



HOW iLS INFLUENCES ATTENTION & REGULATION

the neurological basis for iLS' impact on attention in both children and adults

ATTENDING & FOCUSING

Brain scans of ADHD individuals show the cortex as being hypo- or under-active, particularly in the frontal and temporal lobes. This suggests that the cortex is the source of the problem, which is not necessarily the case. In fact, the cortical (higher brain) function in ADHD individuals is often normal. In many cases, the problem is that there is insufficient input reaching the cortex. Higher brain functions such as reading are dependent upon adequate input from the brain stem and cerebellum. iLS' combined sound/movement approach stimulates sub-cortical activity, improving the ability of brain stem and cerebellum to process sensory information leading to the cortex.

Impacted Skills: regulation, attention, focus, learning ability

PROCESSING INFORMATION, LEARNING NEW TASKS

The cerebellum has 10% of the volume of the brain, but it has 50% of the brain's neurons. In computer terms, it's our processor, receiving input from sensory systems and various parts of the brain, and integrating these inputs to fine tune motor activity. Most neuroscientists agree it 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 believed 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

EMOTIONAL REGULATION, BODY AWARENESS

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: coordination, balance, focus, self-regulation

MOTOR PLANNING, REGULATION, AWARENESS OF PERSONAL SPACE

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

SENSE OF CALM, “GROUNDED”

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, the calm state which allows one to better focus on higher cognitive functions

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

ALERTNESS, ATTENTION, AND A GOOD NIGHT’S SLEEP

The Reticular Activating System (RAS) is a network of neurons deep in the brainstem that receives input from all sensory systems. It sends nonspecific information to the brain to “wake it up”. It is involved with regulating arousal, sleep-wake transitions, alertness, appropriate arousal to attend to the task at hand and even prepares the motor system for action. The RAS is engaged through both the auditory and movement components of iLs’ multi-sensory training.

Impacted Skills: ability to attend and focus, behavior