



Focusing on A.D.D

Adults and children living with Attention Deficit Disorder know the daily struggles of hyperactivity, social isolation, and drug side effects. But yoga may help control these symptoms as well as reduce long-term dependency on medication.

By Fernando Pagés Ruiz

When 8-year-old Clayton Petersen began taking yoga, he had a hard time staying focused. He would assume a posture and then get distracted. His teacher, Kathleen Randolph, had to recapture his attention about once every minute, guiding him back to the center of the room and then into the next asana. She recalls these first lessons, staged within the confines of her small basement studio, were "like being inside a pinball machine." Clayton bounced from wall to wall, scattering his considerable energies throughout the studio in a way any parent of a hyperactive child with Attention Deficit Disorder (ADD) would immediately recognize.

The clinical label ADD describes one of the most commonly diagnosed behavioral impairments of childhood, affecting an estimated 3 to 9 percent of the school-age population and 2 percent of adults. While most outgrow their hyperactivity in adolescence, about two-thirds carry other symptoms like distractibility into adulthood.

ADD's core symptoms include inattention, difficulty following directions, poor control over impulses, excessive motor activity in many but not all cases, and difficulty conforming to social norms. But low intelligence is not among these, despite the fact that ADD can hamper learning. On the contrary, a great majority of those diagnosed enjoy above-average intelligence. Bonnie Cramond, Ph.D., associate professor of education at the University of Georgia, authored a provocative paper comparing the symptoms of ADD with creativity. She found that children diagnosed with ADD share traits with such innovators as Robert Frost, Frank Lloyd Wright, and Leonardo DaVinci.

Since the 1940s, psychiatrists have used various labels to describe children who seem inordinately hyperactive, inattentive, and impulsive. These labels have included "minimal brain dysfunction," "hyperkinetic reaction of childhood," and, since the 1970s, "Attention Deficit Hyperactivity Disorder" (ADHD). But it turns out that certain children are inattentive and easily distracted without being hyperactive. These quiet, spaced-out kids don't disrupt class and often go unnoticed. Today the simpler label Attention Deficit Disorder has gained favor to acknowledge attention deficits that come with or without hyperactivity.

For decades, doctors blamed ADD on bad parenting, character weakness, refined sugar, and a host of other causes. Recent research, however, using sophisticated brain-scanning technology suggests a subtle neurological impairment. Studies report that several brain regions in ADD appear underdeveloped, most notably the right prefrontal cortex—an area of the brain associated with inhibition. It turns out that inhibition acts as a precursor to concentration.

One's ability to concentrate emerges from restraining mental distractions in a process neurologists call "neural inhibition"—a description that squares with Patanjali's definition of concentration as "quieting the mind of its compulsions." Here's how it works: As you read this sentence, your brain intensifies the neural circuits related to language by suppressing competing stimuli like ambient sounds, peripheral vision, and extraneous thoughts. The contrast created between the circuits highlighted and those inhibited allows you to focus your concentration. In the ADD brain, the inhibiting portion of the system malfunctions. ADD brains get flooded with competing stimuli and lack the means to sort them out; each internal voice shouts as loudly as the others.

Looking for a New Drug

Understanding what causes ADD is child's play compared with knowing how to treat it. There is no cure, so learning how to control the condition is the focus of treatment. And when it comes to ADD treatment, medication has long been accepted as the best medicine.

Stimulant drug use for hyperactivity dates to 1937, when Charles Bradley, M.D., discovered the therapeutic effects of the amphetamine Benzedrine on behaviorally disturbed children. In 1948, Dexedrine was introduced and shown to be just as effective, without such high dosages. This was followed by Ritalin in 1954. Ritalin had fewer side effects and, since it's not an amphetamine, less potential for abuse. It soon became the best-known and most prescribed psychoactive drug for ADD children—as well as the most scrutinized: By now hundreds of studies have backed its safety and effectiveness.

But nowadays, Ritalin has taken a back seat to generic versions of methylphenidate—Ritalin's active ingredient—and ADDerall. A "cocktail" drug of amphetamines, ADDerall offers greater dosage flexibility, works more gradually and on a broad spectrum of symptoms, and eliminates the peaks and valleys of methylphenidate.

