

### ***Maladaptive Behaviours Related to Brain Balancing***

In trying to satisfy their need for brain central coherence, individuals experiencing problems associated with brain balancing may behave in reactionary and cognitively unintended ways. They may:

- become angry. Anger stimulates the brain to focus and in so doing organizes the individual's thoughts, and therefore offers the individual relative calm. For everyone, anger is a much less painful emotion than fear. Thousands of incidents like this throughout the individual's lifetime have taught them that this response is effective, so the subconscious mind continues to repeat this behaviour until it is no longer required;
- obsess and become compulsive. These behaviours organize the individual's thoughts, create focus and therefore calm the individual;
- blame and even hit others. This is one way that the individual can self-medicate with anger. These behaviours are magnified by a supporter's mindless fear and unknowing powerful communication of that fear.

### **Brain Facts to Enhance Brain Coherence and Functioning and Reduce Challenging Behaviours**

The proven potential for brain development and enhanced functioning is sadly possibly the least appreciated and understood fact regarding needs in supporting PwDD to be all that they can be.

Through proven training and maintenance of a healthy brain (e.g. inflammation prevention) enhanced brain functioning is possible as a result of development in the following area:

- Neurochemicals Production e.g. endorphins, oxytocin, neurotransmitters like dopamine (pleasure) and serotonin and GABA (calming). Reference J. Ratey and R. Mann 2014;
- Neurogenesis i.e. promotion of the growth of new neuron cells (reference Mayo Clinic Ahlskog JE, et al. 2011) (D. Siegel, *The Mindful Brain*);
- Neuroplasticity i.e. the reformation of neuron networks to take on new and extra 'tasks' (reference Doidge, N., *The Brain That Changes Itself* and *The Brain That Heals Itself*);
- Neurostimulation
  - Promoting Motor Function by Exercising the Brain (reference Brain Science 2013, Mar:3 (1) 101-122).
  - Transcranial Magnetic Stimulation (reference Eagleman, David, *The Brain* pages 94-95).

# **Aerobic Exercise to Enhance Brain Coherence to Develop Emotional Self- Regulation**

## **Basic Facts**

The human energy system must be regularly fueled by aerobic exercise (as recommended by the primary care physician).

Dr. John Ratey says that aerobic exercise is *miracle grow* for the brain. Exercise and movement are essential pieces of any human energy system's well-being program.

As discussed above, many aspects of a fulfilling life are dependent on a fully turned-on medial prefrontal cortex (MPFC) in the brain. The MPFC was developed by our ancestors who ran and sprinted fifteen miles every day. It's not surprising, then, that aerobic exercise is essential for cell organization and brain coherence because it activates the MPFC.

Aerobic exercise is defined as physical activity that brings the heart rate up to training level, which is calculated by subtracting one's age from 220, and taking 75% of that number to determine the optimal beats per minute during exercise ( $220 - \text{age} \times 75\% = \text{optimal beats per minute}$ ). As a person exercises, electromagnetic energy in the brain increases to the levels necessary for optimal functioning. This desirable level of functioning includes improving organizing signals, focussing, evaluating consequences, delaying responses, increasing memory and growing brain cells.

The growth of brain cells occurs because aerobic exercise stresses and even destroys some neurons and this helps the brain to regenerate more, better and stronger cells. The process is similar to the result of exercising muscles to make them grow stronger. Through aerobic exercise, millions of new brain cells are developed.

Exercise also controls the fear reactions of the autonomic nervous system (ANS) that lead to responses of flee, fight or freeze and the resulting problematic behaviours. Exercise elevates the functioning of neurotransmitters such as dopamine, the happy hormone, and produces natural painkillers such as morphine and cannabis—the feel good drugs.

Another factor influenced by exercise is the presence in the brain of a substance called Atrial Natriuretic Peptide (ANP). Aerobic exercise significantly raises the levels of ANP and avoids the detrimental effect of blocking ANP, which can in turn induce panic attacks.

## **Supporter's Optimal Solutions to Help a PwDD with Aerobic Exercise**

- Aim for twenty minutes twice a day of aerobic exercise;
- Establish a walking speed similar to someone in a hurry;
- Include balancing movement such as exercise on a mini-trampoline to activate and grow the cerebellum, therefore amplifying the operations of the prefrontal cortex;

- As approved by a physician, use interval training twice a week. The pattern could be 20 seconds intense exercise followed by 10 seconds of rest repeated for 4 minutes.

Doctors Ratey and Manning in 2014 proposed that exercise improves all brain learning in the following ways:

- Increase attention, less fidgety, less impulsive;
- Causes over 100 billion brain cells to be better nourished by neurotransmitters, growth factors and hormones that wire in memories more easily;
- Grows new brain cells.

According to (Oriel et al. 2011) vigorous exercise for 20 minutes or longer for 5 times a week reduces maladaptive behaviour.

A recent study (Piochon et al. 2014) shows that the cerebellum – the motor and coordination centre of the brain is not functioning well in many children with Autism. Exercises such as bosu bouncing strengthen the cerebellum.

### **Supporter's Optimal Solutions - Brain Balancing and Coherence**

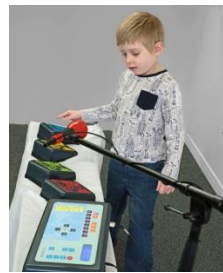
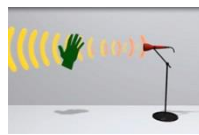
- Use stabilizing and bosu balls, balance beams and cushions to increase brain cerebellum activation and therefore improve brain energy balance and coherence. The cerebellum, one of the most common sites of anatomic abnormalities in ASD, is particularly implicated in problems with connectivity and coordination of cognitive functions. Stimulation of the cerebellum through bouncing and balancing exercises significantly improves the brain's energy system. This improvement seems to bring less confusion, more coherence and cognition, and therefore less maladaptive behaviour.

*"A review by the Mayo Clinic (Ahlskog et al 2011) demonstrated that of more than 1600 scientific papers on the effectiveness of exercise and cognition, there was profound positive effect of exercise on keeping our brains growing rather than eroding with age, making us smarter and allowing us to use our brain most effectively."*

Dr. Theresa Hamlin - Autism and The Stress Effect



*Rebounders give critical stimulation for healthy brain functioning do in part to activation of the cerebellum.*



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