

BRAIN CHEMISTRY/FUNCTION & ADD/ADHD

Book Notes from Dr. Daniel Amen, Change Your Brain, Change Your Life and Dr. John Gray, The Mars & Venus Diet & Exercise Solution: Create the Brain Chemistry of Health, Happiness, and Lasting Romance

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The brain is involved in everything we do. How we think, feel, learn, work, and love stems from the actual moment-by-moment function of the brain. When the brain works right, we tend to work right. Protecting and optimizing brain function is essential to helping people be the best they can be. There are many ways to optimize brain function, including proper use of supplements, vitamins, and medications; proper diet and exercise; decrease in stress (stress hormones damage brain function); and enhancement of relationships. (Dr. Amen, forward to Dr. Gray's book)

ADD/ADHD

The common symptoms of ADD or ADHD are all associated with an **underactive prefrontal cortex and a deficiency of dopamine**. The prefrontal cortex occupies the front third of the brain, underneath the forehead. (Gray, p. 43) ADD occurs as a result of **neurological dysfunction in the prefrontal cortex**. Through the SPECT research done in my clinic, along with the brain imaging and genetic work done by others, we have found that ADD is basically a genetically inherited disorder of the prefrontal cortex, due in part to a **deficiency of the neurotransmitter dopamine**. (Amen, p. 116-17) The end result of a nutritionally deficient diet is that males often have a dopamine deficiency. One out of every five boys is diagnosed with ADD/ADHD and 90% of the millions afflicted with the disorder are boys. This disorder is a national epidemic. (Gray, p.46-47)

1) Functions of the Prefrontal Cortex (Amen, p. 111)

- attention span
- perseverance
- judgment
- impulse control
- organization
- self-monitoring and supervision
- problem solving
- critical thinking
- forward thinking
- learning from experience
- ability to feel and express emotions
- interaction with the limbic system
- empathy

2) Problems with the Prefrontal Cortex (Amen, p. 115)

- short attention span
- distractibility
- lack of perseverance
- impulse control problems
- hyperactivity

- chronic lateness, poor time management
- disorganization
- procrastination
- unavailability of emotions
- misperceptions
- poor judgment
- trouble learning from experience
- short-term memory problems
- social and test anxiety

3) Characteristics of ADD/ADHD (Amen, p. 116-122)

- The harder you try, the worse it gets
- Short attention span
- Distractibility
- Impulsivity
- Conflict seeking
- Disorganization
- Start many projects, but finish few
- Moodiness and negative thinking

4) Dopamine & ADD/ADHD

Children with **low dopamine** and an underactive prefrontal cortex tend to be easily bored and seek out stimulation from new and different sensations and experiences that create an immediate response. They can easily give attention to something that engages them. Mothers and teachers often complain that their children don't listen and tend to do what they want to do rather than consider the needs of others. When required to focus on something that doesn't seem relevant or to the point, their brains begin to shut down. They often seek immediate gratification, require extra stimulation, and lose interest very quickly. With increasing attempts to focus, these children **deplete dopamine supplies** and demonstrate symptoms ranging from boredom, tiredness, and restlessness to hyperactivity, impulsiveness, and disruptiveness. (Gray, p.44)

5) Putting it all Together

With more dopamine available, the brain begins to function normally and the prefrontal cortex becomes more active, even with brain damage. With increased dopamine, the patient experiences to different degrees a surge in clarity, pleasure, energy, and motivation. A brain fog lifts, and the sometimes indefinable flatness of boredom is forgotten as a person is suddenly much more interested in responding to the needs of others. With the help of dopamine, a person suddenly has a renewed sense of meaning and purpose. (Gray, p.44)

When there is a nutritional deficiency, an imbalance in brain chemistry results. (Gray, p. 43) Without the right diet and exercise, a healthy brain is unable to synthesize adequate amounts of neurotransmitters (such as dopamine & serotonin), and as a result it appears as if it has been damaged. Research reveals the importance of certain amino acids to produce correct brain chemistry. The practical application of this research is called **activated amino acid supplementation**. (Gray, p. 308) Healthy liver function (nontoxic) is also essential in processing of amino acids into healthy brain chemistry. (Gray, p. 106) The liver actually breaks down proteins into amino acids to produce

dopamine and serotonin or it can more easily take ingested amino acids to produce them. In addition, our cells are starving and our brains are not producing healthy brain chemistry because the foods we eat are deficient in minerals. **Minerals** are vital to our overall mental and physical well being and they work as **a factor to synthesize the production of brain chemicals such as dopamine.** (Gray, p. 182-83)

