

# Hearing Aid Services of Hollywood

maximizing your hearing potential  
with today's technology

Preferred Patient Newsletter  
Issue 57 — Summer 2021

7080 Hollywood Blvd., Suite 814

Los Angeles, CA 90028

Phone: (323) 463-7109 • Fax: (323) 463-7707

Website: [lahearing.com](http://lahearing.com)



## Jeff's Corner

This edition of the newsletter will stray from its usual format to discuss a significant innovation that has provided substantial benefits to all of my patients who have experienced it. The information is more technical than our typical content, so please don't hesitate to contact me with any questions.

Jeff

## The Benefits of a Deep Neural Network (DNN) to Hearing Aid Technology



We sometimes become desensitized to claims that a new device is a “technological breakthrough” or offers “cutting edge” performance. Such statements are often met with skepticism, and rightly so. Hyperbole seems to be the hallmark of every company’s efforts to attract the attention of potential customers, increase sales and dominate the marketplace.

But what if the claims are true? What if the device truly crosses into a new frontier of technological performance? It would be important to understand why that occurred and objectively assess the data that supports the claim. In addition, we should investigate the subjective experiences of those who have tried it and judge their credibility.

Deep Neural Network (DNN) technology is a subset of machine learning which, in turn, is a subset of artificial intelligence. DNNs are signal processors that make sense of the extraordinarily complex acoustic environment, not by applying a prescribed set of instructions, but by learning through experience, much the way the human brain learns and develops. The complexity of the soundscape eliminates the use of an explicit set of rules that explains the data and determines how it must be processed. Instead, the DNN processor is trained with millions of sound samples that include clear speech and a range of competing sounds. The processor “learns” to identify all the acoustic parameters that help to differentiate speech from noise. This learning is digitally embedded onto the microchip that resides within the hearing aid.

### DNN Reduces Your Listening Effort

According to Don Schum, PhD, Vice President of Audiology at Oticon, *“Every sound that passes through the device is compared to the results of what was discovered in the learning phase. Clearer contrasts are created as speech signals are protected and competition is reduced. This allows the device to process speech... not based on a limited set of rules that we wrote but rather based on extensive experiential learning.”*

DNNs are large, power-hungry signal processors, so incorporating them into the design of a tiny hearing aid was a challenge. The Oticon engineers successfully customized the DNN to meet the space and power requirements of a mini RITE style hearing device – *the More* – released in January.

Objective test results of hearing aid users’ brain responses to sound while wearing *the More* were obtained using electroencephalography (EEG) and speech understanding in noise. In the EEG study, the ability of *More* hearing aid wearers to orient to the full sound scene improved 30% when compared to a situation where listeners wore a hearing aid with the earlier *Open S* processor. The EEG results for the subjects wearing *the More* with an active processor were 60% better than in the condition where the processor was inactive. Additionally, tracking of two simultaneous talkers within the complex sound environment of the test improved by 20% over the previous *Open S* model.

In another study, researchers assessed the speech comprehension of listeners wearing *the More* in an environment consisting of three speakers in the foreground and three sources of competing noise in the background. Speech understanding with the activated *More* processor improved 15% when

compared to a condition in which the processor was turned off and 5% when compared to performance with the *Open S* hearing device.

## Patient Feedback

As reported in our previous newsletter, we have received exceptionally positive feedback from patients who have been wearing the new *More*. An example is an email sent to me by an experienced hearing aid wearer and a longtime patient of the practice (reprinted with permission):

*"After using the last few generations of Oticon and other hearing aids, I upgraded to the *More* about a month ago. Before I purchased, I researched the *More* and found a small Oticon study that showed a 15% improvement but what it didn't describe was the profound naturalness that results from using them."*

*"They are subtly more effective in all situations. That is, I hear more naturally and significantly more clearly in all areas of my life. I say subtly because the result of using them is transparent. The technology empowers instead of*

*getting in the way, as has been the case with other hearing aids."*

*"Having graduated from M.I.T. in Artificial Intelligence, and having developed an AI system for mapping the human unconscious mind, I can say somewhat authoritatively that Oticon's use of AI is what I've always believed AI should be about: empowering humans to be more human."*

*"So, thanks for introducing me to the Oticon *More* and for setting them up superbly." Stuart L., PhD*

---

I have been an audiologist since 1975, and I have observed countless industry developments over the years. However, current hearing aid technology, specifically Oticon *More*, which incorporates DNN advances, has achieved a sweet spot for my patients that I never imagined. If you haven't yet scheduled an appointment for a demonstration, please consider doing so. We look forward to seeing you!

## Hearing Loss is Common in Patients with Chronic Kidney Disease



Chronic kidney disease (CKD) is a major global public health challenge. Inadequate filtering of metabolic waste products by the kidneys results in circulation of toxic materials in the body. The increased level of toxins can cause damage to tissues and organ systems.

Hearing loss has been associated with kidney disease for decades. The link has been explained by structural and functional similarities between tissues in the inner ear and in the kidney. The kidney shares anatomical, physiological, immunological, and pharmacological similarities with the stria vascularis of the inner ear (support structure of the sensory organ). Studies have shown that various drugs (e.g., aminoglycosides) given to patients with severe

infections, act on both organs with toxic effects. In addition, kidney disease and hearing loss share common risk factors, including diabetes, high blood pressure and advanced age.

When toxins accumulate due to poor kidney function, damage to the fine nerve structures of the inner ear is soon to follow. According to a 2019 report in the *American Journal of Kidney Diseases*, older adults with moderate chronic kidney disease have a higher incidence of hearing loss than those without this disorder. The journal cited the results of an earlier study in 2010 of 2,900 subjects, conducted in Australia, that included 513 individuals aged 50+ years with moderate chronic kidney disease. Of those with CKD, 54% reported some level of hearing loss compared to only 28% of the rest of the group. Nearly 30% of the CKD participants showed severe hearing loss compared with only 10% of the non-CKD participants.

*"These findings could lead to a modification of the usual care of people with CKD," said Dr. Kerry Willis, Senior Vice President of Scientific Activities at the National Kidney Foundation. "Earlier clinical hearing assessments and fitting of hearing aids in CKD patients can improve quality of life and lead to better management of underlying conditions which could, in turn, potentially preserve hearing function."*

If you have a kidney problem, a family history of kidney failure or any of the conditions (e.g., diabetes) that can lead to one, it makes sense to have your hearing evaluated on a yearly basis.

For more information about chronic kidney disease, visit the National Kidney Foundation at [www.kidney.org](http://www.kidney.org). This organization is dedicated to preventing and treating kidney and urinary tract diseases, improving the health and well-being of individuals and families affected by these diseases and increasing availability of all organs for transplantation.