iLs INTEGRATED LISTENING SYSTEMS

HOW iLs INFLUENCES SENSORY PROCESSING

VESTIBULAR SYSTEM

Directly connected to the cochlea of the inner ear, the vestibular system is responsible for balance, coordination, muscle tone, rhythm and awareness of the body in space. It plays a key role in organizing motor output and posture. The vestibular system, along with proprioceptive inputs, also has a strong impact on attention and emotional regulation. Once these systems are functioning well, children and adults 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

PARASYMPATHETIC SYSTEM

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

PROCESSING SENSORY, COGNITIVE & EMOTIONAL INFORMATION

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

AROUSAL, SLEEP PATTERNS

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

PROPRIOCEPTION

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

LISTENING, CLASSROOM PERFORMANCE, SOCIAL SUCCESS

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. The goal is to train the ear and the brain to analyze and process sound more efficiently and accurately. 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.
Impacted Skills: pitch discrimination, auditory processing, spelling, mood, concentration, balance

READING, HAND/EYE COORDINATION

The subcortical visual motor system has direct neural connections to the auditory and vestibular systems. All three of these systems must work together for proper balance, coordination, reading and sound localization. iLs programs activate these systems with visual tracking and visual perception exercises; in fact, ocular motor improvement ranks as one of the consistently strongest areas of change resulting from iLs programs.
Impacted Skills: balance, coordination, reading and sound localization