

THE INFLUENCE OF INSERTION DEPTH OF INSERT EARPHONES ON AUDITORY THRESHOLDS

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This study was done to see the influence of different insertion depth of insert earphones in the external ear canal on hearing threshold levels (HTLs). Thirty normal-hearing adults, aged 18 to 26 years old participated in this study. This study was carried out using E-A-RTONE 3A insert earphones with E-A-RLINK 3A and 3B. Insert earphones were marked with 3 different lengths to mark deep, medium and shallow insertions. Pure tone audiometry (PTA) test was done in 2 dB steps using these 3 different depths of insertion. The results were compared with thresholds obtained from TDH 39 with MX-41AR cushion in 5dB and 2 dB steps. The tests were performed twice to measure the test-retest reliability. Data were analyzed by one-way ANOVA to seek for the existence of significant difference between the thresholds. Test-retest reliability was tested with Pearson correlation test. There was no significant difference revealed for thresholds measured using supra aural and insert earphones with different insertion depths, except at 250, 2000 and 8000 Hz ($p < 0.05$). HTLs measured using insert earphones were 1.3 to 6.9 dB lower at 250 – 4000 Hz and 10.9 to 16.2 dB higher at 8000 Hz, compared to thresholds obtained through supra aural earphones. Differences in thresholds obtained from the 3 insertion depths were statistically significant at 250 Hz and 8000 Hz ($p < 0.05$). The results of this study highlighted the importance of applying correction factors on HTLs at 250, 2000 and 8000 Hz if insert earphones and supra aural earphones were used interchangeably.

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