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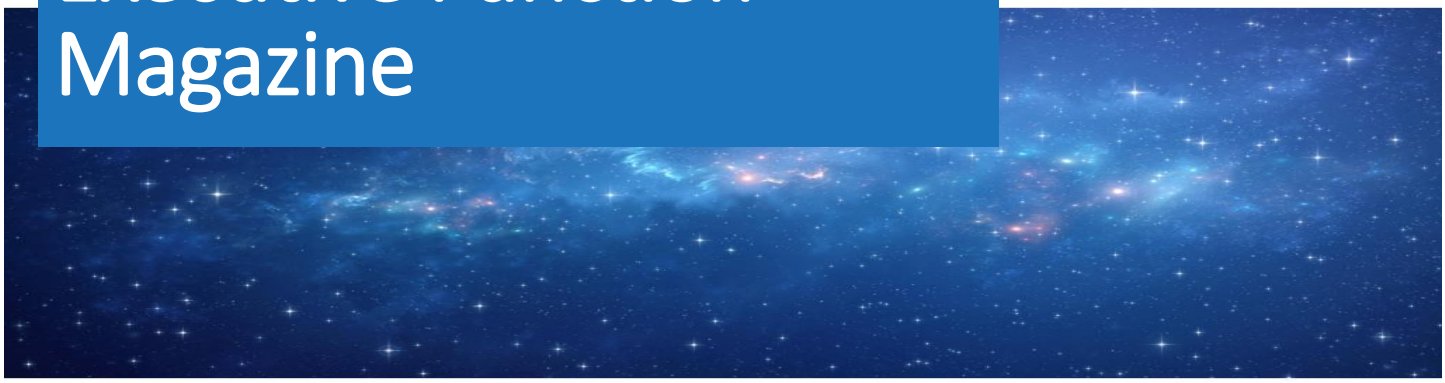

NEUROPLASTICITY

From a young age, children are taught the importance of physical exercise, movement, stretching and how to develop and perfect skills in countless sports. We have t-ball and youth soccer beginning in pre-school. As these children's skills develop, coaches and trainers rely upon cutting edge science - kinesiology, strength training, endurance and even diet - to most efficiently develop these players into the best prepared, most fit, psychologically ready teams they can. Yet, when it comes educating these same children, we rely on methods that have not significantly changed since the 1950s. And, the surprising fact is, we have the tools and the science that will make our students into the best prepared, most fit, psychologically ready students they can be.

Unfortunately, the science of neuroplasticity and the exercises that are used to make the brain work more efficiently are frequently treated as science fiction. The brain's ability to grow and change is considered by some to be misinformation promoted by charlatans preying on vulnerable families seeking help for their children. Let's stop and take a moment to honestly follow the science.

Neuroplasticity is the brain's ability to grow connections in a targeted manner. This work has been scientifically proven by Drs. Samuel Orton, Anna Gillingham, Alexander Luria, Mark Rosenzweig, Norman Doidge, Sally Shaywitz and countless other researchers for more than 100 years. Neuroplastic exercises target the foundation of our ability to learn. They are designed to target areas of cognitive weakness and build brain connections. The beauty of these exercises is that nothing happens in isolation. Thus, as neuronal connections are made in the targeted portion of the brain, the increase in connections and the increase in neurotransmitters effect adjoining brain areas. A more familiar example is how exercise targeting the biceps also effects the triceps, and muscles of the chest, shoulder and upper back.

My training in child psychiatry did not include neuroplasticity but rather relied upon the identification of learning disabilities and providing

BRAINS ARE CHANGING THROUGH NEURO-PLASTIC EXERCISE

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www.trainyourbrainmd.org

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accommodations. Learning disabilities were considered static and unchanging. Though some exercises were available, most children were asked to accept their cognitive weakness without question or an attempt to address it. The answer to learning challenges was accommodations.

Accommodations were considered to be the Holy Grail of the Americans with Disabilities Act but they are no panacea. They are in fact harmful since they deny the possibility of strengthening the brain to overcome learning challenges. Handing a child a calculator to solve basic math problems should be as reprehensible as placing a band aid over an abscess. In order to achieve an acceptable level of independence, one must have understanding of math. One must have a concept of greater than or less than. To avoid being victimized, one must have a concept of time and money. By not addressing the areas of cognitive weakness involved in learning to read, write or complete math, we are placing a cognitive ceiling on our children's abilities. This philosophy of passive acceptance of cognitive weakness ignores the dynamic potential of the brain to change and creates dependency and/or learned helplessness

Consider a child with neuromuscular delay. From an early age this child would receive intensive services in physical therapy and occupational therapy in order for them to learn to walk, balance, and coordinate their muscles, with the goal of bringing his skills on par with his peers. Similarly, a child referred to my psychotherapeutic practice will receive treatment which aids them in understanding that they are not defined by a moment in time or an obstacle in their path but are empowered to go beyond painful events. The contrast between empowerment through proper treatment and our education system's stiflingly regressive attitude regarding children with learning disabilities left me searching for alternative approaches.

