

NON-DRUG TREATMENTS for ADHD

New Options for
Kids, Adults & Clinicians

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CONTENTS

Acknowledgments ix

Preface xiii

1. A Many-Splendored Thing

*What Is Attention-Deficit/Hyperactivity Disorder
and Where Does It Come From?*

1

2. Why Sweat the Science?

Getting to Know Three New Faces of ADHD

37

3. From Mother Nature

*Herbs, Melatonin, and Nootropics
(Brain Boosters)*

55

4. Food, Glorious Food

Diet, Vitamins, and Nutrients

101

5. When the Body Talks, the Brain Listens

Mind-Body Practices for ADHD

141

6. Neurofeedback Therapy and Brain Stimulation

181

7. Just Desserts

215

References 221

Index 241

PREFACE

The impetus for this book came from the many questions we have been asked by people living with attention-deficit disorder (ADD) and attention-deficit/hyperactivity disorder (ADHD), and by the clinicians trying to help them overcome the multitude of challenges they face every day at school, in the workplace, and at home. We are both psychiatrists with over thirty years of experience. In addition, Dr. Brown is a psychopharmacologist, an herbal specialist, and a certified teacher of Akido (4th Dan), yoga, qigong, and meditation. We both practice and teach integrative approaches that combine the best of standard treatments with herbs, nutrients, cognitive enhancers, mind-body practices, and brain stimulation. Many talented clinicians, yoga therapists, and teachers have found creative methods to help those who struggle with attentional problems, and we present their work throughout this book. We would like to tell you a little more about two people in particular whose ideas enriched this book: Leslie Andrade and Joy Bennett.

In preparing this book, we wanted to be certain to address the questions that are important to people dealing with ADHD. The first three chapters provide information about diagnostic issues and the scientific foundation for understanding the known causes of ADHD as well as how different treatments may work. I (Dr. Gerbarg) was fortunate to meet Leslie Andrade, an elementary school teacher, in August, 2010 at the Brown University Summer Writer's Workshop.

The first session of the creative nonfiction group revealed that Leslie and I were both working on books about ADHD, but from different points of view. Leslie's book was based on her experiences living with a husband and a child with ADHD and dealing with ADHD in her students. It became evident that Leslie's irresistible humor and indomitable spirit had gotten her through the many crises that arise when raising and advocating for children with ADHD. Eager to learn about non-drug treatments that might help her family, Leslie agreed to critique a draft of our book. She pointed out what would make the text easier or harder for readers with ADHD to comprehend. Her observations were spot on and she sent just what we needed, a barrage of questions. Leslie also agreed to describe in her own words a little about her experience as the parent of a child with ADHD.

When my son was diagnosed with ADHD in fourth grade, I resisted the label. In the late 1990s many "busy boys" were given the diagnoses. It seemed all too easy to conclude that a boy who would not sit for a long period of time and stay focused on subject matter he was not interested in needed to be medicated to fit into the mold the educational system demanded. I searched for alternative treatments, pushed his teachers to the limits of their patience, worked hard to help him meet the state standards, and often fought to enforce the accommodations he needed to be successful both socially and academically. Most frustrating of all was his untapped potential. Many could not deny he was very capable, but only occasional glimpses of his intelligence were observable. Eventually, I realized that fighting a label was not helping my son. Although I was loath to give him medication, if it would help him fulfill his potential and relate better to other children, then so be it. He took the minimum necessary while we continued looking for alternative methods to improve his life.

When Dr. Gerbarg approached me to share my experience with ADHD as a parent, wife, and educator, I felt honored. I absorbed each chapter, learned many of the reasons behind the thoughts, feelings, and behaviors I knew to be true, and rejoiced in the fact that there will now be a comprehensive resource available with many alternative treatments for people with ADHD. This book inspired me with hope, and encouraged and helped me to capture

the joy of living with people with ADHD. I hope it does the same for you and your unique, special loved one.

We met Joy Bennett, IYT 500, during a LifeForce Yoga training given by Amy Weintraub, MFA, E-RYT 500, at Kripalu Yoga Center. Joy studied with Amy, became one of her assistants, and is now a LifeForce Yoga mentor. Her understanding of children, her deep knowledge of yoga, her kindness of spirit, and her creativity provide an example for those who are searching for ways to help children whose symptoms of ADHD may range from mild to the most extreme. In Chapter 5 on mind–body practices you will read about some of the methods Joy developed to teach very troubled children and to make a difference in their lives and in the school where she worked.

Leslie and Joy exemplify the kinds of people who continue to inspire us to find new, alternative ADHD treatments. Indeed, the work of research scientists, clinicians, consumer advocacy groups, patients, and families all contributed to making this book a resource for anyone interested in looking beyond prescription medications for new approaches to the many challenges of ADHD.

