Guitar and Rock/Blues Vocalists

Guitar players and Rock/Blues vocalists share a similar part of the stage and as such, are similarly exposed to loud music. Some of the strategies to reduce the potential for music related hearing loss are also similar.

• Earmonitors are small in-the-ear devices that look like hearing aids connected to small wire cables. These can be plugged directly into the amplification system. These not only afford some protection from overly loud music, but allow the guitar players and vocalists to monitor their music better. Frequently, the overall sound levels on stage during rehearsals and performances are quieter while using these monitors. In the case of vocalists, the use of ear monitors will allow them to hear their voice better with an added benefit of reduced vocal strain after a long set. Earmonitors can be designed to either improve monitoring or function as ear protection, or both. Depending on the type of music, one's style, and one's position in the band, a trade-off between these goals may be necessary.

• Loudspeakers generate a wide range of sounds. Like the bell of a trumpet however, not all sounds come directly out of the speaker. Low-frequency bass notes can be just as loud beside the loudspeaker enclosure as directly in front, whereas higher frequency sounds emanate much like a laser beam. Tilting or aiming the loudspeaker up to the musicians' ear will ensure that the music has a "flatter" response. The overall level will tend to be lower on stage because the sound engineer will not need to compensate for a "peaky" response. Some researchers recommend elevating loudspeakers to ear level for much the same reason. Indeed this can be useful, but this will depend on the design of the loudspeaker. Checking with the manufacturer will provide information on whether this is the best choice of orientation for that specific loudspeaker.

• The loudspeakers can also be used as an acoustic shadow to hide in. High-frequency sounds tend to emanate from the loudspeakers in almost a straight line. Since these same high-frequency treble notes can also be the most intense, standing beside the loudspeaker enclosure (instead of in front or behind it) may afford some protection.

• The main source of potential damage appears to be from the drummer's high-hat cymbal, typically on the left side of the drummer. Moving away from the high hat cymbal as much as is reasonable, or the use of lucite or plexiglas baffles between the cymbals and the other musicians may be useful to minimize the potential damage to one's hearing. If baffles are used, it is important to ensure that they do not extend above the level of the drummer's ear, since high-frequency reflections can exacerbate the drummer's hearing.

• There are now custom-made, tuned earplugs that many instrumental musicians and vocalists are using, called the ER-15 earplugs. These allow all of the music to be attenuated (lessened in energy) equally across the full range of musical sounds. That is, the low-bass notes are treated identically to the mid-range and high-frequency treble notes. The balance of music is therefore not altered. These have been in wide use since the late 1980s.

• The human ear is much like any other body part- too much use and it may be damaged. The ear takes about 16 hours to "reset". After attending a rock concert or a loud session, you may notice reduced hearing and/or tinnitus (ringing) in your ears. And if your hearing was assessed immediately after the concert, one would find a temporary hearing loss. After 16 hours however, your hearing should return to its "baseline" (hopefully normal) level. After a loud session or concert, refrain from practice for 16-18 hours. It’s a good excuse not to mow your lawn for a day or two!

Woodwinds and Large Stringed Instruments

Woodwinds such as clarinet, saxophone, oboe, bassoon, and the flute are all found in symphonies and smaller chamber groups. So are the larger stringed instruments such as cello, string bass, and the harp. These instruments generate similar sound levels (albeit at different frequencies), and are subject to similar music exposure from other instruments. Many of these musicians need to sit in front of potentially damaging trumpet and percussion sections.

• Most of these instruments possess significant low-frequency sound energy with very little fundamental and harmonic energy in the higher frequencies. And, these same musicians need to sit "downwind" of the brass section. Most of the damaging energy from the brass section is in the higher frequency ranges, so it would be ideal to have ear protection that lets through the lower frequency sounds, but attenuates (or lessens) the higher frequencies from the other instruments. Indeed such a "vented/tuned ear plug" is useful for these instruments. A tuned cavity is created in the ear plug that allows the musician to hear their own instrument while ensuring that the damaging elements of the trumpet and percussion sections are reduced.

• For those woodwinds (clarinet, saxophone, flute) that also play in jazz and blues bands, a wider form of protection can be useful. These are called the ER-15 earplugs. They allow all of the music to be attenuated (lessened in energy) equally across the full range of musical sounds. That is, the low-bass notes are treated identically to the mid-range and high-frequency treble notes. The balance of music is therefore not altered. These earplugs have been in wide use since the late 1980s.