6) Practical Nutritional Applications

- The brain produces the next day's supply of dopamine in the two hours before midnight, so get to bed early!(Gray. P. 27)
- Dr. Amen recommends a high protein, low carbohydrate, low fat diet; eliminate simple sugars and carbohydrates; refined carbohydrates have a negative impact on dopamine levels in the brain and concentration(Amen, p. 148-48) To produce more dopamine, you need to be careful with high glycemic foods. Not only do they lessen production of brain chemicals but they will produce a serotonin spike which lowers male dopamine levels. (Gray, p. 257)
- Abundant research demonstrates various kinds of **amino acid supplements** help children with ADD & ADHD. (Gray, p. 20) To produce dopamine, the body needs nourishment provided by amino acids. Have a **healthy nutrient dense breakfast shake** containing carbohydrates, protein powder, flaxseeds for omega 3 fatty acids, enzymes, vitamins, ionic plant source minerals, water & ice (Gray, p. 210-14) OR Isagenix brand Isalean Shakes. (containing **18 natural amino acids**) This can replace breakfast or supplement a light healthful breakfast. **Repeat the shake in the evening** for better results since dopamine is produced from 10pm-12 midnite.
- Eat **dopamine producing foods** (Gray, p. 257-260) or high protein low fat foods: Top 20 are egg whites, whey, adzuki/kidney/lima/mung beans, crab, cod, flounder, skim milk, abalone, lobster, clams, black beans, low fat cottage cheese, shrimp, sea bass, turkey (light), halibut, spirulina, chicken (light), refried beans, Wheatberry English muffin
- In addition to amino acids provided by proteins (or amino acid supplements), need **good fats** for the production of dopamine; **omega 3 fatty acids** found in flaxseed oil, about ½ tablespoon daily for males. Dietary sources would be avacado, walnuts, fish such as tuna, salmon, mackeral, cod, pumpkin seeds, soybeans, kidney beans, flaxseeds & oil, hemp seeds & oil, cod liver oil, sea vegetables as nori, hijiki, & kombu. (Gray, p. 260-61)
- **Cleanse your liver** so it can function properly and produce/process the amino acids which make dopamine. Have a **morning cleansing drink** containing trace minerals, aloe vera, lemon juice, & honey OR Isagenix brand Fast Start Drink (containing 70 organic plant source trace minerals and pure aloe vera juice) If you strengthen your digestion with enzyme supplements and drink minerals and aloe vera to cleanse the liver, your body can more effectively digest proteins and fats so that the liver can process and convert amino acids into healthy brain chemistry.(Gray, p. 21)
- Dr. Amen recommends the following **nutritional supplements**: tyrosine(amino acid), grape seed or pine bark, ginkgo biloba ,helps increase dopamine and blood flow to the brain (Amen, p. 148-49)
- Research has shown **regular exercise** decreases dopamine-deficiency symptoms as ADD & ADHD. (Gray,p. 98)

7) Notes on Prescription Medications

- Medications that help ADD such as the psychostimulants Ritalin, Dexedrine, or Adderall work by enhancing the production of the neurotransmitter dopamine . (Amen, p. 84)
- Common side effects of Ritalin include: nervousness, insomnia, Tourette's disorder, palpitations, tachycardia,; prolonged therapy associated with growth suppression, children attain normal height when drug discontinued, many other less common effects (Nursing94 Drug Handbook)
- Abundant research demonstrates that various kinds of **amino acids supplements** help children with ADD and ADHD, symptoms began disappearing, such products were an **alternative to such prescription drugs as Ritalin.** (Gray, p. 20-21)
- It takes time for the brain to adjust and to produce healthy and balanced levels of dopamine on its own. By following the nutritional and exercise applications you will give your brain the help it needs to begin producing healthy brain chemistry without usual withdrawal symptoms. **Feed your brain what it needs before going off drugs.** You need to be under the **supervision of a medical doctor** who is informed about the side effects and will monitor your changing symptoms. (Gray, p. 108)