CHAPTER 3 OUTLINE

Silver Bullet or Kitchen Sink?	56
Quality of Herbal Products	58
<i>Rhodiola Rosea</i> (Golden Root/Arctic Root)	59
Ginkgo and Ginseng	67
Q&A	70
French Maritime Pine Bark (<i>Pinus Pinaster</i>)	71
Q&A	73
Lemon Balm, Valerian, and Passionflower	73
St. John's Wort	74
Q&A	74
Brahmi	74
Compound Herbal Preparations	75
Eastern Medicine: Ayurvedic Herbs and Marma	76
Q&A	78
Sleep Problems	81
Nootropics	85
Q&A	88
Taking One Treatment Step at a Time	88
Resources	96

CHAPTER 3

From Mother Nature

Herbs, Melatonin, and Nootropics (Brain Boosters)

Stimulant medications are used to treat ADHD because, in many cases, they improve mental focus and reduce distractibility, hyperactivity, and impulsivity. But not all stimulants are manufactured in pharmaceutical laboratories. Many naturally growing plants contain compounds that have stimulant activity—such as the caffeine in your morning coffee or the nicotine in cigarettes. In fact, many ADHD folks become addicted to coffee and cigarettes because they temporarily improve the ability to focus. Eventually, the ADHD brain habituates (becomes accustomed to) these stimulants and stops responding unless the person keeps increasing the amounts. We have found that some people drink gallons of coffee and smoke cigarettes non-stop trying to maintain their mental focus. Unfortunately, this approach can have disastrous side effects, including ulcers, obstructive lung disease, heart disease, stroke, and cancer.

Fortunately, Mother Nature has also provided us with many plants whose stimulating compounds do not cause as many side effects or addictions. And, being the master chemist, she has enriched many of her herbs with antioxidants and other compounds that provide a cornucopia of health benefits. Thus, humankind may live long and prosper on the roots, berries, and leaves of Mother Nature's medicinal plants.

Although scientific studies have shown that certain plants improve attention and learning, only a few studies have been conducted using

people with ADHD. When we have tried these herbs in clinical practice with patients who have ADHD, many of them have had excellent responses. It is possible to combine herbs with other substances and complementary and alternative medicine (CAM) treatments to further enhance learning. Here we introduce you to some of the most useful herbs and show you how to combine them with other treatments.

In addition to herbs, this chapter covers the use of melatonin to aid sleep and a group of nootropics, or brain boosters, called *racetams*. Melatonin is a natural sleep hormone produced by a small brain structure, the pineal gland, to regulate sleep and other natural body rhythms. Melatonin is safe and effective for treating sleep problems that are commonly found with ADHD. Nootropics are synthetic compounds that enhance brain function through a variety of mechanisms. In general, they are very low in side effects. Nootropics have been studied and used in clinical practice in Europe and Russia for decades, but they are not well known in the United States.

At the end of this chapter you will find lists of all the treatments we presented in Tables 3.1 and 3.2. Table 3.1 reviews *how to use each treatment* including dosage guidelines and side effects, and Table 3.2 provides information on *where to buy good quality brands*. We want to assure you that we do not sell any of these products. Also, we have no financial relationship with any company that grows, processes, or markets these supplements. For additional information, you will find websites, organizations, books, and journals in the Resources sections at the end of this chapter.

SILVER BULLET OR KITCHEN SINK?

Before getting into specifics about these various substances, let's consider an often-asked question of why certain treatments work in some of the people some of the time, but not in all of the people all of the time. This is a very important question to keep in mind while pursuing solutions to symptoms of ADHD. In Chapter 2 we introduced you to some of the genetic and neurological differences

among people with ADHD, which may account for the wide spectrum of symptoms that can be present. Through scientific research, we are learning more about the neuroanatomy, brain functions, neurotransmitters, and genetics that may determine why some people respond better to certain treatments than others. ADHD comes in many forms with many genetic variations affecting how the symptoms emerge and how various brain areas are affected. The bottom line is: *it can be difficult to predict the extent to which an individual will respond to different therapies*. It is often necessary to do a treatment trial.

There is no one magic *silver bullet* that will fix ADHD. If you go trawling on the Internet, you will find websites touting hundreds of treatment regimens. While we *do* advocate using more than one kind of treatment, we *do not* advocate a kitchen-sink approach. From a seemingly infinite menu of options, we have selected only those therapies that have a sound scientific basis and that we have found to be effective in our work with patients. Our approach is to use multiple treatments that target specific aspects of brain dysfunction and behavior found in ADHD in order to accomplish the following:

- Improve overall brain growth and development.
- Optimize the health of neurons.
- Strengthen cellular maintenance and repair systems.
- Protect against further injury.
- Improve neurotransmitter function.
- Improve brain-wave patterns.
- Strengthen compensatory systems, such as the autonomic nervous system.
- Balance the stress response systems.

By enhancing these aspects of brain function, we can help improve many symptoms of ADHD, such as attention, memory, planning, organization, impulse control, emotion regulation, hyperactivity, academic and work performance, and behavior.

QUALITY OF HERBAL PRODUCTS

The safety and effectiveness of any product, whether it is a supplement or a prescription medication, depend upon its quality. This is especially true for herbs because the quality and potency (strength) can be affected by numerous factors, including where it was grown, whether the soil was certified free of contaminants, when it was harvested, the method used to dry and extract the medicinal compounds, what percentage of the product is in an active versus an inactive form, whether the herbal extract was tested for contaminants, the process of standardization, and the stability of the medicinal components. It is difficult for consumers to get all the information needed to be certain that they are buying a good-quality product. However, there are things that you can do to help identify the best brands.

