T K Group, Inc.

Newsletter
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Personal Music Listening Devices and Hearing Loss

Apple Corporation, manufacturer of the iPod portable music player, released a software update allowing users (and parents of users) to limit the device's volume output following a lawsuit filed by a consumer claiming that the device could potentially result in irreparable, permanent noise-induced hearing loss. France recently demanded that all iPod's be removed from marketplaces to install this software to limit output to 100 dB. (Editorial comment: France is in need of additional consultation because 100 dB is still too loud.)

iPods and similar platforms are no doubt popular. In fact, a recent survey conducted by Student Monitor (Ridgewood, NJ) reported iPod usage-not beer drinking, as the most popular activity among college undergraduates. Unfortunately, several sources report maximum iPod volume output levels of 115 dB, a level capable of inducing noise-induced hearing loss with short and infrequent usage.

Hearing loss professionals have long known of a direct correlation between exposure duration and hearing loss. Longer exposure durations increase the risk and severity of noise-induced damage; additionally, the nearer the noise source to the ear, the greater the risk and magnitude of damage. The latter is especially significant in personal listening devices since many such devices incorporate use of an "ear bud" allowing for deeper insertion of the speaker into the ear canal; this places the noise source in closer proximity to the ear.

Dr. Brian Fligor, an Audiologist at Boston Children's Hospital, has proposed the "60/60" Rule; the "60/60 Rule" recommends that iPod volume (or the volume of any other personal listening device) be set to 60% of the devices' maximum output capability. Dr. Fligor also suggests that usage be limited to 60

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News Shifts call for New Determinations

A frequent question posed to T K Group regarding Work Relatedness Determinations is: "Employee Jones sustained a potentially OSHA Recordable shift event two years ago, which was determined to be non-occupational (by an in-house professional, third party professional or current vendor). Employee Jones indicates a "new" Recordable shift event this year. *Is another Work Relatedness Determination recommended, although a previous non-occupational determination was made?*

Answer: If the determination option is exercised as permitted by OSHA,

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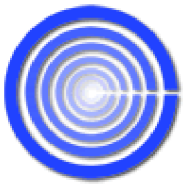
Inside:



Personal Music Listening Devices and Hearing Loss (continued)

minutes a day.

A study by the American Speech Language Hearing Association suggests that use of personal listening devices are contributing significantly to an alarming hearing loss trend in teen and even pre-teen users. Parents of such users are urged to obtain the iPod software release. The software allows volume limits in conjunction with password protection which to date prevents tampering of parental settings.

Hey, if your kids are mad at you, you know you must be doing something right!

"A study by the American Speech Language Hearing Association suggests that use of personal listening devices are contributing significantly to an alarming hearing loss trend in teen and even pre-teen users"

Aminoglycosides, Aspirin, Free Radicals, Antioxidents, and Wine?

Wine looks to be out of place here, but read on…

Gentamicin, a drug in the Aminoglycoside family, has long been a known, potent cochleotoxic agent. Nevertheless, its cochleotoxic concerns are sometimes only considered secondarily in lieu of treating life threatening bacterial infections.

A study appearing in The New England Journal of Medicine entitled *Aspirin to Prevent Gentamicin-Induced Hearing Loss* suggests that the risk of Aminoglycoside-induced hearing loss might be significantly reduced with concomitant prescribed use of aspirin in high doses. Authored in part by *Dr. Jochen Schacht of the University of Michigan Medical School*, this study reports a 74% reduction in the rate of hearing loss in patients prescribed aspirin compared to a placebo group.

Citing earlier animal research which suggests that Aminoglycosides produce "Oxygen-Free Radicals" believed to damage cochlear sensory cells, the authors suggest that attacks by Oxygen-Free Radicals might be blocked by Antioxidents. In theory, Oxygen-Free Radicals are believed to be a by-product of ongoing (normal) cellular generation that initiates damaging effects to cell structures. Antioxidents, on the other hand, are theorized to counterbalance the presence of free radicals to maintain healthy cell conditions (Rice University; http://www.rice.edu/~jenky/sports/antiox.html). Free Radicals are also thought, in theory, to be produced in response to certain antibiotics and even noise exposure.

-Now for the wine connection. Salicylate is a so-called Antioxidant found in aspirin and Resveratrol is believed to be an Antioxidant found in red wine and vegetables.

In a separate article, Dr. Schacht is clear to report no direct evidence to suggest that a diet rich in antioxidants (i.e. drinking moderate amounts of red wine, for example) prevents hearing loss in humans. However, he cites animal research suggesting that rats limited to restricted diets showed less age-related hearing loss than those left to diet freely. He goes on to say "I wouldn't say it is proof for antioxidants," says Schacht. "The jury's still out on that, but it certainly can't hurt to increase the amount of green vegetables, red wine or green tea that you consume (*Let's hear it again for the benefits of red wine*; The Lansing State Journal; Andy Coghlan, New Scientist magazine).