Still, these drugs are what continue to make ADD treatment controversial. The greatest fallouts with any stimulant medication are lifelong dependency and possible side effects from such long-term use. General use of ADD drugs can trigger some immediate reactions, such as loss of appetite, insomnia, weight loss, delayed puberty, irritability, and the unmasking of latent tics.

Yet these symptoms are said to be manageable with dosage modifications or by discontinuing the use of medication. And although several studies have shown most side effects are mild and short-term, many researchers add that there are insufficient long-term studies to confirm the safety of these drugs over an extended period.

Then there is the ongoing debate regarding the effectiveness of ADD medication beyond a certain time frame. Enid Haller, Ph.D., a specialist in ADD and director of Behavioral Arts in New York City, considers psychopharmaceuticals a short-term intervention at best. "These drugs stop working after six months to a year, and you have to switch medications or change the dosage," she says. "Unless the individual with ADD learns to compensate for their deficiencies and exploit their mental strengths, medication alone won't help in the long term."

Today, more health-care professionals recommend a multidisciplinary, multimodal approach to the treatment of ADD, which includes medication but also therapy and dietary changes as well as a host of mind-body approaches, such as biofeedback, neurofeedback, and yoga. These treatments work to help ADD sufferers learn how to control their symptoms and relieve both emotional and physical stress. But as is the case with most complementary treatments, lack of scientific evidence keeps them from being more accepted and widely used. They tend to get stuck in a gray area: Either they have strong testimonials but no clinical trials to support them, or they have encouraging preliminary research to back their claims but no follow-up studies.

Take EEG neurofeedback and EMG biofeedback, for example. EEG (electroencephalography) represents a computerized training that teaches children how to recognize and control their brain waves. Researchers have observed that those with ADD have higher rates of theta waves (associated with low stimulation, dreaming, and inattentiveness) and lower rates of beta waves (associated with concentration and attention). A computer game controlled by the production of beta waves teaches children the "feel" of a beta wave state until they can eventually reproduce it at will.

In one controlled open trial led by Michael Linden, Ph.D., in 1996, children with ADD showed a 9-point IQ increase over a 40-week period using EEG. EEG appears to work best for inattentive ADD children, but it involves undergoing many sessions and can be expensive, at a cost of about \$50 per session. However, on the plus side, there are no adverse physical or psychological side effects.

EMG (electromyography) works similarly to EEG, except it trains deep muscle relaxation instead of brain waves. When muscles relax to a desired degree, a computer generates a tone. By learning to control this tone, subjects can learn deep relaxation. This treatment is not as popular as EEG, but substantial scientific literature supports its effectiveness. It also represents an important therapy because it works with the most troublesome group of ADD sufferers, hyperactive boys. A study published in *Biofeedback and Self-Regulation* (1984; 9:353–64) found junior high hyperactive boys attained significantly higher reading and language performance after just six 25-minute EMG-assisted relaxation sessions.

Another study, published in the *Journal of Clinical Psychology* (1982; 38:92–100), which focused on hyperactive boys aged 6 to 12, found significant improvement in behavior observations, parent ratings, and psychological tests after 10 relaxation training sessions. But this data also revealed something interesting: The effect of EMG biofeedback closely resembles the type of neural relaxation work that occurs in yoga. Why is this important?

Some experts now believe a combination of physical and mental discipline may be the best approach in treating ADD safely and effectively for the long term.

According to John Ratey, M.D., coauthor of *Driven to Distraction: Recognizing and Coping with Attention Deficit Disorder from Childhood Through Adulthood* (Simon & Schuster, 1995), exercise that integrates both the body and mind engages the attention system more readily than meditation alone. "[Many studies have shown that] the greatest yield of nerve growth factors happens when the body engages in complex movement patterns," says Ratey.

The Yoga Connection

It's important to realize, though, that while yoga may help those with ADD, it is not a miracle worker. It requires time and discipline—concepts that can be difficult for those with ADD to master. In many cases, it takes a year or more for the effects of yoga to make any difference, while medication works in minutes. But the benefits of medication wear off along with the prescription. The effects of yoga—which include suppleness, poise, and better concentration—are much longer lasting: They develop gradually through a type of learning that transforms the entire person. There is no learning or transformation involved in taking a pill.