1. Read the labels on each supplement bottle. Check to see if the product is certified organic and free of contaminants. Read the full name of the herb to be sure you are buying the correct species. Look for evidence of standardization. Some herbs are standardized by the percent of “marker compounds.” Markers are specific components used to identify an herb as genuine and help assure that it contains the minimum amount of pure herb to be effective. So, on the label you may see “standardized extract” and then the percent of the marker compound.
2. Check the number of milligrams (mg) of the herb in each capsule so that you will know how many capsules to take for therapeutic effects.
3. If a specific herbal preparation has been used in a research study and shown to be effective, then it is a good choice. Untested brands of the same herb may not be as effective.

You may wish to visit websites showing the results of impartial evaluations of many supplements. Although these sites do not present every possible aspect of product quality, they do cover important basics such as whether the product in the bottle is exactly what it claims to be on the label, what percent of the product is in an active form, and whether it contains contaminants:

- www.consumerlab.com
- www.supplementwatch.com
- www.fda.gov/medwatch

We have done a good deal of your homework for you by checking out supplements for quality and efficacy. Remember, you may take a shortcut by simply consulting the tables at the end of this chapter. There you will find lists of supplement brands that we have found to be consistently effective. This is not a comprehensive list, but it will provide you with some reliable choices for each of the supplements discussed in this book.

RHODIOLA ROSEA (GOLDEN ROOT/ARCTIC ROOT)

Rhodiola rosea (golden root, arctic root), an ancient medicinal herb, improves alertness, attention, and accuracy. It is especially effective in reducing the number of errors during tedious tasks such as computer work or homework that require many hours of attention. *Rhodiola* grows in extremely cold environments at high altitudes, above 8,000 feet, in the Caucasus Mountains of the Republic of Georgia, the Altai Range in the former Soviet Union, Scandinavia, Alaska and northern Canada. Large farms are cultivating *R. rosea* in Scandinavia and the former Soviet Union. In the last five years, as the demand for this versatile herb have soared *R. rosea* farms have been started in Canada and Alaska. Dr. Petra Illig initiated the Alaska *Rhodiola* Products, a non-profit farmer's co-op by growing 90,000 *R. rosea* seedlings in her front yard (<http://www.alaskarhodiolaproducts.com>). After two years of growth the plants were distributed to Alaskan farms. The picture on the cover of this book shows a stunning three-year old *R. rosea* plant blooming in Bethel on the Yukon–Koskoquim River delta on the southwest coast of Alaska. The flowers are bright yellow at their peak, turning to rose, purple, and rust colors as fall approaches. *Rhodiola rosea* (*R. rosea*) is the perfect example of an herb that has long-term health benefits rather than health risks. Here is an example of how this herb helped a student with ADHD get better grades naturally.

Joseph was a highly intelligent 16-year-old. Despite having an IQ in the superior range, he maintained only a B average in school. He got by on whatever he picked up in class, spent no time studying, and dashed off assignments while riding the bus or eating lunch in a noisy cafeteria. His parents chalked it up to immaturity and assumed he would get serious about his studies as college approached. Instead, as the high school courses became harder, his grades slipped to C's and then D's. Talking, offering rewards, arguing, shouting, punishing, or confinement—nothing worked. Joseph became resentful and frustrated. He was getting to the point of giving up rather than repeatedly trying and failing.

Joseph's high school guidance counselor called a meeting because he had begun skipping classes, and his English teacher was alarmed by an essay in which he wrote, "I wish I was dead." The parents immediately made an appointment with a child psychiatrist, who concluded that Joseph had the inattentive form of attention-deficit disorder (ADD)—that is, without hyperactivity. He also had depression secondary to all of the negative effects of ADD on his life. The psychiatrist recommended individual therapy and a stimulant medication, Ritalin, for Joseph, as well as family therapy. Joseph adamantly refused. Like many teenagers, he did not want to be labeled or seen as abnormal, different, or "crazy." However, he did agree to meet with the psychiatrist alone to see if anything else could be worked out. During these sessions, the psychiatrist listened to Joseph's frustrations and engaged him in trying to find some solution other than medication. When he suggested an herb, Joseph got interested because, to him, herbs, unlike medicine, were natural. Once the doctor explained that *Rhodiola rosea* had been shown to improve both mental and physical performance in athletes, military cadets, and cosmonauts (Russian astronauts), Joseph was eager to try it. The fact that *Rhodiola rosea* had been used by the Vikings for strength and endurance added to its appeal.

The next day, Joseph began taking *R. rosea* (Rosavin Plus brand) 150 mg in the morning on an empty stomach. Each week he increased the dose by one capsule until he was up to 300 mg twice a day. This dosage enabled him to sit and study, complete writing assignments on time, and prepare for exams. His average rose to a B+ with A's in math and science. Although he was no longer at odds

with his parents, he still couldn't wait to leave home, especially with the chance of going to a great college.

Joseph was lucky to have such a good response to *R. rosea*. In other people, the herb may help, but to a lesser degree. Yet, even a smaller improvement can make a big difference in the quality of life, particularly when added to other treatments. In our practices, we find a range of responses to this herb. We use it often, because most people report improvements in energy, mood, mental clarity, and focus. For some people, like Joseph and Brad (the Gentle Giant from Chapter 1), this herb can make an enormous difference.

