

Central Presbycusis Counseling

By Dennis Colucci, AuD, MA

The goal of hearing rehabilitation in adults is to help them overcome their hearing difficulty and its effects on communication, environmental awareness, interpersonal relationships, and social engagement. Most importantly, hearing rehabilitation should result in the reduction of the psychological effects of hearing loss, such as communication stress, anger, depression, and the feeling of isolation. Without hearing improvement in the patient's daily activities and quality of life, the validity of hearing health care is questionable.

Treating hearing loss is not a simple operation of providing patients with hearing aids, sending them out into the wild to sample improvements, and expecting the hearing device to know all and do all. In fact, its complexity continues to be the reason behind the unnecessary high return rate of hearing aids. Hearing rehabilitation is an intricate process to help patients re-develop and maximize their hearing skills today, tomorrow, and for a lifetime. This is accomplished by re-training auditory skills governed by the central auditory processing system, which in turn results in neuroplastic changes that have long-term benefits.

PRESERVING BRAIN REALITY

The brain utilizes billions of neurons within and between connected networks, its operations depend on years of memories and experiences to construct our individual brain reality. In hearing, each encounter with and nuance in sound, noise, and speech can be depicted in the brain as new, different, known, threatening, pleasant, important, interesting, or inconsequential.

For older adults with hearing loss, sound and speech without nuance and clarity can become confusing, difficult to interpret, uncomfortable or stressful, or not worth the effort to engage. The brain's reality of how meaning is attached to the world is eclipsed by degraded hearing. The dilemma of central presbycusis for seniors is not just about the lack of sound or difficulty with communication; it is also about the effects of systematic changes from aging and hearing loss on the brain.

Modern research confirms that even mild hearing loss is a primary culprit in accelerating the reduction of the whole and regional brain size by approximately six to seven years. There is also a commensurate decrease in cognitive function (*Hearing Journal*. 2014;67(4):48). From the Baltimore Longitudinal Study that investigated 1,100 elderly patients for 11 years, we know that "hearing loss is independently associated with accelerated cognitive decline and incident cognitive impairment



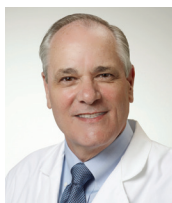
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in community-dwelling older adults" (*Neuropsychology*. 2011 Nov;25(6):763). Cognitive function is very important to brain reality because it refers to the processes that involve thinking, knowing, remembering, judging, and problem-solving. This and other studies show that central presbycusis can be a contributing factor to memory loss, dementia, and Alzheimer's disease.

THE STORY OF CENTRAL PRESBYCUSIS

When hearing care professionals tell patients that hearing loss is a "use it or lose it" situation, they miss an important opportunity in patient care and counseling. Instead, professionals can share the story of central presbycusis—a motivational tale that encourages patients to comply with the standard process of obtaining a hearing device and promotes the successful and daily use of hearing devices. Inviting patients and their families to learn about hearing development, maintenance of skills, and changes involved in age-related hearing loss can empower and support patients in their decision to seek help. The goal is to present counseling as an interesting and easily understandable process, while discussing the changes that occur in the brain and cognition. The story provided in the blue shaded section can be a teaching tool for patients and their families.

Central presbycusis can be a difficult condition to explain to patients. Presenting it as a story can make it more



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Once upon a time, during fetal development at about 20 weeks of gestation, our hearing capacity begins. At this time, we hear the lower tones of our mother's voice and develop our first recognition of a parent. We also hear internal sounds of our mother's digestion and other body noises. Because of this connection, it is suggested that the first musical instrument is probably the mother singing to her unborn child. Since the womb is not soundproof, we also hear some low-tone noises from our mother's environment, and these sounds are added to our memories.

At birth, typically at 40 weeks of gestation, our auditory system continues to mature as we learn more about our environment and store new memories. Remarkably, soon after birth, we can recognize our mother's voice. However, we may not identify our father's voice until a few weeks later as we gain more experience and voice memories. This demonstrates that hearing is a learned behavior that takes time to develop; it is not automatically present when we are born.

As time goes on, our nervous system matures, and more signals are sent from the ears to the brain. By the end of the first year, the signals are more complete, but the brain is not functioning at the adult level. Listening skills—like telling the direction of sound, tolerating sound, hearing in noise, following conversations, and keeping up with fast speech—develop along the way. However, these skills are not completely developed at an adult level until the age of 12. From this point forward, our learning abilities, memory support, and auditory skill maintenance continue, and our hearing usually appears seamless until we age.

For most parts of our lives, we may take our hearing for granted. However, as we reach our 50th birthday, things start to change, and by our 60th birthday, a third of us develop hearing loss. When we turn 75, most of us have some degree of hearing loss. During this period of change, we gradually lose some of our hearing skills and sound memories. Although we can still hear sounds even with some degree of hearing loss, these sounds are not perceived at normal levels and some may be completely lost. Most of us may experience problems hearing in noise, have issues with soft speech, ask people to come closer and talk louder, misinterpret words, turn up the TV, not enjoy music, and feel left out of conversations. These changes occur because daily sounds, random noise, and speech communication are primarily driven by the ear and activities within the brain. Hearing drives social engagement, learning, and memory—activities that in turn reduce brain isolation and promote essential cognitive functions. Without daily maintenance of these normal sounds, the brain unwinds what is known. At this stage, the use of hearing devices can help us hear clearer speech and get better sound reception to connect us with our environment. The daily use of hearing aids will naturally retrain some of our important hearing skills, including hearing sounds around us, sounds at a distance, and sounds coming from different directions.

appealing and comprehensible. Through this story, patients will have a better understanding of how long it took them to learn and maintain hearing skills and memories and how quickly these skills can be lost as they age. The story can also help patients understand why hearing and connective devices can greatly improve their engagement and reduce isolation. These devices may not resolve all difficulties, such as listening to fast speech and foreign accents, and hearing with background noises due to nerve damage and processing dilemmas. However, they can support better hearing in most situations and help improve a patient's quality of life. 