Mary Alice Askew can relate to this. She learned she had ADD in high school, and like many girls, her symptoms did not include hyperactivity, which made the diagnosis less obvious but no less debilitating. A bright, capable student, her grades and social relations did not match her potential. Though she studied diligently enough to get straight A's, she instead got C's and D's. During class, Askew reeled between two extremes, either "spaced-out or hyperfocused, with no happy medium," she says.

With her attention system out of control, the transitions from one class to the next were especially hard. Unable to switch activities without getting "mentally disorganized," she felt inadequate and confused. She knew she could perform as well as her peers, but something got in her way.

To determine what, her parents arranged for a battery of psychological tests that led to the diagnosis of ADD. Treatment began immediately, with stimulants for mental clarity and behavioral training to help her get organized. Her symptoms and grades improved, and she went on to college.

Askew thought she would remain dependent on psychopharmaceuticals for life, but a sudden twist of fate brought her to yoga—a breakthrough that redefined her personal therapy and eventually her career. She discovered yoga in her early 20s, after a car accident left her body wracked in pain. Her physical therapist recommended yoga as part of a comprehensive pain management program. She began to study with her physical therapist and also began to practice at home for up to 90 minutes every day.

The asanas helped reduce her pain and yielded a surprising side effect: Her symptoms of ADD improved too. "I noticed that standing postures put me into the perfect mental state

for listening and learning," she says. So Askew began standing in [Tadasana \(Mountain Pose\)](#) at the back of the classroom. "It gave me something to do with my energy, besides fidgeting," says Askew. "It helped me stay in the academic moment."

After graduating with a master's degree in counseling, Askew began treating students with ADD at a public school in North Carolina. She taught them yoga and meditation to prepare for exams. Today, Askew works as a hypnotherapist and incorporates yoga into her work at Haller's Behavioral Arts and Research Clinic in New York City. She says yoga provides several benefits for those with ADD:

- **SELF-AWARENESS.** People with ADD lack it, notoriously underreporting their own symptoms. The ADD brain, struggling with an overload of sensory stimuli, lacks the mental space for introspection. By emphasizing physiological self-perception, yoga strengthens self-awareness, which can represent the first step in self-healing. "I used to feel hyper-aware of everything but myself," says Askew. "But yoga helped me get comfortable within my own skin."
- **STRUCTURE.** Many with ADD leave considerable creative potential unfulfilled because they can't seem to organize their creative energies. Therefore, positive, life-enhancing routines that establish order can be a very important part of ADD management. Systematic patterns of movement help organize the brain. A highly systematized approach, like Ashtanga Vinyasa Yoga, for example, provides consistent, reliable patterning along with the progressive challenges that ADD people require to sustain long-term interest in an activity.
- **COORDINATION & PHYSICAL FITNESS.** Children with ADD frequently miss out on physical education—not because of physiological limitations but because their inability to "play by the rules" makes them anathema to coaches and unpopular with their peers. Consequently, ADD kids don't develop the same level of physical coordination as other children. Therapists often recommend martial arts for their ADD patients because it offers a disciplined, athletic outlet without the pressures of a team sport. Yoga, though, goes one step further, providing physical fitness without competition. The relative safety of yoga allowed Askew to explore her body and gain a sense of physical self-confidence, thus shedding the feeling of awkwardness she'd suffered most of her life. "Having my posture in alignment makes it easier to move in a fluid way, shifting attention without stress," she says.

One Child's Class

It takes a special yoga teacher to work with ADD kids. "The teacher must have access to a variety of specialized techniques for dealing with anger, distractibility, and impulsivity, as well as a solid foundation in yoga," says Sonia Sumar, author of *Yoga for the Special Child* (Special Yoga Publications, 1998). Sumar trains and certifies yoga teachers, like Randolph, to work with developmentally challenged children. Randolph combines Sumar's special education approach with 30 years of hatha yoga practice in her classes with Clayton.

She works patiently, often one-on-one for several months, before integrating a child with ADD into a group setting, which includes two or three kids at the most. "These kids can be very intense," says Randolph. "A yoga teacher who works with children with ADD must develop patience, boundless energy, and a keen focus herself. These children need someone who can think faster and more creatively than they do; otherwise, they soon get bored."

Every Thursday, Clayton steps into Randolph's studio at The Yoga Center in Reno, Nevada. "Sometimes it's a struggle to get him there," says his mother, Nancy Petersen, "but in the end, he's always glad he went." Children with ADD struggle with transitions, so Randolph enlists a brief ritual, including candles and incense, to help Clayton shift into yoga mode. The structure of Clayton's classes generally follows the same basic pattern every week, with a few alternating poses chosen for variety.