Increased Risk of Tumor Development Due to Unprotected Noise Exposure

A recent study reported in the *American Journal of Epidemiology* suggests that repeated, unprotected noise exposure may increase risk of the development of a benign tumor called a Schwannoma, Vestibular Schwannoma, or less appropriately Acoustic Neuroma.

A Vestibular Schwannoma is a slow progressing and most often benign tumor arising from Schwann cells that insulate the Vestibulocochlear (8th) cranial nerve. The Vestibulocochlear nerve relays neural activity associated with hearing and balance functions.

The Schwannoma often exerts pressure on the area of the nerve tied to hearing or balance function resulting in initial symptoms such as unilateral hearing loss, tinnitus, and/or dizziness and loss of balance. In more advanced stages, the tumor may invade the Trigeminal nerve resulting in facial numbness and/or paralysis. Left unchecked, Schwannomas may enter brain space and become life threatening.

The study reports increased risk of Schwannoma for persons exposed to *unprotected* noise associated with machines, power tools and/or construction (a 1.8 times more likelihood); *those exposing themselves to music showed a 2.25 increased likelihood of tumor development.* These findings bolster the benefits of use of appropriate hearing protection even for "recreational" activities since those reporting consistent use of hearing protection carry a risk (of Schwannoma development) equal to those not exposed at all.

Scientists theorize that unprotected noise-induced cochlear damages the otherwise normal process of cellular repair (DNA replication) that follows cellular damage; such discrepancies then may generate "chromosomal change essential for neoplastic transformation." (Jess Dancer; Advance For Audiologists; 2006)

"These findings bolster the benefits of use of appropriate hearing protection even for "recreational" activities since those reporting consistent use of hearing protection carry a risk (of Schwannoma development) equal to those not exposed at all."

ATTENTION!

In an effort that we provide this newsletter electronically as well as to inform you of immediate professional announcements, please email us your email address to:

robertwilliams@tkontheweb.com

T K Group News is written by:

Dr. Robert Williams, Audiologist

Director Audiology

News Shifts call for New Determinations (continued)

a new and separate determination is required for each distinct shift event. It is not uncommon, however, for an employee to sustain a Recordable event in one ear, only to turn around to sustain another shift in the other ear upon retest. When this occurs, your T K Group reviewing Audiologist will address both shift events in the determination such that both shift events are properly addressed.

Although employee Jones shifted last year and that event was deemed non-occupational (by a T K Group, in-house, or third party professional), a new determination must be secured for each "new" shift event. Employee case histories (noise exposures, hobbies, health status) may change from year to year; accordingly, a "fresh" case history (Extended Questionnaire) is required to rule out newly developed occupational influences.

Hearing Loss Drug Enters Clinical Trial Phase

A US pharmaceutical company has initiated Phase 1 clinical trials of the drug SPI-1005 in hopes of proving its effectiveness in reversing and/or preventing noise-induced hearing loss.

In its current form, SPI-1005 will be consumed orally. SPI-1005 contains a selenium based enzyme Glutathione Peroxidase, which in numerous independent animal studies was shown to prevent and treat noise-induced cochlear damage.

Bret MacPherson, VP and Director of Clinical Operations at Sound Pharmaceuticals, expects this trial to make way for more extensive Phase 2 trials involving servicemen/women in the United States Army and Navy.

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Before a drug is made available to the general population of physicians in the United States, exhaustive clinical trials are required which take place in four phases.

Phase 1 trials involve use of the drug on 20-80 healthy male volunteers Between the ages of 18-45 years of age. Phase 1 trials attempt to establish dose toxicity to establish safe dosage levels.

Phase 2 trials initiate only after reasonable drug safety has been established based upon Phase 1 findings. Phase 2 trials attempt to verify drug efficacy and establish appropriate dosage levels to participants exhibiting conditions for which the drug was developed.

If Phase 2 trials are successful, Phase 3 trials begin with larger populations and often incorporate experimental dispensing of the drug by physicians to their patients.

Phase 4 trials involve ongoing testing with large populations after formal FDA approval. Phase 4 trials also seek to include certain high risk populations (i.e. pregnant women, children, elderly) for further refinement and/or exclusion.

CAOHC CERT/RECERT COURSE

We still have openings for the **CAOHC course to be conducted July 11-13, 2006. If you wish to participate, please contact Beth Minnick at (815) 964-5445**