

HELPING CHILDREN WITH ATTENTIONAL CHALLENGES IN A MONTESSORI CLASSROOM: THE ROLE OF THE PHYSICIAN

by Maureen Murphy-Ryan

Maureen Murphy-Ryan offers a clinical look at attention deficit hyperactivity disorder (ADHD). Her thorough definition of ADHD and the diagnoses that may occur simultaneously offer teachers an awareness of what this could look like in a classroom. However, it is only with professional medical input that a true diagnosis can be made and appropriate interventions can be put in place. Behavioral interventions are outlined, as well as the extremely sensitive issue of medication. By partnering these support systems with the Montessori environment and creating a conversation that includes the needs of the child and family, there is a greater chance to successfully help children find their focus.

PURPOSE

Approximately 12% of children in the United States have attentional difficulties meeting criteria for a diagnosis of attention deficit and hyperactivity disorder (ADHD) according to the CDC's 2011 National Survey of Children's Health. This number has risen 43% in just 8 years. ADHD is considered a chronic neuropsychiatric

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syndrome. Montessori classrooms, like traditional classrooms, will have students across the spectrum of attentional abilities. The Montessori method is uniquely suited to help children with attentional challenges develop their capacity to focus and learn. Montessori teachers need knowledge of the variety of neurophysiological and psychological bases of attentional challenges, they need to know about genetic contributions to ADHD and the importance of developing a supportive working relationship with parents, and they need to know when to seek partnerships with medical specialists. Children with ADHD are at high risk and Montessori teachers need to know why early intervention and support can save lives. The most severely attention-impaired children require clinical attention for diagnosis and treatment in order to prevent or reduce future risk of negative outcomes such as substance addiction, legal infractions/ incarceration, or suicide.

The purpose of this paper is to help the Montessori educator to:

1. Know the components of a clinical diagnosis of ADHD.
2. Identify children who would benefit most from the involvement of a medical specialist; be able to name several important considerations for when to refer parents to a developmental pediatrician, child/adolescent psychiatrist, or pediatric neuropsychologist.
3. Have a basic understanding of the brain changes underlying ADHD, the genetic basis for these brain differences, and how stimulant medications work.
4. Become familiar with disorders that present similarly to ADHD or may be present alongside ADHD (differential diagnosis and comorbidity).
5. Communicate with parents why it is crucial that children with attentional challenges receive the help they need.

6. Become prepared to participate in an educational-medical care team applying multiple treatment modalities to help the child with attentional challenges be successful in and benefit from a Montessori environment.

HOW IS ADHD DIAGNOSED?

We all know what ADHD looks like—or do we? Children can be inattentive and/or over-active for a variety of reasons, including ADHD, and in order for us to know how to help these children be successful in a Montessori environment, we need to know what is driving these behaviors. How do we distinguish ADHD from other causes?

The text used to define psychiatric syndromes, including ADHD, in the United States is the *Diagnostic and Statistical Manual*, currently in its fifth edition (*DSM-5*). ADHD is a disorder defined as some combination of severe inattention, hyperactivity, and impulsivity that begins in childhood and often persists into adult years. The symptoms must cause functional impairment across multiple settings and must be developmentally relevant.

The first description of ADHD was in 1798 by Scottish physician Sir Alexander Crichton, who wrote about “the incapacity of attending with a necessary degree of constancy to any one object” and stated, “when born with a person it becomes evident at a very early period of life and has a very bad effect, inasmuch as it renders him incapable of attending with constancy to any one object of education. But it seldom is in so great a degree as totally to impede all instruction; and what is very fortunate, it is generally diminished with age” (Crichton). The similarities to later diagnostic criteria and understanding of the natural history of ADHD is striking, particularly the inborn (genetic) nature of ADHD, the importance of

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educating these children to the extent of their capacity, and the natural diminishing of symptoms over the lifespan.