• Plexiglas™ baffles can be erected between the cymbals and the jazz/blues woodwind players, but should not extend higher than the drummer's ear. Such baffles can attenuate the sound energy of the drums for the other musicians. Ensuring that the baffles do not extend too high ensures that the drummer is not subject to their own high-frequency reflections, which may increase the potential for future hearing loss.

• Earmonitors are small in-the-ear devices that look like hearing aids connected to small wire cables. They can be connected directly to the amplification system. These not only afford some protection from overly loud music, but allow the woodwind players to monitor their music better. Generally however, these are not necessary unless the music levels are very intense. Frequently, the overall sound levels on stage during rehearsals and performances are quieter while using these ear monitors.

• Acoustic monitors are stethoscope-like devices that can be used by acoustic bass, cello and harp players to allow them to better hear their own instrument. A length of hearing aid tubing plugs into one's custom made earplug on one end and by way of a suction cup or similar attachment, it plugs onto the tail piece, bridge, or body of the bass, cello, or harp. The musician can improve the monitoring of their own instrument which has the benefit of not overplaying. Wrist and arm strain is usually reduced with such a set-up.

• The human ear is much like any other body part- too much use and it may be damaged. The ear takes about 16 hours to "reset". After attending a rock concert or a loud session you may notice reduced hearing and/or tinnitus (ringing) in your ears. And if your hearing was assessed immediately after the concert, one would find a temporary hearing loss. After 16 hours however, your hearing should return to its "baseline" (hopefully normal) level. After a loud session or concert, don't practice for 16-18 hours. Its a good excuse not to mow your lawn for a day or two!

Bass Players and Drummers

Even though it may be surprising to group bass players and drummers together, because of the similar location in a band, the types of noise exposure can be similar. In some cases, the environmental strategies to minimize the potential from hearing loss are also similar.

• Humming just prior to, and through a loud sound such as a cymbal crash or rim shot, may afford some hearing protection. There is a small muscle in our middle ears that contracts upon the sensation of loud sounds. This contraction pulls on the bones of the middle ear, thus temporarily making it harder for sound to be transmitted through to one's inner ear. Mother Nature designed us with this, so that our own voice would not be perceived as too loud. If one knows about an imminent loud sound such as a cymbal crash, hum just before the crash and sustain the hum through the sound.

• Shakers are small, hockey puck sized speakers that can be wired into the main amplification system. These shakers can be bolted under a drummer's seat, or screwed onto a 1 square foot piece of 3/4" plywood board placed on the floor near the bass player or drummer. The musicians feel they are playing slightly louder than they actually are. The musicians and their ears benefit.

• Plexiglas™ baffles can be erected between the cymbals and the bass players, but should not extend higher than the drummer's ear. Such baffles can attenuate (lessen) the sound energy of the drums for the other musicians. Ensuring that the baffles do not extend too high ensures that the drummer is not subject to his own high-frequency reflections, which may increase the potential for future hearing loss.

• Ear monitors are small in-the-ear devices that look like hearing aids connected to small wire cables. They can be plugged directly into to the amplification system. These not only afford some protection from overly loud music, but allow the bass players and drummers to monitor their music better. Frequently, the overall sound levels on stage during rehearsals and performances are quieter while using these monitors.

• Acoustic monitors are stethoscope-like devices that can be used by acoustic bass and cello players to allow them to better hear their own instrument. A length of thin hearing aid tubing plugs into one's custom made earplug on one end and by way of a suction cup or similar attachment, it plugs onto the tail piece, bridge, or body of the bass. The bass musician can better monitor their own instrument which has the benefit of not overplaying. Wrist and arm strain is usually reduced with such a set-up.

• Drummers should be using the ER-25 earplugs. Too much ear protection can and does result in arm and wrist strain (due to overplaying) and not enough protection can result in continued hearing loss. The ER-25 (like its more mild form, the ER-15) is a uniform or flat ear protector such that the bass notes, the mid-range notes and the high-frequency notes are all attenuated equally. The balance of music is not altered.

• The human ear is much like any other body part- too much use and it may be damaged. The ear takes about 16 hours to "reset". After attending a rock concert you may notice reduced hearing and/or tinnitus (ringing) in your ears. And if your hearing was assessed immediately after the concert, one would find a temporary hearing loss. After 16 hours however, your hearing should return to its "baseline" (hopefully normal) level. After a loud session or concert, don't practice for 16-18 hours. Also, it’s a good excuse not to mow your lawn for a day or two!

School Band Teachers

Several inexpensive modifications can be made to school classrooms and portables. Such venues may not be optimal for use as music rooms. These modifications can be accomplished without any special technical knowledge. In addition, other modifications can be made by acoustical engineers. While this second option may be costly, many of the recommendations made by acoustical engineers may yield dramatically improved acoustic environments.

