Okay, I'll Say It: Maybe People Should Just Remove Their Hearing Aids When Listening to Music!
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The following represents a summary of several blog-posts from Marshall Chasin, AuD, and his column atwww.hearinghealthmatters.org/hearthemusic.
—David Kirkwood, HHM.org

The Blogs @ Hearing Health & Technology Matters!
Hear Well, Live Well!

It's true that, as dispensing professionals, we usually encourage our patients to use their hearing aids in as many environments and in as many circumstances as possible. However, I'm always amazed by how *little amplification* is required for listening to music. My typical suggestion is that most people with a mild-to-moderate hearing loss should simply remove their hearing aids as they provide little or no gain for the more intense components of music. And, as a general rule, when listening to or playing live music, this is probably correct.

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Some inherent problems for hearing aids and music processing. Most hearing aids distort with inputs in excess of 95

dBSPL, and this has nothing to do with the processing or the cost of the hearing aid; it has *everything* to do with the analog-to-digital converter (and a 16-bit hearing aid). These "front end" devices are found in all digital hearing aids and, with the exception of four innovations on the market today, are severe limitations for listening to high-fidelity distortion-free music. The four innovations are:

- The K-Amp that has no analog-to-digital converter;
- All hearing aids with the HRX circuit (initially from Gennum, then purchased by Sound Design, and most recently purchased by ON Semi-conductors);
- Those with a low-cut microphone (-6 dB/octave); and
- Those with a front end that can auto-range from 15-111 dBSPL rather than the 0-96 dBSPL found in most other 16-bit systems.

These technologies exist and work wonderfully well for musicians and those of us who just like to listen to music.

A discussion of those hearing aids that possess the above technologies is from previous blogs (go to**www.hearinghealthmatters.org/hearthemusic),** so I won't dwell on them, other than to point out that the solution to hearing aids and music is *not* a software adjustment issue, but is related to whether the analog-to-digital converter is over-driven by the more intense components of music. Once music is distorted, no amount of "software fiddling," which occurs later in the circuit, can improve things. *The trick is not to distort the music at the "front end" of the hearing aid.*

Having dispatched with that subject, I would now like to dwell on gain corrections for music versus those for speech.

dBHL at 1000 Hz	65 dB input	80 dB input	95 dB input
15	0	0	0
25	2	1	0
35	8	4	0
45	14	7	0
55	20	10	1
65	28	15	2
75	36	20	3
85	44	24	4

Table 1. Gain needed for a hearing loss (in dBHL at 1000 Hz) for inputs of very soft (65 dB), comfortable (80 dB), and comfortably loud (95 dB) music.

Soft speech, average speech, and loud speech are typically taken to have inputs of 55 dB, 65 dB, and 80 dBSPL, but this does vary from manufacturer to manufacturer and from fitting algorithm to fitting algorithm. Although we are not sure exactly which numbers to use for soft, average, and loud speech, suffice it to say that the most intense components of speech are on the order of 80-85 dBSPL. It turns out that loud speech is comfortably average music—that is, everything is *shifted upwards by about 15 dB* for the analogous range for music.

Table 1 is derived from Fig6, but almost identical data could also have been derived from the latest versions of the NAL and DSL fitting formulae. The table shows the amount of gain for a range of hearing losses in dBHL at 1000 Hz for very soft music (65 dB input); comfortable music (80 dB input); and comfortably loud music (95 dB input). Even people with a hearing loss of 85 dBHL at 1000 Hz may need only 4 dB of gain for comfortably loud music (Table 1).

While the gains for 65 dB input levels (very soft music and average conversational speech) are well defined by NAL and DSL, the 95 dB input (comfortably loud music) is not typically considered by most dispensing professionals. Even for severe hearing losses, only a few decibels of amplification are required.

So…my general clinical rule: "Most people with a mild-to-moderate hearing loss should simply remove their hearing aids when listening to live music" is probably quite true.

Agree or disagree? Comment on Dr Chasin's Hear The Music blog or e-mail him at .