Over a century later, German physicians Franz Kramer and Hans Pollnow described a “Hyperkinetic disease of infancy” in 1932, equivalent to the modern diagnosis of hyperactivity-predominant ADHD, characterized by marked motor restlessness, where such children “cannot stay still for a second, run up and down the room,” (7) “climb about preferring high furniture in particular,” (10) “are displeased when deterred from acting out their motor impulses” (7). The children Kramer and Pollnow studied “had difficulties completing difficult tasks, which may cause learning deficits and make it difficult to assess their intellectual abilities” (21). While children with attentional difficulties may have marked academic difficulties, their intelligence should not be assumed to be limited on this basis (Lange, et al.).



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Charles Bradley, M.D., 1902-1979

Pediatric psycho-pharmacology started out under the purview of pediatricians. Medical treatment of hyperactivity was first reported in 1937 by American pediatrician Dr. Charles Bradley. Bradley was studying children with mood, learning, and behavioral disorders. Bradley administered mixed amphetamine salts, known as Benzedrine sulfate, and was surprised to find that there was remarkable improvement in school performance for half of the thirty children he systematically tested. The treated children were “more interested in their work and performed it more quickly and accurately” (Gross 299). They also showed a decrease in motor activity: “It appears paradoxical that a drug known to be a stimulant should produce subdued behavior in half of the children” (582). This reflects our current understanding that children and adults with ADHD process stimulants differently due to underlying differences in brain structure and function.

Child psychiatry developed as a distinct specialty from pediatrics over the past one hundred years, parallel with the psychological study of normal child development. Child psychiatrists have completed four years of medical school and earned an M.D. or D.O., have completed three or four years of an adult psychiatric residency, and two years of fellowship in child and adolescent psychiatry. Modern child psychiatry understands childhood to be a unique stage of life (children are not small adults), utilizes appropriate standardized psychometric measurements to assess functional impairment, and provides evidence-based behavioral and pharmacological interventions with parents and teachers as essential collaborators.

The *DSM-5* (2013) made changes across multiple domains. Examples of behaviors at different ages were added to criterion items to facilitate application across the life span. The cross-situational requirement (symptoms in at least two settings) was strengthened to “several” symptoms in each setting. Some symptoms of ADHD must now be present before age twelve; this was previously age seven and was increased in part to reflect older average age of diagnosis in girls. A comorbid diagnosis with autism spectrum disorder is now allowed. A symptom threshold change has been made for adults, to reflect their substantial evidence of clinically significant ADHD impairment. For an adult diagnosis to be made, the patient only

needs to meet five symptoms, instead of six required for younger persons, in either of the two major domains: inattention and hyperactivity/impulsivity.

In the *DSM-5*, a child is assigned one of three ADHD subtypes according to clinical observation. Children may switch from one subtype to another as symptoms change over the life span. In order to be a biologically relevant distinction, research must demonstrate that children in the three different ADHD subtypes have different responses to treatment, different etiology, and/or different prognosis; none of these is yet conclusively proven, but research is ongoing. Schizophrenia is a complex mental illness in which biologically meaningful subtypes were elucidated using advanced genetic analysis (Arnedo, et al.).

DSM-5 Criteria for ADHD

People with ADHD show a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development:

Inattention: Six or more symptoms of inattention for children up to age sixteen, or five or more for adolescents seventeen and older and adults; symptoms of inattention have been present for at least six months, and they are inappropriate for developmental level:

- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
- Often has trouble holding attention on tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
- Often has trouble organizing tasks and activities.

- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
- Often loses things necessary for tasks and activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- Is often easily distracted
- Is often forgetful in daily activities.

Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age sixteen, or five or more for adolescents seventeen and older and adults; symptoms of hyperactivity-impulsivity have been present for at least six months to an extent that is disruptive and inappropriate for the person's developmental level:

- Often fidgets with or taps hands or feet, or squirms in seat.
- Often leaves seat in situations when remaining seated is expected.
- Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).
- Often unable to play or take part in leisure activities quietly.
- Is often "on the go" acting as if "driven by a motor."
- Often talks excessively.
- Often blurts out an answer before a question has been completed.
- Often has trouble waiting his/her turn.

