduced through its Ministry of Labour, a new noise regulation. This will also affect the content of the Performing Arts Guidelines that were published in 1993. Prior to July 1, 2007 the noise regulations in Ontario mandated "noise controls" if the noise (or music) level was over 90 decibels (dB). The new regulations specify that noise controls need to be implemented if the noise (or music) level is over 85 dB- about the loudness of a dial tone. Symphonies, even during very quiet pieces, generally play well over 85 dB. However, 85 dB or even 95 dB is not damaging, as long as one does not listen, or play, for hours on end. The new Ontario noise regulations also include a formula to balance the intensity of the noise with the number of hours exposed. This is called the 3 dB exchange rate. Simply stated, this says that for each 3 dB increase in intensity, the damage is doubled. This means that 85 dB for 40 hours each week is indentical in damage to 88 dB for only 20 hours each week,…, and 100 dB for only an hour and a quarter. There is nothing wrong with listening or playing loud music for an hour or two, but be

sure to give your ears a rest. This brings us to our first hearing loss prevention strategy- moderation.

• Permanent hearing loss starts as a series of temporary hearing losses. When you come out of a rock concert or other loud venue, your hearing may temporarily be decreased. You might notice this as a muffled feeling and may notice ringing or tinnitus. This temporary hearing loss resolves after about 16-18 hours. Eventually it may become permanent. The strategy would therefore involve moderation. If you see a loud rock group on Friday night, don't mow your lawn on Saturday. Wait until Sunday, or better still get someone else to do it! If you are listening to your MP3 player and your favourite song comes on, turn up the volume and enjoy it- just turn it down to a more moderate level after.

• Another strategy involves hearing protection: Conventional hearing protection has historically not been well received by those in the performing arts and by music listeners. This form of "industrial strength" earplug usually causes the wearer to hear speech as if was muffled and unclear. In addition, frequently one's own voice sounds hollow and echoey. A solution is a tuned earplug called the ER-15 and it treats all sound identically- the low bass notes, the mid-range, and the higher treble notes are all lessened or attenuated by the same 15 decibels. With this earplug, speech is clear and there is significant reduction of the potential for hearing loss from loud sounds. While wearing the ER-15 earplug, one can be exposed 32 times as long before the same damage occurs, as without hearing protection. People who wear the ER-15 frequently forget that they are actually wearing hearing protection.

• The third strategy is to hum while you work: Humans (and all other mammals) have a small muscle in their middle ears that contract upon loud sounds. From an evolutionary perspective, we have such a muscle so that our own voice would not be too loud for us. When this muscle (called the stapedius muscle) contracts, it pulls on the chain of bones in the middle ear that conduct sounds, making them less efficient as conductors. Sound from the environment therefore cannot get through to our ears as readily, thus providing us with significant protection. If you know that a loud sound or blast is about to occur, start humming before the blast and continue until the blast is finished. Drummers have known this for years without being told. You may have noticed that many drummers talk to themselves, and this is actually a good thing (at least for hearing loss prevention!)