



Don't Forget the 8's!

29 CFR 1910.95 (Occupational Noise Exposure) mandates the following:

“Audiometric tests shall be pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz” (h)(1). Notably absent is the 8000 Hz test frequency. While OSHA does not mandate inclusion of 8000 Hz, T K Group will always test 8000 Hz on all mobile vans; we also strongly urge that all in-house and/or clinic tests include 8000 Hz-for good reason. To the professional reviewer of audiometric data, knowledge of 8000 Hz data is often crucial in determining noise-induced versus non-noise induced etiology.

The “4000 Hz notch” is a watered down term to describe “suspect” noise-induced audiometric characteristics, however since noise-induced cochlear damage may also present loss at 3000 and 6000 Hz, the term “mid frequency notching” collectively describes noise-induced loss at 3000, 4000, and/or 6000 Hz. Typical noise-induced induced hearing loss presents itself audiometrically by loss at 3000, 4000, and/or 6000 Hz followed by recovery (better hearing) at 8000 Hz. With this in mind, it is not uncommon to see notching in non-noise induced cases-a fact that underscores the value of a complete and accurate aural case history (Extended Questionnaire) when assessing loss etiology. While noise-induced hearing loss often initiates at 4000 or 6000 Hz and spreads downward to adjacent lower frequencies, it can initiate at 3000 Hz or even lower at 2000 Hz depending on the intensity and/or spectral (frequency) properties of the noise source (s).

Many non-noise induced hearing loss patterns, such as those commonly seen with presbycusis (age-related loss), are identifiable by a “precipitous” or “ski slope” loss pattern in which the degree of loss is greater at 8000 Hz than that at preceding frequencies.

Consider the below audiogram examples, first without 8000 Hz and then with 8000 Hz:

500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
10	20	25	35	45	55	?

Is this loss pattern consistent with noise-induced etiology? Without 8000 Hz, this question is difficult to answer. Now consider the below audiogram with 8000 Hz information:

500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
10	20	25	35	45	55	25

With 8000 Hz information, a much clearer picture of potential noise-induced etiology is presented. Another important reason to always include 8000 Hz is to document historical loss trends in the event of future compensation litigation. Consider the following audiogram example, first without 8000 Hz and then with 8000 Hz.

500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
10	20	25	35	45	55	?

500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	8000 Hz
10	20	25	35	45	55	75

With 8000 Hz information, this audiogram is most consistent with non-noise induced etiology.

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