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قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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بالرسالة صفحات
لم ترد بالأصل

Developmental Apraxia of Speech

An essay submitted for the fulfillment
Of the master degree of Phoniatrics

Presented by

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Speech is a unique, complex, dynamic motor activity through which we express our thoughts, emotions, respond to, and control our environment. Thoughts are translated into linguistic representations, which are then sent to speech mechanisms that can coordinate, initiate, modify and execute the articulation of an utterance ***(Dronkers and Ogar, 2004)***. Speech is the neuromuscular process that allows humans to express language; it involves the very precise activation of muscles in the following systems: respiration, phonation, resonance and articulation ***(Duffy, 2005)***.

Speech motor control

Speech is a complex motor act that requires at least 140,000 neuromuscular events per second at the level of the motor unit; it would not be possible consciously to order each of those events to occur. The nervous system is arranged to provide maximum economy of function. The organized motor patterns are built into a hierarchy of six levels within the nervous system. These levels are interrelated, interdependent and interconnected. The upper levels act by activation, inhibition and modulation of the

lower levels. The lower levels act reflexly with synergism between extension and flexion ***(Darley et al., 1975)***.

The lowest level is that of the **lower motor neuron**. It includes the alpha (direct) system which is responsible for rapid skillful movement and the gamma (indirect) system which is responsible for maintenance of muscle tone and body posture. The lower motor neuron functions reflexly. The next level is the **vestibular –reticular** level, the role of the vestibular –reticular level is to regulate the activity of the lower motor neuron. The third level is **the extarpyramidal** level that is chiefly involved in the subconscious, automatic performance, regulation of muscle tone and inhibition of involuntary movement. The fourth and highest purely motor level is **the upper motor neuron** level anatomically represented by the motor cortex and responsible for skilled, discrete and spatially oriented movement. The fifth component is **the cerebellum**, which is responsible for detection and correction of errors that occur during the course of movement. It does this chiefly by inhibiting overactivity of the motor cortex, the

extarpyramidal structure, the vestibuloreticular structure and the spinobulbar segments.

The highest level of motor organization is **the conceptual-programming** level; this level is dependent upon the integration of a variety of cortical arrangements ***(Darley et al., 1975)***.

The conceptual programming stage represents the highest level of motor organization. It is concerned with establishing an idea or plan for activity, and specifying movements that must occur for the plan to be realized. It includes:

(1) Conceptualization.
(2) Spatial-temporal planning.
(3) Motor programming.
(4) Performance.
(5) Feedback ***(Duffy, 2005)***.

(1)Conceptualization

Conceptualization is the stage at which formulation of the desire to perform a specific act occurs. The purpose or idea behind the act must be retained until the act can be planned, programmed and performed. The result can then be monitored to discover whether the purpose has been accomplished

or not, conceptualization is the function of the brain as a whole ***(Duffy, 2005)***.

(2)Spatial-temporal planning (linguistic planning)

Once an idea and intention to express it is developed, the language system is activated to formulate the verbal message. During linguistic planning there are interactions between semantic and syntactic processes to yield an adequately formulated expression and the utterance takes phonological shape (abstract phoneme are identified and ordered). Linguistic planning also requires attention, retrieval, working memory processes and the ability to discard from active processing utterances that already have been formulated. Once these linguistic processes have been completed, a mental image of the verbal goal can be said to exist ***(Duffy, 2005)***.

(3)Motor programming

Speech motor programming is defined as the set of processes responsible for transforming an abstract linguistic (phonological) code into spatially and temporally coordinated patterns of muscle