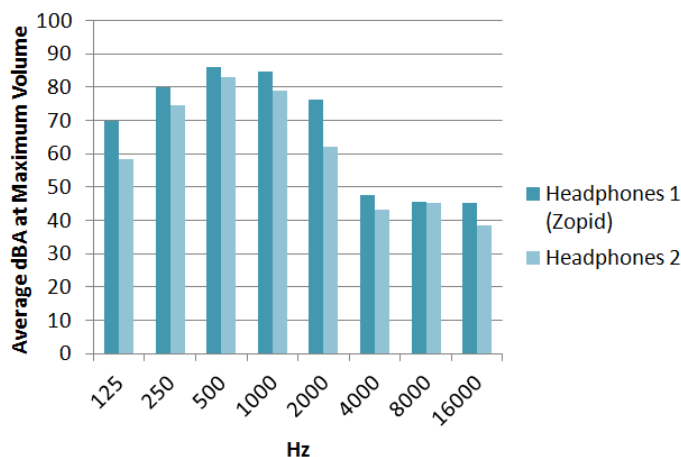


Acoustic Evaluation of Surgical Serenity Solutions Headphones

Overview: An acoustic evaluation of two sets of Surgical Serenity Solutions headphones was performed on 6/7/16 at the research labs of the University of Louisville Program in audiology. Testing was performed with a calibrated Quest Technologies Sound Pro sound level meter in a sound treated booth. Measurements were made in dBA using slow impulse time weightings. Levels were assessed individually at the octave bands from 125 through 16,000 Hz. Each headphone was sampled over four 10-minute sequences (40 minutes total), during which time the first mp3 track of the headphones played continuously. It was explained to us that the first and second mp3 track on the headphone are identical and each is approximately 45 minutes in length. Prior to performing the measurements, the volume setting on the headphones was increased until no further volume changes were noted. This we defined as the maximum volume setting of the devices. Subjectively, the volume selector seemed to provide a good dynamic range. At its minimum setting no sound was audible.

Results: The average dBA values for each set of headphones are included in the figure below. At maximum volume, the average dBAs did not exceed 90. The maximum average level observed was at 500 Hz for Headphones 1, which was approximately 86 dBA. All other octave bands showed average measurements that were less than this level, and most showed average levels less than 80 dBA. The mean time weighted average (TWA) across the four sampling trials for Headphones 1 (Zopid) was 72.70 dBA. This value was 68.18 dBA for Headphones 2.



Impressions: Occupational Safety and Health Administration (OSHA) guidelines recommend action when noise exposure is greater than or equal to 90 dBA for at least 8 hours, or when the 8 hour TWA is greater than or equal to 85 dBA. At maximum volume settings, neither headphone tested on today’s date would meet these criteria. Setting the volume well below maximum would further reduce levels in all frequency bands.

Measurement performed by:
Jeffrey Weihing, PhD, FAAA – Audiologist
Rachel Etzler, AuD SI – Graduate Student Clinician