

# Sportwall Fitness Promotes Brain Plasticity and Academic Learning

## Sportwall Conditioning for the Mind and Body – How it Works

Sportwall programs are multisensory, fitness programs for all ages and ability levels. In other words, visual, auditory, and physical tasks are integrated in performing the motor skills required. When it comes to localizing and tracking moving objects, it is likely that the human brain evolved to develop, learn, and operate optimally in multisensory environments. Thus, multisensory-training protocols can better approximate natural settings and are more effective for learning. This is accomplished by:

- Encouraging team participation and engaging sustained focus with short-attention grabbing computer games that are played sequentially to pursue mastery of skills and score
- Providing full body exercise by stimulating the hands, feet, eyes, ears, and vestibular system in playing real games with real sporting goods (not simulated)
- Requiring high levels of attention and focus for success (staying consciously “in-the-now”)
- Engaging in cognitive decision making under pressure
- Delivering a cardiovascular workout in a game format

## The Plasticity of the Brain – Physical Exercise Stimulates Cognitive Capacity



Brain science strongly supports the link between movement and learning. The brain and the body’s movement and learning systems are interdependent and interactive. For example, motor development provides the framework that the brain uses for academic concepts. Children who have developed fine motor skills through daily exploration and manipulation of a wide variety of objects also possess the cognitive foundations necessary to build academic success<sup>4</sup>. Neuroimaging techniques are revealing that certain motor tasks activate both motor and cognitive areas of a child’s brain<sup>4</sup>.

*“About eighty-five percent of school age children are predominately kinesthetic learners. Using movement in the learning process helps many children retain and retrieve information more efficiently. Physical activity prepares the brain for learning by providing a healthier body/brain that works more effectively. All things being equal, healthy active students can learn better.”* Jean Blaydes Madigan, Neurokinesologist, *Thinking on Your Feet*<sup>5</sup>. Of course, these physiologic principles

apply to adults.

In his groundbreaking book, *Brain Longevity*<sup>6</sup>, Dr. Dharma Singh Khalsa, M.D., reports that, “several researchers revealed stunning evidence that powerfully supports the efficacy of exercise in achieving and maintaining optimal mental function in people of all ages.” He also reports that exercise, when it is combined with thinking, is most valuable because it grows the largest number of dendritic connections.



Increasing evidence, including a recent study by the Baylor College of Medicine confirms that the brain itself operates like a muscle – atrophying from disuse and increasing in capacity with active use, even late in life. The brain thrives on stimulation. Unlike other organs that wear out after a certain number of years, the brain becomes sharper the more it is used. Physical exercise can increase cognitive capacity by driving blood and oxygen to the brain.

When the brain is engaged by having to make decisions under pressure while playing interactive ball sports, the benefits are enhanced significantly because the gross motor skills must

be incorporated. Neurons develop only when the player is confronted with a demand for greater efficiency (skill development). As far as the brain is concerned, if you need a skill, you develop it only when you are confronted with the need and then practice performing it.

The XerPro/XerTrainer makes training more fun while taking the brain-body connection to a level beyond typical sports in that the games are short, specific, more intense, and tuned to the appropriate level of difficulty until the student is ready for the next. Motivation to play for long periods occurs as a new score is established every few minutes.

Unlike other computer simulated games where a player holds a device and pretends to play by waving it around, the XerPro/XerTrainer engages the whole body in a real-play game with real sporting goods where the hands, feet, eyes, ears, and vestibular system are all involved in the activity. This produces a computer generated score which measures actual athleticism, cardiovascular fitness, and intellectual agility.

The value of the computer generated games is that successive demands at each level of difficulty are randomly produced. This requires the player to stay “in-the-now”, ignoring any internal or external distractions in order to prepare for the next challenge. Profound focus on the present, allows the XerPro/XerTrainer programming to target development of all five core

brain areas:

- Memory (Short Term/Long Term)
- Speed, Accuracy, Reaction Time
- Attention/Focus
- Problem Solving
- Cognitive Agility

Sportwall programs are also designed to encourage right and left brain intelligence and balance as the participant is directed to perform movements that develop the corpus callosum, the super highway of connective motor and sensory axons that connects the two hemispheres of the brain. In fact, movement is essential to the development of all four lobes of the brain. The more both hemispheres and all lobes are activated by use, the more dendritic connections form and extend across the corpus callosum and myelinate. The more myelination, the faster the processing is between both hemispheres and all the lobes of the brain, and the more intelligently we are able to function. It is necessary to use both hemispheres of the brain to be maximally proficient at anything or produce whole brain thinking.

*“Research indicates that when both eyes, both ears, and both feet are being equally used, the corpus callosum (responsible for the whole brain processing) orchestrating these processes between the right and left hemisphere becomes more fully developed – cognitive function is heightened and ease of learning increases.”* Dr. Carla Hannaford, Neurologist, *Smart Moves*.

### **Pulling It All Together**

While it can be argued that many of the components discussed in this document can be fulfilled with other programs and training equipment, there is nothing that compares with the Sportwall XerPro and XerTrainer in several significant areas. First, programming is extremely diverse and caters to all population groups from children, to seniors, from athletes to children with special needs. Second, the programming does not discriminate with regard to skill level as it meets players at their ability level. Finally, and most importantly, these are programs that have mainstream appeal and are able to break down the barriers and engage the traditionally inactive.



Because the structure of the programming involves multiple short games played in teams, there are no permanent winners. Instead, the chance for everyone to succeed is repeated every

couple of minutes which incentivizes continual play. Group and team play format creates a high level of camaraderie and the combination of rapid skill development along with social connection leaves players on a positive note after the class. Of particular interest is the fact that computer gamers sense no barriers to overcome as they see their activity as a game rather than a workout or something done only by “jocks.”

### **What people are saying about XerPro and XerTrainer:**

*“Most noticeable to me was that the less skilled participants got the most encouragement from their team members and showed the most improvement in both skills and attitude. It definitely improved their self esteem and motivated them to work hard and do their best.”* Karen Perry-Kaplan, Physical Education Teacher, Schoefield Elementary, Wellesley MA

*“Students love this equipment and have so much fun they don’t even realize how much exercise they are doing. I give Sportwall my highest recommendation and commend the designers of this cutting-edge equipment for new hope in the fight against childhood inactivity/obesity.”* Dr. Wayne L Wescott, PhD., CSCS, Fitness Research Director, South Shore YMCA

*“XerPro is a technological marvel! It makes training as much fun as an actual match through exciting interactive, virtual competition. It’s computerized, lighted targets get you to focus and hit your spots - just like in match play! With XerPro players are getting cardiovascular fitness, sports training and they are having fun at the same time! It’s a great way to get today’s young computer game players off the couch and exercising again. XerPro is truly a blast!”* Billie Jean King

### **References/Bibliography**

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