Let us update you on what happened to Brad. Taking 150 mg a day of Rosavin Plus, Brad was able to finish school and get a job as a counselor. Although he loved working with clients, it was difficult for him to communicate with his superiors. He was often criticized for how he spoke to the clients and after about 5 months, when he did not show enough improvement, he lost the job. When I (Dr. Gerbarg) spoke with Brad, it was apparent that he was so caught up in his own circular thoughts about what had gone wrong at work, he could not listen to or respond to my questions.

I suggested that he increase his Rosavin to take two 150 mg capsules in the morning and one mid-day. The increased dose helped him to think more clearly and the effects lasted longer. Six weeks later he found a new job with higher pay. So far he is getting along well there. The supervisors are satisfied with his work, and the staff enjoys and appreciates him.

Before moving on to the next herb, we review the scientific evidence, risks, benefits, and dosage details that you and your doctor will need in deciding whether to try *R. rosea*.

The Science of *Rhodiola rosea*—What Went on Behind the Iron Curtain?

Most of the research on *Rhodiola rosea* (*R. rosea*), done by the Soviet Union and the Swedish Herbal Institute, was hidden in classified documents and kept from publication until the late 1990s (after the collapse of the former Soviet Union). The Soviet Ministry of

Defense tested *Rhodiola rosea* and other herbs to increase the intellectual productivity of scientists and the performance of military personnel, Olympic athletes, and cosmonauts (Baranov, 1994; Panossian & Wikman, 2009). In numerous studies their researchers found that *R. rosea* root enhanced learning, memory, intellectual work capacity, speed, and accuracy. Tests run for many hours showed that over time, under the stress of fatigue and boredom, this herb significantly reduced the rate of errors, for example, in a tedious symbol correction test, compared to placebo (Brown & Gerbarg, 2004).

Rhodiola rosea is one of an elite class of medicinal herbs called *adaptogens*, based on their ability to protect living organisms from multiple stressors—infections, toxins, free radicals, radiation, heat, cold, low oxygen, physical strain or injury, and psychological stress (Brekhman & Dardymov, 1969). The following list describes some of the most useful adaptogens and their benefits:

1. *Eleutherococcus senticosus* (Siberian ginseng)—antistress, strength, endurance, intellectual productivity, immune cell response
2. *Panax ginseng* (Asian ginseng, Korean ginseng)—antistress, anti-fatigue, muscle strength, reaction time, alertness, intellectual performance, immune function, anticancer
3. *Rhodiola rosea* (Arctic Root, Golden Root)—anti-stress, antifatigue, physical and mental energy, physical and mental performance and endurance, alertness, memory, accuracy, learning, strength, recovery time, depression, anxiety, PTSD, menopausal symptoms, sexual function, high altitude sickness, liver protection and detoxification, anticancer, recovery from stroke or other brain injury
4. *Rhaponticum carthemoides* (luzea)—antistress, strength, endurance, work capacity, recovery following illness, liver health, antibiotic, blocks absorption of carcinogens
5. *Schizandra chinensis* (Schizandra)—antistress, antianxiety, energy, sleep, memory, physical strength and endurance, liver health
6. *Withania somnifera* (Ashwaganda)—antistress, physical strength and endurance

Other medicinal herbs that are used in combination with adaptogens to enhance their benefits include:

1. *Aralia mandshurica* (Manchurian thorn tree) –physical performance, energy, antiradiation
2. *Ginkgo biloba* (Ginkgo) –antioxidant, mental performance, erectile function, stroke prevention, vascular disease, macular degeneration
3. *Rhododendron caucasicum* (Georgian snow rose) –antistress, anti-fatigue, physical and mental performance, strength, recovery time, work capacity, alertness, memory
4. *Ribes nigrum* or *Rives nibrum* (black currant) –anti-inflammatory, atopic dermatitis, essential nutrients

One of the main differences between the contents of a prescription medication and the root of a plant is that most synthetic medications contain only one biologically active compound designed to have one specific effect, whereas the root of the *Rhodiola rosea* plant contains hundreds of bioactive compounds with countless effects on organ systems throughout the body. For example, studies have shown that extracts of *R. rosea* can increase the ability of chemotherapy drugs to kill many kinds of cancer cells, while at the same time protecting normal cells of the liver, breast, and bone marrow from the toxic effects of the chemotherapy (Brown, Gerbarg, & Muskin, 2009).

Rhodiola rosea improves brain functions through a number of different mechanisms. At the cellular level, its arsenal of antioxidants prevents free radical damage to energy-producing mitochondria, DNA, and cell membranes. Studies suggest that it also increases production of creatine phosphate (CP) and adenosine triphosphate (ATP)—the high-energy molecules that transport energy wherever it is needed to keep brain cells running and to fuel cellular repair mechanisms (Furmanowa, Skopinska-Rozewska, Rogala, & Malgorzata, 1998; Kurkin & Zapesochnaya, 1986). In brain cells, this prevents mental fatigue, maintains focus, and enhances intellectual functioning.

