

## **Hearing Loss and Fatigue**

Hearing is a very passive sense. It is always on 24/7. Listening is an active process. It requires focusing and paying attention to things that are of interest to us like speech while dismissing things of less interest like background noise. The auditory system is designed to use the ear to hear sounds, send the signal to the brain which simultaneously processes the signal of interest, connects meaning to the sound and filters the unwanted signals. This is called cognitive processing. Successful processing results in listening.

Cognitive aural processing takes a great deal of effort. When we are young and our hearing is normal, humans are able to seamlessly process rapid speech in high levels of noise (young females are the fastest processing demographic). The older we get, the more time and effort it takes to listen.

### ***Hearing Is a Sense, Listening Is a Skill***

For people with hearing loss – even those with hearing aids, listening is more likely to require additional cognitive resources to process the information. If someone has had untreated hearing loss for a long time, the memory of hearing doesn't match what is being heard so the brain has to spend a great deal of energy and effort to fill those gaps. For people with hearing aids, the amplified signals need to "connect" to meaning in the brain in order for the sound to have purpose. This simultaneous mental processing is like constantly multi-tasking: hearing, focusing, processing, ignoring, all at the same time. It takes a great deal of mental exertion or "listening effort" to do these tasks. Many of my patients feel that they hear better in the morning. Actually, they LISTEN better in the morning because they are rested (less fatigue).

### **"Listening is where hearing meets brain."**

Prolonged listening effort is more than just mentally exhausting, it causes physical fatigue. Many of my patients talk about how tired they are after spending time in a noisy restaurant or large group. For people who have hearing loss but don't wear hearing aids, this level of fatigue is noted with even minimal background noise.

Hearing aids can certainly help with signal detection. You have to be able to hear sound before you can listen. Advanced hearing aid technology can even clean up some of the signal to improve the speech-to-noise ratio. But it is the brain that needs to do the filtering, sorting and processing. People who start early in their hearing loss progression have less "new" sounds to process. They acclimate and attach meaning to sound more quickly than people with greater hearing loss and/or older brains. Ultimately, reducing mental exhaustion and physical fatigue associated with listening effort.

### **Attention, Cognition and Listening**

Paying attention has everything to do with listening and cognition. Even with normal hearing I am guilty of missing communication because I am not paying attention to the speaker. When I have something on my mind or I am busy with another task (like reading) I have insufficient attention to the desired speech signal. Saying a person's name before engaging in conversation is a great way to draw attention to the desired speech signal. Whether we like it or not, our brains are keen when we hear our name and we will automatically pay more attention to the following conversation.

Using Aural Rehabilitation (AR) exercises can also help reduce listening effort and fatigue. These exercises are designed to help the ear work with the brain to reconnect sound with meaning. There are

several on-line or app based AR programs. There are cognitive exercises to help the brain learn how to ignoring background noise. Other programs focus on speech sound recognition.

I like the LACE (Listening and Communication Enhancement) program by Neurotone. We have these available for FREE use. It takes about 30 minutes a day for 20 days. There is also a web based version of the program available at [www.neurotone.com](http://www.neurotone.com)

Another option is the Computer-Assisted Speech Training (CAST). CAST was originally designed for adults with cochlear implants but it can be adapted for use with adult hearing aid wearers. CAST uses more than 1000 novel words spoken by four different talkers. For more information go to [www.tigerspeech.com/tst\\_cast.html](http://www.tigerspeech.com/tst_cast.html)

You can also do some simple home exercises like reading out loud for 15 minutes/day. Your eye will see the sound-your ear will hear the sound- and your brain will say "oh, that's how that sounds through the hearing aid. First time hearing aid wears can start this exercise in quiet but for more experienced wearers I like to suggest adding a competing signal like the television or radio playing in the background.

A final AR exercise is to have someone read a sentence (I suggest just pulling random sentences from a book or magazine) and have the hearing aid wearer repeat the sentence verbatim. If it is correct, select another sentence. If it is incorrect, repeat the sentence a second time. If it is still incorrect have the listener read the sentence as the speaker repeats the sentence again.

The best way to address fatigue associated with hearing loss is to wear your hearing aids consistently. Start with hearing aids as early in the hearing loss progression in order to keep auditory memory and aural processing skills intact. Improving hearing sensitivity and enhancing listening skills will reduce the mental exhaustion and physical fatigue associated with hearing loss.