- Often interrupts or intrudes on others (e.g., interrupts into conversations or games)

In addition, the following conditions must be met:

- Several inattentive or hyperactive-impulsive symptoms were present before age twelve years.
- Several symptoms are present in two or more settings, (such as at home and at school). There is clear evidence that the symptoms interfere with, or reduce the quality of social, school, or work functioning.
- The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.

Based on the types of symptoms, three kinds (i.e., presentations) of ADHD can occur:

- **Combined Presentation:** if enough symptoms of both criteria—inattention and hyperactivity/impulsivity—were present for the past six months;
- **Predominantly Inattentive Presentation:** if enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months;
- **Predominantly Hyperactive-Impulsive Presentation:** if enough symptoms of hyperactivity-impulsivity but not inattention were present for the past six months. Because symptoms can change over time, the presentation may change over time as well.

A child psychiatrist will use these explicit *DSM-5* criteria for diagnosis, obtain history from more than one setting (parent and teacher) using questionnaires (e.g., Connor's scales, Vanderbilt scales,

Child Behavioral Check List (CBCL), other ADHD rating scales). Their evaluation will determine the level of functional impairment and screen for coexisting conditions that may also need treatment. Two to three visits may be scheduled for a full work-up.

ADHD is most commonly identified during elementary school years when inattention becomes more prominent and impairing. While excessive motor activity may be seen when the child is a toddler, these symptoms are difficult to distinguish from highly variable normative behaviors before age four years. In preschool, the main manifestation is hyperactivity. In kindergarten, children with weaker inhibition and working memory capacities are more likely to exhibit high levels of disruptive behaviors and ADHD symptoms. Disruptive behaviors at these young ages may be more related to impaired executive function (i.e., ADHD) than oppositionality; so care should be taken when inferring intent from a child's disruptive behavior that may be better understood as symptoms of hyperactivity. This is why an accurate diagnosis is essential to providing effective assistance. It is critical that teachers and parents understand that disorderly/disruptive/destructive/"dangerous" behaviors in young children may not be willful disobedience.

WHO GETS ADHD?

The prevalence of ADHD is on the rise. Teachers in Montessori schools and traditional schools are grappling with this new reality. What do we know about this population? It is more complicated than you may think.

A basic understanding of genetic inheritance helps the teacher understand how a child may have no other family members with obvious attentional challenges, or multiple family members who carry a diagnosis of ADHD. Studies of first-degree family members show that subtle traits may be present throughout the family based on lesser genetic loading, for example schizophrenia, autism, and ADHD. ADHD is a familial disorder; put another way, even though a child may be the first family member to receive intervention for severe attentional problems, subclinical features of ADHD can be found in other family members if they are clinically tested—the tree does not grow far from the apple. Such studies tell us that

attentional capacity exists on a much wider and subtler spectrum than previously thought.

ADHD is a heterogenous condition with many known contributing factors leading to the ADHD phenotype (attentional symptoms). Risk factors and prognostic factors for ADHD include the inborn temperament of the child (those personality characteristics most strongly influenced by genetics), environmental influences in childhood (i.e., being raised in a stable environment conducive to developing attention can attenuate features of ADHD), genetics (family history of ADHD make a child more at risk to have attentional challenges), physiological factors (endocrine function, for example), and course modifiers (treatment with therapy, medication, developmentally appropriate classroom environment).

One way scientists examine how much of a complexly inherited disorder is due to genetics is through studies of identical twins raised apart. This has been applied to ADHD as well as other neurodevelopmental thought and mood disorders. Take schizophrenia, which has one of the highest genetic contributions. In prospective studies of cohorts of identical twins, where one twin is known to have schizophrenia, there is an approximately 40% chance the other will develop schizophrenia or related severe thought disorder. The other 60% of the total risk for schizophrenia is considered to be environmental: genetic + environmental risk = 100%. As a practical example, consider a young adult woman who was raised apart from her identical twin sister who has developed schizophrenia. She is worried about the chances she too will develop schizophrenia. A genetic counselor can tell her that there is a greater than 50% chance she will not develop schizophrenia. In comparison, if one identical twin had ADHD, the genetic risk for the other to develop ADHD is 75%, or three out of four. ADHD, indeed, has the highest heritability (genetic risk) of any mental disorder. First degree relatives of a child with ADHD have a five to nine times greater risk of having ADHD than the general population.

