

# Editorial

## Hearing and the Brain: Audiological Consequences of Neurological Disorders



Patients with well-defined lesions of the auditory system can be great teachers to those of us interested in the structure and function of this system. This is especially true when the lesions are in the central auditory nervous system (CANS)—the part of the auditory system about which we know the least. Although animal studies on the effects of lesions in the CANS have made important contributions to our knowledge of auditory function and its anatomical correlates within the central nervous system, information obtained from humans with brain lesions can provide insights that cannot be realized in other ways. Humans can provide their own perspectives on their hearing difficulties in everyday situations. They also can communicate their impressions and experiences both during and after test sessions. Finally, and perhaps most importantly, patients can share information as to the strategies that they have developed in order to cope with their auditory problems.

Unfortunately, there are relatively few reports on patients with CANS involvement in the audiological literature. Although this picture is changing, there remains a paucity of data on how people hear (or do not hear) when the CANS is compromised. Information as to how people with various compromises of the CANS process and analyze auditory information is critically important to clinicians engaged in the evaluation and management of children and adults with possible auditory processing disorders (APD). In the assessment of children with APD associated with learning disabilities, the goal is to determine if there is central auditory dysfunction. What bet-

ter way to learn to do this than to gain experience on testing those with central auditory dysfunction as determined by documented lesions of the CANS. Not only does this experience sharpen the clinician's insights as to the auditory behaviors associated with true central auditory disorders, but it can also provide the clinician with valuable information as to which tests have the best sensitivity and specificity for detecting central auditory disorders. This information can provide guidance in test selection for other populations that require evaluation of the CANS.

Clinical and research experience with patients with known CANS compromise has impacted and will continue to impact our knowledge of the anatomy, physiology, and pathophysiology of the auditory system. For example, studies on split brain cases and cases of central deafness have provided knowledge about the structure and the function of the human CANS that was essentially unobtainable in any other way. Advances afforded by modern imaging techniques will allow even greater advances in establishing links between symptoms, test performance, and functional anatomy of patients with CANS damage. Progress will soon allow certain test performance patterns to be tightly correlated to specific neuroanatomical substrate. In keeping with this concept, the articles in this issue reflect an effort to draw relationships between performance on contemporary audiological tests and anatomical information provided by modern radiology. This approach has been utilized and embraced by neuropsychologists for many years to validate their tests and better understand

brain function and dysfunction. It is hoped more of these kinds of studies will emerge in the audiological literature.

The articles in this issue demonstrate the utilization of diagnostic strategies as well as rehabilitative approaches in the study of each of the patients reported. Each case represents its own set of challenges; therefore, each case study required slightly different diagnostic approaches. It has been said that no two cases of neurological involvement are the same. This is certainly true in the cases represented in this special issue. The audiological profiles noted in the cases reported were quite different across the subjects. However, the one common trait noted in all of the patients profiled in this special issue was that they all had auditory symptoms; in fact, in the majority of these patients, these symptoms were severe and affected their everyday lives. These subjective complaints, as well as the objective test findings for these cases, hopefully will make for interesting and enlightening reading for the individual interested in learning more about the assessment and management of auditory problems in patients with CANS compromise.

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