Sometimes you have to hit a brick wall to change the way you are thinking. In 2007, I hit that brick wall. I suffered a major concussion in a serious car accident. The musculoskeletal pain was a reality but there was something more. My brain did not work. I was falling asleep as soon as I came home from work. I could not recall information. I was disorganized and life became a nightmare of missed appointments and details forgotten. However, I

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was a child psychiatrist. I would just use the proper accommodations until my brain started to work again. As my life unraveled, I recall saying, "I just want my brain back." Not long after this, I was given the book, The Woman Who Changed Her Brain by Barbara Arrowsmith Young. As I read the story of Barbara's life and the lives of countless students, I began to see hope not only for myself and my brain injury but for my patients who suffer with learning challenges.

Brain injury creates tearing or shearing of neurons in the brain, like broken wires in a computer. The data gets stuck because connections are lost. Would these brain exercises help me? Would they help the students I treat? These questions led me to contact the Arrowsmith School

in Toronto and become a certified Arrowsmith Instructor. As an Instructor, I have worked on many different exercises and have been witness to not only my own recovery but am able to witness in real time the growth of my students.

Barbara Arrowsmith Young is a remarkable woman who suffered from her own profound learning disabilities. In the midst of her struggle to learn she discovered the concept of neuroplasticity through the work of Alexander Luria and Mark Rosenzweig. She hypothesized that if their work is true, she could build a pathway out of the fog of cognitive weakness.

Her mission was a success. The first exercise she developed was Symbol Relations. In Symbol Relations one learns to tell time on an analogue clock. It is not, however, simply reading the face of the clock, but reading it with precision and speed and with reasoning and prediction. The exercise has incremental levels, so after mastering one level, the cognitive challenge increases. Students advance from reading a two-hand clock, then a three-hand, up to a ten-handed clock. As students progress through each level, the cognitive change begins to blossom. Students begin to read, comprehend, recall information, recognize cause and effect, and follow plot lines. The success of this Symbol Relations exercise led Arrowsmith Young to develop a total of nineteen exercises each targeting a different area of cognitive weakness. The Arrowsmith School opened in Toronto in 1980 and the program has grown across Canada, the United States, Europe, and Asia.

A good example of the need for educational change lies in this statistic; Twenty percent of the U.S. population suffers from some form of language-based reading difficulty or dyslexia. The fact that we are not incorporating the science of neuroplasticity into every classroom is a staggering failure of our educational system. Dyslexia is a complex learning profile involving multiple cognitive areas. Each student's education plan needs to be individualized to meet cognitive needs. Education plans must be targeted to address the specific areas of cognitive weakness not subject matter. Build the brain's ability and the academics will follow.

Neuroplastic brain exercises allow students to move beyond accommodations to independent learning. The degree of independence depends on each student's learning profile at the beginning of the exercises. Students with limited impairment will gain success rapidly, however, students on the Autism Spectrum or have other neurodevelopmental delays will make gains as well. These exercises can make the difference between a student living a life of dependency versus living a life of independence.

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The Arrowsmith Program is a facilitator mediated program that is offered at schools around the world and as part of my private practice. Students from age seven to adult are provided with specific targeted exercises to address their specific cognitive weaknesses.

This program provides the foundational structure on which students can learn. Each exercise builds and reinforces other exercises. There is a synergism and momentum that occurs as students gain cognitive strength. It begins slowly with students gaining basic memory and

relationship skills. As students begin making connections, the stress and anxiety of learning decreases, their self-esteem improves, and they begin to throw off the stigma that LD has strapped to their backs for years.

Now is the time for a neuroplasticity revolution. It is time for children and adults to take steps to train their brains, grow their cognitive capacities and begin to learn with ease. It is time for them to begin to comprehend not only the world in front of them, but the world that is beyond their reach, linking the capacity to hear and see, to memory, to comprehension and to full understanding, giving insight into what is beyond the present.

The Arrowsmith Program and its reach are dependent on mom's and dad's, teachers, psychologists, and psychiatrists, who are willing to take a leap of faith. Every day I witness students who are gaining skills that allow them to read, comprehend, write fluidly, attend to and recall information, speak fluently, and they begin to thrive rather than simply survive. Take a leap and build your brain.

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