Rhodiola rosea stimulates a network of nerves in the brainstem, called the reticular activating system, which literally wakes up the brain, increases attention and alertness, and raises the level of neurotransmitters such as dopamine, serotonin, and norepinephrine (Petkov et al., 1986). These neurotransmitters are essential for intellectual activity, regulation of mood and emotion, organization and planning,

and inhibition of impulsivity. Furthermore, *Rhodiola rosea* helps balance the stress-response system, preventing the excess release of stress hormones (e.g., cortisol) and excitatory neurotransmitters, which can damage brain cells (Panossian & Wikman, 2009).

One unexpected finding was that although *Rhodiola rosea* was mentally stimulating, at the same time it was emotionally calming. As a result, people given the herb not only performed better on tests, but they also did not get frustrated, even after 12 or 18 hours of testing. In contrast, those given an inactive placebo became crabby, tired, and negative after so many hours of repeated testing. This unintended benefit was attributed in part to the herb's effects on the stress response system as well as on neurotransmitters—serotonin, norepinephrine, and dopamine.

How to Use *Rhodiola rosea*: Timing, Dosing, and Side Effects

The following information provides guidelines for using *Rhodiola rosea* as a complementary treatment for people with ADHD. This herb is not intended to replace medication. Be sure to check with your doctor and to ask him or her to monitor your response (or the response of your child) before using this or any of the other treatments we describe.

Sidebar 3.1

Scientific Studies of *Rhodiola rosea*

In double-blind, placebo-controlled studies, *Rhodiola rosea* prevented mental fatigue, reduced errors, enhanced learning, and improved the quality of work. Here are examples of a few of these studies.

- Sixty Indian medical students studying in Russia were randomly assigned to groups given 100 mg/day of *Rhodiola rosea* extract (SRH-5 Swedish Herbal Institute), placebo, or nothing. Those given *R. rosea* had less mental fatigue, higher final exam grades, better physical fitness and coordination, and a greater sense of well-being compared to those who didn't take the herb (Spasov, Wikman, Mandrikov, Mironova, & Neumoin, 2000).
- Out of 60 foreign seniors at Russian high schools, 20 were given 660 mg/day of a *Rhodiola rosea* preparation with vitamin C, called *Rodaxin*; 20 got a placebo; and 20 got no treatment. The group given *Rodaxin* had less mental fatigue and anxiety as well as better work performance, higher final exam grades, improved coordination and well-being, and a 60.7% increase in their language-learning ability compared to the students who didn't take the extract (Spasov, Mandrikov, & Mironova, 2000).
- The Russian Ministry of Health evaluated two different doses of standardized *Rhodiola rosea* extract on mental functioning under conditions of stress and fatigue. In a randomized, double-blind, placebo-controlled study of healthy military cadets, ages 19–21, *Rhodiola rosea* showed a pronounced anti-fatigue effect as well as significant improvements in pulse and blood pressure. The cadets also reported greater feelings of general well-being (Shevstov et al., 2003).

Children 8–12 Years Old

Although very small doses of *R. rosea* can be helpful in children, it can also cause overstimulation and difficulty sleeping and therefore should be used cautiously. If agitation or insomnia occurs, the dose should be reduced or the herb discontinued. Soviet research on *R. rosea* in children was never published in any detail. However, among the people living at 8,000–10,000 feet in the Caucasus Mountains, where the herb grows wild, families brew a tea from the herb and drink it daily. It is given to children there without harm.

One way to try *R. rosea* in young children is to use a brand that comes in capsule form—for example, Rosavin (Ameriden International) containing 100 mg *Rhodiola rosea*. Open the capsule and dissolve the contents in one 8-ounce cup of any drink, such as juice, milk, tea, or cocoa. Stir thoroughly and give 1/16 cup (that is ½ ounce or 6.25 mg of herb) for the first dose. Store the rest in the refrigerator with a cover and a label so no one else drinks it by mistake. *Rhodiola rosea* should be given in the morning. See what effect it has that day. If that does not cause agitation or difficulty sleeping, increase to 1/8 cup (i.e., 1 ounce or 12.5 mg of herb) the next morning. The next day, increase to 1/4 cup (2 ounces or 25 mg of herb). Repeat this same dose for 3 or 4 days to determine the effect. If there are no problems, use 3/8 cup (3 ounces or 37.5 mg of herb) for 3 or 4 days. Then try ½ cup (4 ounces or 50 mg of herb).

Continue this for 1 week to evaluate the results. After this trial, you may increase by ¼ cup or 25 mg of herb every 5–7 days as long as there are no problems. When you get up to a full capsule, continue that same dose for 2 weeks before increasing further. The idea is to allow enough time to evaluate the effects before increasing the dose further. If significant side effects occur, then the dose should not be increased. Depending on the size of the child and his or her sensitivity to the herb, the final dose could range from ¼ of a capsule (25 mg) up to a maximum of 4 capsules (400 mg) per day for an older child.

Adolescents 12–18 Years Old

R. rosea 50 mg/day; increase by 50 mg every 5–7 days, up to a maximum of 500 mg/day, as long as this dose does not cause anxiety, agitation, or insomnia. It is best taken about 30 minutes before breakfast on an empty stomach. To start with a 50 mg dose, get the 100 mg capsules. Open the capsule and pour the contents into a cup containing 8 ounces of juice, milk, or a hot drink. Drink half of the liquid and store the rest in the refrigerator for use the next morning.