Environmental risk factors, representing 25% of the total risk for ADHD, include: low birth weight; prematurity; in-utero exposure to maternal stress, cigarette smoking, alcohol, certain prescription drugs (i.e., paracetamol), or illicit substances; environmental toxins

at a young age or in utero (lead, organophosphate pesticides); nutritional deficiencies (zinc, magnesium, polyunsaturated fatty acids); nutritional surpluses (sugar, artificial food coloring); head injury; extreme early life social deprivation; and excessive screen time.

The study of how disease and disorders, like severe attentional challenges, are represented in populations is called epidemiology. Population surveys conducted by epidemiologists suggest that ADHD occurs across cultures in about 12% of children and about half as many adults, reflecting the natural history of attentional difficulties attenuating with age. Approximately one-third of children diagnosed with ADHD meet the full diagnostic criteria in adulthood, and approximately two-thirds of children with ADHD have symptoms that persist into adulthood. In other words, most children with ADHD diagnoses will still have subclinical symptoms in adulthood. The most common persistent symptom is inattentiveness, with hyperactivity symptoms improving the most with age. About 60% of children diagnosed with ADHD will also have an additional psychiatric diagnosis by adulthood.

Boys have a 2-9 times higher risk of developing ADHD than girls. This gender gap has been lessening over the decades of study as criteria becomes more inclusive, capturing girls who are often identified later. The ratio of males to females with ADHD in the general population is 2:1 in children and 1.6:1 in adults. Girls are more likely than boys to present primarily with inattentive features. As with schizophrenia, which is present in approximately 1% of the population around the world, ADHD rates are expected to be similar geographically and across ethnic groups. However, cultural variation does exist in attitudes toward and interpretations of childhood behaviors, and clinical identification rates of ADHD for African-American and Latino populations in the United States tend to be lower than for Caucasian populations.

The contribution of temperament, character, and personality development have also been studied in ADHD. Adults with ADHD report high novelty seeking and high harm avoidance according to Cloninger's biopsychosocial model of personality. In both autism spectrum disorder and ADHD, overall cooperativeness is relatively lower than the general population, reflecting a high prevalence of

personality pathology that is found in both groups. Adults with ADHD are more likely to be diagnosed with a cluster B personality disorder (e.g., borderline personality disorder) than the general population (Anckarsäter).

WHAT CAUSES ADHD? GENE TO BRAIN TO FUNCTIONAL IMPAIRMENT

It is very important for Montessori teachers to understand that children with ADHD are not being willfully disobedient; their attention is not fully within their control, even when they are observed concentrating on preferred activities, especially activities involving electronic screens. Children with ADHD have structural and chemical differences in their brains, differences which cause real barriers to their ability to function in the same way that children without ADHD can.

The ADHD brain is fundamentally different from the typical brain. The nucleus accumbens (NA) is the primary brain structure implicated in ADHD, as well as addictive disorders; it is an aggregate of neurons within the core of the brain (subcortex). The NA is important for motivation, aversion, pleasure, reward, reinforcement learning, as well as emotional response to music, rhythmic timing, and experiencing the pleasure in response to seeing a cute baby. It is controlled by nearby areas of the brain through neurotransmitter signaling, specifically dopamine and norepinephrine. In ADHD, subcortical functions are dysregulated at the NA through an intrinsic deficiency of dopamine and norepinephrine. This in turn dysregulates connected cortical activities, primarily in the frontal lobe regions, which manifests as executive function difficulties. ADHD can be described as an executive function disorder.

Widespread structural brain alterations can be seen on MRI. Reduced total grey matter and altered basal ganglia volumes correlated with higher familial ADHD risk. There is some evidence that stimulant medication normalizes brain structure and function, with other studies showing grey and white matter abnormalities persisting into adulthood. The reality is likely a combination of these two situations.

