Speech and the Brain

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NeuroDevelopmental Movement® practitioners work with many children and adults with speech and language issues. Since speech starts in the brain, it is valuable to understand the many ways that speech can be impaired due to birth trauma, stroke, traumatic brain injury, or other neurological challenges. Below is a description of challenges to speech production at different levels of the brain.

Your NDM practitioner will be able to give you much more detailed feedback about your child's particular speech anomaly and how it relates to gaps in the Developmental Sequence. Your program of NeuroDevelopmental activities will not be designed specifically for speech, but to help the brain mature, making fluent speech more available to the child.

Please be aware that in addition to helping these brain areas mature through a program of NDM activities, we may also advise that you seek a Functional Diagnostic Nutritional assessment, as some pathogens in the gut and the brain, such as H-Pylori can ALSO be 'stealers of speech.'

Broca's Area: Located in the frontal lobe of the dominant hemisphere (usually the left hemisphere for right-handed individuals), Broca's area is primarily responsible for the planning and coordination of speech production. Damage to this area, such as from a stroke or trauma, can result in a condition called Broca's aphasia, characterized by difficulties in forming words and constructing grammatically correct sentences.

Wernicke's Area: Situated in the superior temporal gyrus of the dominant hemisphere, Wernicke's area is involved in language comprehension. It helps with understanding spoken and written language and generating meaningful speech. Damage to Wernicke's area can lead to Wernicke's aphasia, where individuals have trouble understanding language and producing coherent speech that makes sense.

Motor Cortex: Located in the frontal lobe just in front of the central sulcus, the motor cortex plays a crucial role in the execution of voluntary movements, including the movements involved in speech production. Specifically, the face and mouth areas of the motor cortex control the muscles involved in articulation. Damage to this area can result in apraxia of speech, a condition characterized by difficulty coordinating the muscle movements needed for speech production.

Auditory Cortex: Situated in the temporal lobe, the auditory cortex processes auditory information, including the sounds of speech. It helps in perceiving and distinguishing different speech sounds. If there is damage to the auditory cortex, individuals may struggle to understand spoken language and have difficulties in reproducing accurate speech sounds.

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Corpus Callosum: The corpus callosum is a broad band of nerve fibers that connects the two hemispheres of the brain. It facilitates communication between the left and right hemispheres. If there is damage to or immaturity in the corpus callosum, it can result in a condition known as split-brain syndrome, where the two hemispheres are unable to exchange information effectively. This can lead to challenges in coordinating speech and language functions between the hemispheres.

It is important to note that the brain functions related to speech production are complex and interconnected. Challenges in speaking can arise from various combinations of impairments in these brain areas, depending on the nature and location of the injury or condition affecting the individual. Speech difficulties can manifest in different ways and may require specific interventions or therapies based on the underlying brain areas involved.

For more information, please contact an NDM consultant.

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