Adults over 18 Years of Age

Rhodiola rosea 150 mg capsules: Start with one capsule 30 minutes before breakfast on an empty stomach for 1 week. Then add one capsule 30 minutes before lunch for 1 week. As long as you are comfortable and experience no agitation, irritability, or sleep disturbance, add a second capsule before breakfast for 1 week for a total of 450 mg a day. Wait several weeks to see the effects. If you feel you need more, add a second capsule before lunch for a total of four capsules (600 mg) daily.

Doses above 600 mg a day are not generally recommended because they have not been adequately studied. At higher doses (above 600 mg), the herb may have some effect on the function of blood platelets (as do many antidepressants), leading to bruising or increased bleeding, especially when combined with aspirin or other anticoagulants (e.g., heparin). Rarely, we find a patient who has a better response on higher doses.

In Good Company

Like many herbs, R. rosea is highly sociable. It works even better when teamed up with other herbs. In traditional folk medicine, herbs are often used in combinations rather than as solo treatments because they work best in good company. One limitation of research studies, with a few exceptions, is that they test one herb at a time. Other herbs that may be added to R. rosea to improve cognitive stimulation, learning, and productivity include ginkgo, Asian ginseng, American

ginseng, passionflower, *Schizandra chinensis*, acanthopanax (*Eleutherococcus senticosus*), and ashwaganda (*Withania somnifera*).

GINKGO AND GINSENG

Studies have shown that ginkgo and ginseng can improve learning in animals and humans. These herbs affect neurotransmitter systems and are known to be natural cognitive activators. A few studies of ginkgo and ginseng in people with ADHD have shown weak or mixed results. This is probably because the majority of people with ADHD do not benefit from these herbs. However, we find that a small number of individuals improve considerably. In situations where the person has not responded well to standard treatments or does not want prescription medications, it is reasonable to try these herbs. Using good products with high potency in adequate doses and combinations can make all the difference in response.

At the age of 31, Angie came across as a tense, critical, mistrustful, no-nonsense woman with a Pollyanna smile plastered on her face. She had held numerous secretarial and administrative jobs for short periods of time, but had been unemployed for 5 years. As a mother, she had been incompetent and custody was assigned to her husband during their divorce. In the middle of a sentence, she would abruptly stop talking, glance away, and then look back asking, "Where was I?" Lost, confused, unable to make decisions, she required constant oversight from her mother, who worried about whether she would ever become independent and self-supporting. A psychologist told her that she had ADHD and processing problems that needed treatment. Angie was afraid to take any medication because in the past she had experienced allergic reactions to many of them.

She finally agreed to see me (Dr. Brown), hoping for a non-medication treatment that would enable her to pursue a career. Angie's mother brought her to the first appointment. Her conversation was so disjointed that it was difficult to follow her meaning. After the first visit, she was unable to find my office. Month after month she

would go to the wrong entrance, wander the halls, and finally get the doorman to lead her to my door.

She agreed to try *Rhodiola rosea*. The first improvement was that her conversation became clearer and easier to follow. However, the effect was lost after a few days, possibly because she was inconsistent in taking the herb. Biofeedback (see Chapter 6) never had a chance because she missed most of the sessions. Aniracetam, a nootropic compound (see below) that improves language-related functions, did help her process better by enabling her to listen and retain more when people were talking (see Chapter 4 for more information on aniracetam). A second trial of *Rhodiola rosea* (Rosavin Plus) at 300 mg twice a day somewhat improved her mental focus and clarity. Angie's mother finally convinced her to try Adderall. After 3 days she sounded calmer, but she did not like the feeling of being quieted down, preferring to feel energized and bubbly. She refused to continue the medication.

I decided to treat her with a combination of ginkgo plus ginseng: Ginkgold 120 mg twice a day, plus a mixture of Korean, Chinese, American, and Siberian ginseng (Action Labs PowerMax 4X) taken once a day. One month later she found her way to my office alone, without the doorman. The big, natural smile on her face told me that the herbs were working and that they helped her feel the way she wanted to feel.

Angie was not totally cured, but with the ginkgo and ginseng her focus and attention improved enough that she became able to go on the Internet, read and retain better, complete household chores more consistently, and go places without getting hopelessly lost.

Ginkgo biloba—The Devil's in the Details

Ginkgo biloba, extracted from leaves of the maidenhair tree, has been used for centuries in traditional Chinese medicine to treat cognitive and memory impairment. The mechanisms of action believed to be responsible for the effects of various components of the extract include:

- Increasing blood supply to brain tissues by dilating blood vessels and reducing blood viscosity (thickness).

- Stimulating the activity of neurotransmitter systems, including dopamine.
- Stimulating the brain's "wakeup" pathways in the reticular activating system.
- Counteracting oxygen free radicals.
- Improving cell membrane fluidity.