On the molecular level, many genes of interest have been identified that each contribute a tiny amount to the genetic risk for ADHD. For

example, there is a malfunctioning variant of the dopamine transporter gene, with the addition of ten repeating DNA bases, that is associated with ADHD. Studies indicate this gene variant may play a role in brain structure and function in children with ADHD, including response to stimulants. Studies of the influence of this variant on prefrontal cortex thickness in children with ADHD showed that having two copies of the variant led to thinner cortex in the right lateral prefrontal cortex, which is involved in executive processing and dopamine function. This gene variant in a general population sample was linked to impaired executive function and increased sub-clinical ADHD symptoms. The big picture is that different genetics produce different neurological structure and chemistry, with unique responses to stimulants. As a result, caffeine, adrenaline, or amphetamines will often have a paradoxical calming effect on children with ADHD as compared to other children; i.e. the adolescent who drinks coffee before bed because "It helps me relax!"

The competent therapist will regularly review and revise targets, goals, and strategies with the child, the parent, and the teacher. The therapist will also closely collaborate with the Montessori teacher to seamlessly integrate the behavioral tools with the Montessori methods and materials in the classroom and include planned fading of these tools as the child achieves independence.

DIFFERENTIAL DIAGNOSIS AND COMORBIDITY

Children can be inattentive for many reasons: anxiety, sensory over/under stimulation, dyslexia, or ADHD. It is very important for teachers to understand the importance of an accurate determination of the cause or causes of a child's inability to attend in order to be effective in helping them. There are many disorders that look like ADHD, but require very different treatments. A differential diagnosis is needed to determine the exact cause or causes; this is carried out by a multidisciplinary team of medical specialists (preferably including a child psychiatrist or developmental pediatrician, an occupational therapist, and, in some cases, a language therapist). It is also very important for teachers to know that, more often than not, there may be multiple causes or comorbid conditions (other disorders present at the same time).

True comorbidity can result from overlapping symptomatology, one disorder manifesting itself as an earlier form of the other, and shared risk factors. Research supports this mechanism for ADHD and substance use disorders. Coexisting conditions must also be evaluated; 30%-50% of ADHD may be comorbid with other diagnoses. The most common include: oppositional-defiant disorder (ODD), characterized by a pervasive pattern of negativistic, defiant, disobedient, and hostile behaviors toward authority figures; conduct disorder (CD), characterized by a repetitive pattern of violating major age-appropriate social norms or rules; mood disorders (unipolar depression in 10%-20%, bipolar affective disorder, often seen in other family members as well). Teens with comorbid ADHD and mood disorders have worse outcomes than those with ADHD alone, including a higher risk for suicide. Anxiety disorders are present in 25% or more of children with ADHD. The most common comorbidity of all is specific learning disorders (SLD), particularly reading disorders. Learning disorders are found in up to 60% of children with ADHD seen in specialty settings.

ADHD comorbidity (disorders that may be inherited along with ADHD):

- Oppositional-defiant disorder: 30%-45%
- Conduct disorder: 20%
- Disruptive mood dysregulation disorder
- Specific learning disorder: up to 60%
- Anxiety disorders: 25% +
- Major depressive disorder: 10%-20%
- Intermittent explosive disorder
- Substance use disorders
- Antisocial and other personality disorders
- Obsessive-compulsive disorder

- Tic disorders
- Autism spectrum disorder

ADHD Differential Diagnosis (disorders that can present similarly to ADHD):

- Oppositional-defiant disorder
- Intermittent explosive disorder
- Other neurodevelopmental disorders
- Specific learning disorder
- Intellectual disability (intellectual developmental disorder)
- Autism spectrum disorder
- Reactive attachment disorder
- Anxiety disorders
- Depressive disorders
- Bipolar disorder
- Disruptive mood dysregulation disorder
- Substance use disorders
- Personality disorders
- Psychotic disorders
- Neurocognitive disorders

The reader will notice that some disorders, such as oppositional-defiant disorder, appear on both lists, because they both share some features and may be present at the same time.

