HOW iLs INFLUENCES SPEECH

the neurological basis for iLs' impact on speech

INTRODUCTION

iLs' Total Focus System as well as the Interactive Language Program (ILP) have programs to help children and adults with various auditory processing and interactive communication skills by integrating and strengthening the extensive neural pathways of the auditory system.

IMPROVED EXPRESSIVE LANGUAGE

iLs' Interactive Language Program (ILP) provides a means to enhance sensory input (i.e. address subcortical functions) while continuing to address targeted speech-language and voicing goals, enhance auditory and language processing skills, and address the organizational components of speech and language. The direct auditory feedback loop (from the microphone to the bone conduction headphones) makes the ILP an interactive tool which can also help to improve social skills. When employed by speech therapists, the ILP is typically used as a dynamic and integral component of speech therapy.

Impacted Skills: auditory processing, expressive language, social skills

DECODING, PHONEMIC AWARENESS, LISTENING AMIDST NOISE

Decoding, phonemic awareness, listening in a noisy classroom and speaking clearly require efficient processing and storage of information. iLs processes classical music to emphasize different frequencies per therapeutic objectives. For example, the iLs Reading & Auditory Processing Program focuses on the mid-range frequencies of the English language to train and improve the perception and discernment of the subtle differences in closely related phonemes. This skill is essential for the development of spelling and reading proficiency. As a result of repeated listening, the vestibulo-cochlear system improves the subcortical transfer of auditory information to the brain. Additionally, the bone conduction delivery in iLs headphones provides an important stimulation to the vestibular system.

Impacted Skills: pitch discrimination, auditory processing, spelling, mood, concentration, balance

CEREBELLUM

The cerebellum has 10% of the volume of the brain, but it has 50% of the brain's neurons. In computer terms, the cerebellum is the processor, receiving input from sensory systems and various parts of the brain, and integrating these inputs to fine tune motor activity. Neuroscientists agree that the cerebellum is involved in motor functions, cognitive functions such as attention and emotional functions such as regulating fear and pleasure responses. The iLs Playbook's repetitive activities are designed to stimulate cerebellar function. Inputs from the visual, vestibular and auditory systems, session after session, train the cerebellum to become efficient at processing multi-sensory information.

Impacted Skills: motor control, "automaticity" (motor activities becoming automatic), processing

VESTIBULAR SYSTEM

Directly connected to the cochlea of the inner ear, the vestibular system is primarily responsible for balance and coordination, but also has a strong impact on sensory modulation and emotional regulation. Once the vestibular system is functioning well, children are better able to participate in higher brain functions such as reading, writing and expressive language. iLs provides specific and comprehensive stimulation to the vestibular system through bone conduction delivered via headphones, balance board activities and body movement exercises.
Impacted Skills: balance, coordination, self-regulation, focus

PROPRIOCEPTIVE

By improving the sense of one's own body - where it is, how to control it, how to move it – to the point where we don't need to think about it, we are freeing up the brain to focus on higher order activities. Children and adults who improve their proprioceptive abilities are able to approach learning and communication tasks in a more relaxed and regulated manner. iLs' movement program focuses on building proprioceptive abilities with specific exercises in each session.
Impacted Skills: attention, calm, athletics, coordination, daily movement, confidence

PARASYMPATHETIC

The Autonomic Nervous System (ANS) controls many organs and muscles that work in an involuntary, reflexive manner. The ANS is important in two situations: emergencies that require us to "fight" or take "flight" and non-emergencies that allow us to "rest and digest". The part of the ANS which governs the latter is the Parasympathetic Nervous System (PNS). iLs' auditory program stimulates the PNS through the Vagus nerve (auricular branch). Many children and adults beginning iLs programs are in a state of hyper-arousal, not far from "fight or flight". The gentle stimulation of the PNS brings about a balance of the ANS which is reflected by increased calm and self-regulation.
Impacted Skills: behavior, ability to focus

HEMISPHERIC INTEGRATION

Receptors in the body deliver sensory information to the brain (and vice versa). If these receptors and the pathways leading up to the brain are not working because they were damaged or did not develop properly, the activity level of the brain decreases and different areas of the brain may not communicate with each other properly. In addition, connections between the right and left sides of the brain must be robust in order to allow for proper communication to take place between the different areas involved in higher brain function. The combination of listening and cross-lateral activities in the iLs Playbook require the almost constant transfer of information from one hemisphere to the other, "exercising" the bridge that transfers information, the corpus callosum.
Impacted Skills: processing speed, cognitive functions, emotional health