Research on the effects of ginkgo on memory has shown mixed results, possibly due to the use of unproven products, variations in the populations studied, or other factors. Ginkgo was used in a small pilot study of six adolescents (17–19 years old) who had ADHD with additional diagnoses: three with oppositional defiant disorder; two with conduct disorder; and one with learning disabilities. All were given 200 mg a day of ginkgo extract EGb 761, a product that has proven to be clinically effective in many studies for other conditions. Significant benefits were found in arousal, hyperactivity, calming, anxiety, frustration tolerance, affect regulation, irritability, cognitive aspects of selective attention and processing, and discriminant attention. Adolescents with higher levels of arousal, irritability, and hyperactivity obtained the most benefit (Niederhofer, 2010). Although this was a small, uncontrolled study, the use of a ginkgo product with proven potency led to significant improvements in these complex cases.

In contrast, a 6-week randomized, double-blind, placebo-controlled study of 50 children with ADHD compared the effects of 80–120 mg per day of *G. biloba* (Ginkgo T.D., Tolidaru, Iran) to 20–30 mg per day of methylphenidate. Although it caused more side effects, methylphenidate was far more effective than Ginkgo T.D. for ADHD (Salehi et al., 2010). We could not find previous published studies using this Ginkgo T.D. preparation. This study is an example of the difficulty of interpreting research studies. We have seen a number of studies of herbs reporting negative or weak results. Looking more deeply into the details, we usually find that the researchers either used an untested product or they gave too low a dose. When interpreting new research studies, particularly when they are inconsistent with previous information, we have to get the details before accepting the results.

Ginkgo rarely causes side effects, but when it does, these can be minimized by starting with 60 mg/day and gradually increasing to 120 mg twice daily. Side effects may include nausea, headaches, and skin rashes. Although ginkgo somewhat decreases platelet aggregation (i.e., ability of blood cells to clump together to form clots), it does not appear to affect other measures of coagulation (clotting). Nevertheless, caution is needed when using ginkgo in patients who are also taking anticoagulants such as heparin, warfarin, or aspirin. Ginkgo should be discontinued 2 weeks prior to surgery. Ginkgo works well with nootropics, special substances that improve brain function, which are discussed below.

Q&A

Q: Who should take ginkgo?

A: Although ginkgo is not the first herb we would recommend for ADHD, it does have a place because it is less stimulating than some of the other treatments. Ginkgo can be useful for:

- People who are overly sensitive to, and overly stimulated by, prescription stimulants, *Rhodiola rosea*, or other treatments.
- People with ADHD who also have anxiety—they may find that ginkgo is calming.
- People who want to enhance their alertness and attention—ginkgo can be added to any other herb or nootropic.

American Ginseng (*Panax quinquefolius*)

Compared to Asian ginseng (*Panax ginseng*), American ginseng (*Panax quinquefolius*) is gentler, less stimulating, and less likely to cause agitation or headaches. So, although there is less research on American ginseng compared with Asian ginseng, it may be less likely to cause overstimulation in children. American ginseng also can improve immune function. A 4-week open study of 36 children with ADHD given American ginseng 400 mg per day, plus ginkgo 100 mg

per day, found that 74% improved significantly on the Conner's ADHD scale and 44% improved on a social problems measure. Only two children experienced mild side effects (agitation) (Lyon et al., 2001). Interpretation of the impact of ginkgo on improving test scores in this study is limited because 25 of the children were also taking methylphenidate and there was no comparison control group.

Q&A

Q: Who could benefit from American ginseng?

A: American ginseng should be considered for:

- Young children under the supervision of a physician
- People who want to avoid overstimulation
- People with ADHD who also want to improve their immune response.

FRENCH MARITIME PINE BARK (*PINUS PINASTER*)—PYCNOGENOL

Pycnogenol® is the brand name for an herb that is made from an extract of French maritime pine bark (*Pinus pinaster*). Extracts from boiled tree barks used in traditional medicines in many countries may contain polyphenols and other antioxidants whose modes of action may include:

- Reducing oxidative stress.
- Increasing blood flow to areas of the brain that are impaired in ADHD by dilatation of cerebral blood vessels.
- Regulation of catecholamine metabolism.
- Regeneration and protection of vitamins C and E.

In a 1-month double-blind, placebo-controlled study 61 children with ADHD were randomly assigned to receive either Pycnogenol or a placebo. Standardized measures and teacher and parent ratings

showed that the students given Pycnogenol had significantly greater improvements in hyperactivity, attention, concentration, and visual-motor coordination (Trebaticka et al., 2006).

A smaller study of 24 adults with ADHD randomized to receive Pycnogenol, methylphenidate, or placebo showed no differences among the three groups. This negative result may have been caused by usage of too low a dose of Pycnogenol, too short a trial period (3 weeks), or lack of herbal effect. However, some of the subjects given Pycnogenol had significant improvements and continued to take it after the study (Tenenbaum, Paul, Sparrow, Dodd, & Green, 2002). Larger randomized controlled trials (RCTs) are needed to validate these interesting findings and to determine whether people with certain polymorphisms are more likely to benefit from Pycnogenol.

