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AUDITORY NERVOUS SYSTEM PLASTICITY: APPLICATION TO COCHLEAR IMPLANTATION

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There are two types of plasticity in the central auditory nervous system. The first type is due to the development of neural connections during a critical period after birth. The second type results from a change in the responsiveness of neurones in the mature animal after neural connectivity has already been established. Developmental plasticity is important for cochlear implantation in children and adult plasticity for implantation in older children as well as adults. Plasticity in children is being studied with electrical stimulation and it has been shown that there is a critical period for speech perception. Speech perception is significantly better the younger the child. Further support for developmental plasticity is the fact that children with some residual hearing obtain better speech perception results than those without residual hearing. This study carried out in Melbourne suggests that some prior experience during the critical period leads to a more normal neural connectivity which can be better utilized with electrical stimulation from a cochlear implant.

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