ADD children do best in a well-organized environment, as their internal sense of structure lacks coherence. The Yoga Center has a sunny room with large windows and mirrored walls, but Clayton's classes take place in Randolph's basement studio, where the ivory-yellow paint and sienna carpet keep distractions to a minimum. Since the ADD brain functions too slowly while processing sensory information, concentration comes more easily when the stimulation level remains low.

To encourage body awareness, Randolph begins by asking Clayton how tight his body feels and how much warm-up he needs. Depending on the answer, Randolph begins with Suryanamaskar (Sun Salutation) in either a 12- or 28-posture sequence. This cycle challenges Clayton's ability to focus and helps increase his attention span. Learning a complex series like Sun Salutation "recruits a lot of nerve cells in the prefrontal cortex," says Ratey. "The brain is like a muscle: When you strain it, you strengthen it." But purely intellectual endeavors, like learning multiplication tables, don't promote what Ratey jokingly calls "neurological Miracle-Gro" to the extent that complex movement patterns do.

Following Sun Salutation, Randolph leads Clayton through a succession of forward bends, lateral bends, triangle poses, and backbends. In addition to their psychological benefits, these yoga poses help children with ADD learn to coordinate their bodies in space, which is important since they tend to have higher injury rates than their peers. Similar to the work of a physical therapist, carefully performed asanas engage alignment, balance, and coordination to train a child's sensory-motor system. Balancing poses like [Vrksasana \(Tree Pose\)](#) are Clayton's favorites, and he frequently practices them outside of class. Says Randolph, "Kids gravitate toward play that involves balance," such as skateboards, pogo sticks, swings, merry-go-rounds, and tumbling, because it excites what physiologists call the vestibular system. The inner ear's vestibular system allows you to judge your position in space and informs the brain to keep you upright.

But beyond its role in physiological equilibrium, researchers are discovering that the vestibular system plays a vital role in behavioral and cognitive stability. "There's a fundamental kind of coordination that patterns behavior so it makes sense and flows

together, which is believed to be deficient in those with ADD," says Eugene Arnold, M.Ed., M.D., an ADHD specialist at Ohio State University and formerly with the National Institute of Mental Health.

To this end, Randolph employs asanas like Tolasana (Scales Pose) and an exercise she's dubbed Roll Asana, in which the student rocks back and forth on the floor like a teeter-totter. Each new position in yoga provides a different plane of stimulation for the neurological circuits of the vestibular system. Inverted positions, such as [Sirsasana \(Headstand\)](#) and [Salamba Sarvangasana \(Supported Shoulderstand\)](#) are especially beneficial because they also calm the nervous system and help curb hyperactivity while training the attention system. Near the end of class, Randolph guides Clayton through a series of relaxation poses to calm his breath, quiet his mind, and prepare for meditation. Meditation lasts approximately one minute—which can seem like a lifetime for ADD children.

After four months of yoga, Clayton can finally complete a half-hour yoga session, flowing from one posture to the next with minimum interruption. Though Clayton's significant progress in yoga has not yet translated into better concentration at school, it's difficult to imagine that the focus he has developed in yoga would be confined to the sticky mat. On at least one occasion, Clayton says he used techniques learned in meditation to train his attention during a mathematics exam. On another, his mother spotted him practicing [Bakasana \(Crane Pose\)](#) in the outfield during Little League—although, unfortunately, he wasn't paying much attention to the game.

His yoga teacher accepts this gradual pace as a fact of life. "Quieting the mind is a long haul for any of us," says Randolph. "It can be an epic journey for those with ADD, but they need it most." Talking with Clayton about his yoga practice, one gets the sense that he's found something important and personal at which he can excel—a refuge for his spirit and a tool for establishing harmony between his body and mind.

After several years of yoga, Askew knows it takes that kind of full-time commitment to manage the symptoms of ADD. Maintaining a healthy lifestyle that includes yoga has helped Askew cope with her condition. It gives her confidence to know she can gain mental clarity on her own—without a pill. "Yoga," says Askew, "involves learning how to manage attention and learning how to move fluidly from focusing on the details to the big picture."

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