There may be an association between increased levels of copper and decreased levels of zinc with hyperactivity, learning disabilities, and depression. (See Chapter 3 for a discussion of the importance of trace minerals in the diet.) Pycnogenol contains polyphenols, natural compounds with antioxidant properties. Polyphenols modulate antioxidant enzyme activities and have the ability to chelate (bind to and remove) metal ions such as copper and iron. Copper tends to increase oxidative stress whereas zinc tends to reduce it. A 1-month randomized double-blind study compared 65 children with ADHD, ages 6–14, with 54 healthy children of the same ages. At the beginning of the study, children with ADHD had significantly lower zinc levels and higher copper-to-zinc ratios than the children who did not have ADHD. In other words, they had an imbalance of trace minerals that would be associated with increased oxidative damage. Copper levels were higher in the ADHD group. Children with ADHD given Pycnogenol (1mg/kg body weight/day) showed significant decreases in copper levels and decreases in copper-to-zinc ratios, although zinc levels did not change significantly. There were no significant changes in copper, zinc, or copper-to-zinc ratios in the children who did not have ADHD. This study supports the theory that Pycnogenol may modify levels of trace minerals, normalizing antioxidant status by decreasing copper and copper-to-zinc ratios. The study also found a

correlation between reduced iron levels and response to Pycnogenol with improvements in ADHD in children (Viktorinova et al., 2009).

Q&A

Q: Who could benefit from Pycnogenol?

A:

- People who need a gentler, less stimulating treatment.
- People with low ferritin (iron) levels.

LEMON BALM (*MELISSA OFFICIANALIS*), VALERIAN (*VALERIANA OFFICIANALIS*), AND PASSIONFLOWER (*PASSIFLORA INCARNATE*)

Lemon balm and passionflower, common ingredients in over-the-counter preparations, have modest benefits, such as reducing anxiety and restlessness (Akhondzadeh et al., 2001; Kennedy, Little, & Scholey, 2004). Studies show that valerian may improve sleep (Krystal & Ressler, 2002). Although no studies have been done in people formally diagnosed with ADHD, one trial of a combination of valerian and lemon balm (Euvegal forte) was tested in an uncontrolled (meaning, no placebo comparison group) study of 918 children under the age of 12 who had restlessness and difficulty sleeping. Substantial improvements occurred in 80.9% of the children with sleep problems and 70.4 % of those with restlessness (Muller & Klement, 2006). It is likely that some of the children in this study had ADHD. Overall, studies have reported few side effects. Side effects and toxicity have not been investigated. These mild herbs may be tried, starting with lemon balm first for:

- People with ADHD and anxiety.
- People who need a mild, less powerful effect.

ST. JOHN'S WORT (*HYPERICUM PERFORATUM*)

While St. John's wort may be helpful in mild-to-moderate depression, there is no indication that this herb is useful for ADHD alone. The activity of St. John's wort is similar to the antidepressants called *serotonin reuptake inhibitors* (SRIs). Since SRI antidepressants are not beneficial in ADHD, we would not expect St. John's wort to be. One study of 54 children with ADHD, ages 6–17, did not find any effect from St. John's wort (Weber et al., 2008). However, for people with ADHD who also suffer from mild depression, it can be useful to improve mood. St. John's wort can interfere with the activity of many medications. Nevertheless, in 17 studies, the herb was well tolerated. Among these studies, at most, 5.7% of participants dropped out because of side effects, and these side effects were not serious. Before trying this herb, check with your doctor to be sure it is safe to take with your medications.

Q&A

Q: *Who might benefit from St. John's wort?*

A:

- People with ADHD and mild depression.
- People with a history of improving on a serotonin reuptake inhibitor (SSRI) antidepressant (such as Zoloft, Paxil, or Prozac), but who could not tolerate the side effects of the prescription medications. People with ADHD and symptoms of Obsessive Compulsive Disorder such as repeatedly checking things, perfectionism, repeating certain actions (for example hand washing) or rituals to control their anxiety.

BRAHMI (*BACOPA MONNIERA*)

Brahmi has been used in Ayurvedic medicine for thousands of years to enhance stress resilience, reduce anxiety, and improve cognitive

function. Antioxidant effects on brain areas *involved in ADHD* (hippocampus, frontal cortex, and striatum) have been demonstrated in animal studies. Clinical trials of brahmi in healthy adults as well as in children with ADHD have found it can mildly enhance certain aspects of learning. For example, in a small but well-done 12-week (randomized, double-blind, placebo-controlled) study of 36 children with ADHD, those given brahmi performed better on tests of sentence repetition, logical memory, and paired associate learning (Negi, Singh, Kushwaha, et al., 2000).

Brahmi shows mild cognitive enhancing effects, anti-stress effects, and other health benefits in asthma, gastric ulcers, hypothyroidism, and cardiovascular disease. In our practices, we have found it to have relatively weak benefits for ADHD. Side effects from brahmi are negligible.

COMPOUND HERBAL PREPARATIONS

We tend to customize combination treatments based upon the needs and responses of the individual. Many of these treatments are described in examples throughout the book. However, studies are being pursued to develop preparations containing many herbs, vitamins, and other nutrients believed to be of benefit for most people with ADHD. Although this may sound like a shotgun approach, it has some merits. For example, if subgroups of patients with ADHD show responses to different supplements, then preparations containing combinations of herbs and nutrients might help a fair number of people. If such combination products prove to be effective, they would provide an option for people who do not have access to health care professionals who are willing or able to administer customized complementary treatment combinations.