If ADHD presents with intellectual disability, appropriate genetic screening may include Fragile X Syndrome, Tuberous Sclerosis, 22q11 microdeletion, and Williams syndrome. These conditions have high risk for ADHD, ADHD-like features, autism, as well as schizophrenia. The overlap between mental illnesses even in genetically “straightforward” (a few known genes involved) syndromes is impressive. We now have the technology to read every base-pair of nucleotides (building blocks of DNA) in the entire human genome through whole genome sequencing. There was hope that by comparing a sufficient number of genomes of people with specific mental illnesses to those without, several “big player” genes would be found only in those with the mental illness and would explain a large part of the inheritance of severe mental illness. However, once the data was available, it became clear that for ADHD, bipolar affective disorder, and schizophrenia, there were actually hundreds of genes each contributing a small amount to the total heritability of those illnesses, and many of which contribute to multiple diagnoses. This overlap of hundreds of genes each with a < 1% contribution to overall risk does explain the complex symptom comorbidity between certain diagnoses. For instance, some gene combinations are risk factors for multiple disorders as in ADHD and substance use disorder, bipolar affective disorder, and ADHD, etc.

WHY TREAT ADHD?

Many sympathetic parents and teachers believe that they are protecting the child from stigma when they do not seek medical advice or assistance for the child’s challenging behaviors: They believe that they can just hold things together and survive them. This denial of the child’s differences and lack of acknowledgement of the child’s very real struggles to do what other children do effortlessly puts the ADHD child at great risk for serious accidents (due to impulsivity), drug abuse (self-medication), and premature death (accident, suicide, overdose).

The consequences of not treating ADHD when clinically indicated can be quite serious. ADHD confers an increased risk of attempted and completed suicide (in a study of over 51,000 Swedish patients with ADHD, even after adjusted for comorbid psychiatric disorders, the odds ratio for attempted suicide was 3.62 [95% CI > 3], and for

completed suicide was 5.91 [95% CI 2.45-14.27]). The CI (confidence interval) is a range of values for which there is a specific chance, in this case a 95% chance, that the *true* value falls within it. There is an increased (presumed genetic) risk for suicide attempts among first degree relatives OR (odds ratio) 2.42 [95% CI 2.36-2.49], this risk is lower in more genetically distant family (Ljung, et al.). The odds ratio describes the ratio of an event happening with a specific exposure compared to without; an odds ratio less than 1 indicates the exposure decreases the likelihood of the event, such as exposure to baby aspirin decreasing the likelihood of heart attacks in a given population. ADHD is an independent predictor of greater overall number of driving offenses, higher frequency of driving without a seatbelt, greater likelihood of having driven without a valid license, more at-fault accidents, and disqualified driver's license (Kaye, et al.).

Children with ADHD are more likely to develop conduct disorder in adolescence and antisocial personality disorder in adulthood and are more likely to develop substance use disorders and experience incarceration. ADHD is overrepresented in jail and prison inmates. For example, approximately one quarter of female prison inmates in Germany have ADHD. Female prisoners with ADHD are younger at first incarceration and have longer incarceration periods than those without (Retz, et al.). Boys with ADHD are two and a half times more likely to have community correction records or incarceration records. Girls with ADHD are three times more likely to have community correction records and seven times more likely to have an incarceration record (Silva, Colvin, Glavert, & Bower).

Functional consequences of ADHD include reduced school performance and academic attainment, social rejection, poorer occupational performance/attainment/attendance. There is also a higher probability of unemployment as adults, elevated interpersonal conflict, traffic accidents and violations, and obesity. Research has demonstrated lower health-related quality of life in untreated ADHD including greater parent reported problems of emotional-behavioral role function, behavior, mental health, self-esteem, lower parental emotional health, impaired parents' time to meet their own needs, and interference with family cohesion and activities (Klassen, Miller, & Fine).