• Trumpets and other treble brass instruments should be placed on risers. Most of the damaging energy of the trumpet is in the higher frequency ranges, and these high-frequency treble notes tend to emanate from the bell of the trumpet like a laser beam. That is, high-frequency damaging sounds will tend to go over the heads of those other musicians downwind. In addition, the trumpet players will not need to play as hard for their sound to be heard clearly. And by the time the trumpet sound reaches the conductor, the levels are not nearly as damaging as for those immediately in front of the trumpets.

• A highly reflective surface, such as a blackboard, behind the teacher/conductor is the worst possible wall covering. High-frequency sounds tend to reflect off such surfaces thereby adding to the overall intensity level in the room. Moveable drapes or thick curtains can be hung over the blackboard (or concrete wall) to absorb these unwanted reflections. They can then be pulled aside when the blackboard is being used.

• Carpeting can be used at the front of the room where the conductor stands. Not only will this absorb some of the undesirable reflections, but will also allow the music teacher to stand for longer periods of time without backaches.

• 3-D relief art (from the Art Department) would make an excellent wall covering for the side walls of the music room. In this location, the art will not be visually distracting and at the same time absorb many of the undesirable mid- and high-frequency reflections.

• There are now custom made tuned earplugs that many musicians and music teachers are using called the ER-15 earplugs. These allow all of the music to be attenuated (lessened in energy) equally across the full range of musical sounds. That is, the low-bass notes are treated identically to the mid-range and high-frequency treble notes. The balance of music is therefore not altered. These earplugs have been in wide use since the late 1980s.

• The human ear is much like any other body part- too much use and it may be damaged. The ear takes about 16 hours to "reset". After attending a rock concert or a loud session at school you may notice reduced hearing and/or tinnitus (ringing) in your ears. And if your hearing was assessed immediately after the concert, one would find a temporary hearing loss. After 16 hours however, your hearing should return to its "baseline" (hopefully normal) level. After a loud session or concert, don't practice for 16-18 hours. Also, it’s a good excuse not to mow your lawn for a day or two!

Violins and Violas

Violins and violas can generate sufficiently loud levels of music such that they can cause permanent hearing loss. This is typically worse in the left ear (the ear nearer the instrument). In many cases, the violin or viola player is surrounded by many like instruments, such that the overall level in an orchestra in the violin and viola sections can be quite intense. Unlike most other instrument categories, the ability to hear the higher frequency harmonics is crucial to these musicians. Therefore recommendations are provided to protect hearing and to maintain audibility of the higher frequency harmonics.

• Violins and violas should always be played away from overhangs such as those commonly found in orchestral pits. The roofs of such overhangs frequently are treated acoustically in order to minimize reflections. It is not uncommon that the magnitude of the higher frequency harmonic components of these instruments are reduced by this acoustic treatment. Since players of violins and violas need to be aware of this high-frequency energy, the sound is muted. These musicians tend to play harder to compensate for this lost energy with an unnecessary increased sound level and a possible danger to their arms.

• There are any number of acoustic baffles that can be placed on the rear portion of a seat in an orchestra that can serve to reduce the loudness of the instruments to the rear. Depending on the manufacturer some are opaque and some are transparent. Baffles do work well and serve to attenuate (or lessen) higher frequency sounds more than bass sounds. However, these seat baffles only work if the baffle is within 7 inches of the musician's ear. If further away, because of reflections off the floor and music stands, the baffles have no significant effect.

• Like other instruments, violin and viola players can use mutes while practising, thus reducing the overall daily exposure to noise/music. These mutes can fit over the bridge and only result in a slight high-frequency loss of musical information.

• There are now custom-made, tuned earplugs that many violin and viola players are using called the ER-15 earplugs. These allow all of the music to be attenuated (lessened in energy) equally across the full range of musical sounds. That is, the low-bass notes are treated identically to the mid-range and high-frequency treble notes. The balance of music is therefore not altered. These earplugs have been in wide use since the late 1980s.

• The human ear is much like any other body part- too much use and it may be damaged. The ear takes about 16 hours to "reset". After attending a rock concert or a loud musical session you may notice reduced hearing and/or tinnitus (ringing) in your ears. And if your hearing was assessed immediately after such a concert or session, one would find a temporary hearing loss. After 16 hours however, your hearing should return to its "baseline" (hopefully normal) level. After a loud session or concert, don't practice for 16-18 hours. Also, it’s a good excuse not to mow your lawn for a day or two!