ATTENTION DEFICITS CAUSES AND CURES

As early as 1937, stimulants were found to have calming effects on disruptive behavior. Although this ultimately led to the widespread use of medications such as Ritalin to treat hyperactivity (ADHD), it did not explain the paradox of stimulants slowing down children who were constantly in motion. The advent of brain imaging technologies in the 1980s began to make sense of the mystery with a surprising discovery.

> The frontal cortex (surface) of brains of people with Attention Deficit Disorder (ADD) and ADHD were found to have more difficulty using glucose (blood sugar) and to have less blood flow than the frontal region of people without ADD.[1]

PHYSICAL CLUES LEAD TO CURES

The above finding gives new meaning to other well-known facts. Thoroughly understanding these helps make sense of treatments for ADD and strategies that minimize it:

1. The prefrontal cortex (a) inhibits impulses, (b) initiates behavior, and (c) controls working memory. Underactivity in the cortex would reduce the ability to:
   - Inhibit movement and screen out irrelevant stimuli, which might be thought of as an ability to attend to everything rather than a "lack of attention."
   - Regulate the motivation system, causing staying on task to be difficult without constant rewards, and explaining why video games that provide rapid and constant feedback are very engaging for people with ADD.
   - Automatically control concentration, causing people to compensate by learning to overconcentrate, which makes it difficult to let go of enjoyable tasks.
2. Dopamine and norepinephrine, the body's natural stimulants, are abundant in the prefrontal area of the brain. An underactive cortex may (a) be less able to use these chemical messengers, or (b) have fewer dopamine neurons that connect the lower brain to prefrontal cortex. It may be a lack of input from the brain stem that decreases energy in the frontal cortex. Therefore:
   - Constant motion and risk taking may be an attempt to energize the brain.
   - Stimulants could be an effective treatment because they increase levels of dopamine and norepinephrine. Antidepressants, which increase the activity of norepinephrine, would give an additional boost to a "sluggish" cortex.
4. Slow brain waves seen in deep sleep (when less energy is being used) dominate the waking states of people with ADD. As children age, low-frequency (slow) brain waves decrease and the cortex becomes better regulated. "Low-energy" brainwaves (measured by EEG) in people with ADD may be further evidence of decreased blood flow and glucose use in the cortex. EEG biofeedback training claims to help people eliminate problems with ADD by increasing higher frequency (alert) brain waves.[2]
5. Decreased blood flow in the right hemisphere is also detected by brain imaging in some people with ADD. This side of the brain manages cause-and-effect relationships, spatial perception, and decision making. An underactive right hemisphere may cause trouble with seeing the whole picture, poor spelling, getting lost or losing things, and difficulty adapting to unexpected situations.

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[1] Statistics and information on the physiology of ADD from Driven to Distraction by Edward Hallowell and John Rately (Simon & Schuster, 1994).

[2] For further information on EEG training, contact EEG Spectrum, 16100 Ventura Boulevard, Suite 10, Encino, CA 91436-2595, www.eegspectrum.com.

6. Heredity appears to account for some of the physiological and maturation differences between people with and without ADD. A particular combination of genes creating the full syndrome is strongly suggested by statistics. At least 30% of parents of ADD children have (or had) the disorder themselves. Only 4% to 6% of the general population has ADD. Fetal exposure to lead, alcohol, cocaine, or nicotine could also be factors.

TREATMENT FOR ADD

In mild cases, people can learn to manage ADD symptoms by learning behavioral strategies. However, failing to consider medication for people who may have an energy shortage in the brain cortex can handicap school or work performance. Stimulants reduce symptoms in 75% to 80% of people with correct diagnoses. Although their effects are immediate, it can take months of trial and error to determine the right dose. Certain antidepressants help approximately 70% of those who do not respond to stimulants. Other drugs also help ADD or increase the effectiveness of medication:

Medication for ADD	Side Effects and Benefits
Stimulants: • Ritalin, Dexedrine, and Adderal increase the body's natural stimulants dopamine and norepinephrine. Effects start within 30 minutes and can last 5 hours. Time-released forms may last 8 hours. • Cylert takes several weeks before benefits are seen but effects are long-lasting.	• Increase blood pressure and heart rate, decreased appetite, sleeplessness, and aggravation of any tics. Initial headaches and nausea usually pass. Suppression of growth is rare. • Can affect liver functioning and may not be as effective as other stimulants.
Blood pressure medication: • Corgard and Inderal are beta blockers. • Clonidine (Catapres).	• Decrease jittery side effects of stimulants. • Reduces impulsivity and may help sleep.
Antidepressants: • Norpramin and Tofranil increase norepinephrine, which increases brain energy. • Wellbutrin (bupropion) may work by increasing norepinephrine and dopamine.	• Dry mouth, holding urine, heart arrhythmia in high doses. Low doses often work well. • Agitation, stomach distress, headaches, or sleep problems rare when dose is correct.

MEDICATION GUIDELINES

- Start with the minimal dose and increase in small increments until benefits are seen. Responses vary greatly. Some people need much more or less than the usual amount.
- A "rebound effect" of irritability is seen in 30% of people taking stimulants as medication wears off. Smaller doses in the afternoon or time-release formulas can reduce this.
- Have a trial of both Ritalin and Dexedrine to see which is the more effective (10 mg of Ritalin = 5 mg of Dexedrine). Once the correct dose is set, time-release forms can be tried.
- Use "drug holidays" for a week every 6 months to find out if medication is still needed. Stopping drugs over the summer gives children time to catch up on any (rare) growth loss.
- Others may notice improvement in behavior before people with ADD do.
- Stop stimulants immediately if tics are noted and try antidepressants. Antidepressants are also helpful when moodiness or poor social skills accompany ADHD.