Optimal treatment (behavioral and psychopharmacological) of the symptoms of ADHD is the most effective way to reduce the incidence of substance use disorders and has been proven to decrease the rate of substance use disorders. As a case in point, ADHD symptom severity has been shown to be associated with risk for cocaine use; put in other words, the more effective a treatment regimen is at alleviating ADHD symptoms, the lower the risk for cocaine use.

INTERVENTION STRATEGIES: BEHAVIORAL INTERVENTIONS

At first glance, behavioral supports seem to be antithetical to Montessori educational principles; however, some children who cannot be successful in an “authentic” Montessori environment, are able to function, learn, and gain independence through the skilled application of behavioral tools within a scientific pedagogical approach, as advocated by Montessori. We must remember that Montessori spent her life developing a curriculum and approach for typical children. Children with ADHD are not “typical” in the way they function in the world and require supports to scaffold their way up developmentally. Behavioral supports can be designed such that they are individualized for the child/children who need them, such that the other children in the environment are not disturbed or negatively influenced, and such that a clear path is built toward optimal engagement with the Montessori curriculum and maximum independence.

A working alliance between the parent, the child, and the teacher is crucial for successful outcomes in the clinical management of ADHD. A dynamic, ongoing alliance between parents, child, teachers, and medical providers promotes maximal adherence to appropriate behavioral and pharmacological intervention and best clinical outcomes. Young children may not be able to describe their internal states, so developmentally relevant vocabulary must be used when working with children and families.

A good clinician will match the intervention(s) to the needs of the child and family. Parental factors contributing to poor adherence to behavioral or pharmacological interventions include ambivalence regarding the need for the intervention, guilt about having “caused” the condition, feelings of “inadequate” parenting, feeling responsible

for “poor” gene contribution, or inadequate parental surveillance of adherence to the intervention. Parents may be guided by misinformation from Internet sources or general public perception (Coleman, Walker, Lee, Friesen & Squire). The child may feel “damaged” or very different because of the need for intervention. Parents and teachers should be coached on how to ascribe improvement/benefits from treatment more to student effort than to medication. The teacher’s input is essential for ongoing functional assessment.



Maria Montessori surrounded by children, Italy, 1920

Behavioral therapies target a specific behavior with specific interventions to modify the environment with a goal of changing the behavior. Behavioral interventions may be employed by any trained school staff: teachers, aides, assistants, therapists, coaches, bus monitor. Behavioral interventions may be used in home, at school, or in community settings. A child behavioral therapist or clinician will identify and prioritize treatment targets, assess current level of functioning, create specific, measurable, meaningful treatment goals, develop individualized strategies to reach these goals, and track the child's progress. The competent therapist will regularly review and revise targets, goals, and strategies with the child, the parent, and the teacher. Furthermore, in an ideal world, the therapist will also closely collaborate with the Montessori teacher to seamlessly integrate the behavioral tools with the Montessori methods and materials in the classroom and include planned fading of these tools as the child achieves independence.

Cognitive and cognitive-behavioral therapies address how people think about things or perceive things. Psychosocial interventions involve how the child interacts with others. Academic interventions may include modified general instruction, small-group or individual instruction, specialized instruction techniques, or specific skill instruction.

In summary, when implementing behavioral interventions, the trained provider will think about the context/setting, be specific in their goals and prioritize them, increase external structure and support as needed, reinforce appropriate behaviors, respond immediately if further supports are required, think about how this skill fits into the child's life, remove these external structures and supports the moment the need for them is overcome, and make appropriate recommendations to other caregivers.

INTERVENTION STRATEGIES: MEDICATION

For children with ADHD, medication could save their lives—both figuratively and literally—whether it is reducing impulsivity so they don't run into the street and get hit by a car, or improving their attentiveness in order to keep them from failing or dropping out of school and then getting into trouble with drugs, sex, and

other thrill-seeking, dangerous behaviors. Nevertheless, giving ADHD medication is a very complex issue and is often fraught with side-effects and requires close monitoring and adjustments of dosage by a specialist: a child/adolescent psychiatrist, developmental pediatrician, or pediatric neuropsychologist.

