The Effect of Over-the-Head Listening Devices on Noise-Induced Hearing Loss (NIHL)

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The purpose of this project was to further understand the impact that over-the-head listening devices contribute towards noise-induced hearing loss (NIHL). A primary cause of noise-induced hearing loss is the use of over-the-head listening devices which can cause nerve damage, although these devices intend to refine the sound quality of auditory materials. It was hypothesized that if the decibel level was increased in combination with the distance the over-the-head hearing device was from the ear, the likelihood of nerve damage would increase due to the proximity at which the tone is amplified. One model was built to replicate that of the human ear and then tested using materials meant to simulate that of over-head listening devices. The model included a circuit that carried the sound from the outside of the ear model to the center where amplification was measured using a decibel meter. 10 trials were conducted at each of these levels: 80 dB, 85 dB, 90 dB, 95 dB, 100 dB, 105 dB). After all the trials were conducted it had been found that all results were significant excluding two, at which headphones and earbuds had very similar outputs. External factors that may have contributed to this include the changes in decibel level in the area the experiment was conducted. The results of this project indicated that the earbuds coherently held the ability to cause the most nerve damage and therefore proved the hypothesized statement for this project correct, as they were the closest to the internal ear.

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