Medication is a supportive tool for success in daily life and facilitates learning self-regulation and compensatory life skills in children who could not otherwise participate fully. Medications work best in combination with other interventions such as social and executive skills training, parental training, lifestyle management (physical exercise, healthy diet, sleep). Physiologic differences in childhood require lower dosing and slow titration on a weight-based scale. Shorter psychotropic medication half-lives in children may require more frequent dosing than adults. Gender differences across development also affect medication half-life and distribution.

The most effective and widely used class of medication in the treatment of ADHD is the psychostimulants. Stimulants “stimulate” certain areas of the brain to focus better. The FDA classifies a substance as “psychostimulant” if the nucleus accumbens is activated. Stimulants have been in use for “behavioral disorders” in children since Bradley’s discovery in the 1930s with many studies to document safety and efficacy. Response to stimulants does not confirm a diagnosis of ADHD as evidenced by the abuse of stimulants as “study drugs” in high schools and college.

Benefits of treatment with stimulant medication include improved focus, concentration, attention span; and reduced hyperactivity, impulsivity, and fidgeting. Adverse reactions and side effects include irritability, stomachache, headache, dysphoria, anxiety, zoned-out effect, appetite suppression and weight loss, sleep problems, height velocity slow-down (<10%). Amphetamine formulations may produce more sleep/ appetite problems, especially at higher doses. Transient tics (9%), chronic tics (<1%), mild or moderate tics occur in a significant number of patients with or without ADHD pharmacotherapy. A simple or complex tic will be experienced by 5%-8% of all school children in their lifetime. Tics during ADHD treatment may improve even while psychostimulants are used.

Adverse reaction to a specific stimulant does not contraindicate the use of other stimulants.

At high doses, psychostimulants may impair performance, memory, sequence coordination, and thought clarity. Drug toxicity may manifest as “cognitive constriction,” adventitious movements, paranoia, and disruptive outbursts. Serious side effects of psychostimulants are very rare. Sudden cardiac death has been reported primarily in patients with pre-existing cardiac conduction defects. Clinicians minimize this risk by asking about history of sudden tachycardia, fainting, and family history of sudden cardiac death prior to initiating stimulant therapy. In the rare case of psychosis related to excessive dopaminergic activity, the clinician will discontinue the stimulant medication and if absolutely necessary may restart later at a lower dose. Growth suppression may occur, but height potential is likely to be made up in late teens or during “drug holidays” (medication-free periods usually during academic vacations). Children with nausea and vomiting are especially at risk for delayed growth. The clinician should plot heights every three months to ensure proper growth velocity (Molina, et al.)

A clinician has to know when a youth “needs” the psychostimulant (e.g., early in the morning for school only or including for homework, peer activities, weekends). Parents and teachers are asked to observe efficacy and side effects through the day (teachers) and into the evening (parents). Teacher input is essential to create the optimal medication regimen. Fine tuning medication regimens requires accurate information about the child’s performance “over the day.” Clinicians will provide psychometric scales to the teacher, such as the Vanderbilt scale or Connors rating scale and will incorporate their feedback and change the medication regimen as needed.

Short- and long-acting psychostimulant preparations may be combined. A child psychiatrist may also “mix and match” with other nonstimulant anti-ADHD drugs. Nonstimulant medications include atomoxetine (brand name Strattera), which increases norepinephrine, bupropion (Wellbutrin), which increases dopamine and norepinephrine, guanfacine (Tenex, an alpha2A-agonist that calms the central nervous system), clonidine (similar to guanfacine,

important to monitor for hypotension). Failure to use input from school can result in errors in dosing medications.

Omega-3 supplementation was investigated as a possible intervention for ADHD based on meta-analysis showing decreased omega-3 fatty acids in adults with ADHD. Omega-3 supplementation was first reported to help one quarter as much as established medications. However, omega-3 supplementation was not proven more effective than placebo by a Cochrane Review and is not considered an evidence-based therapy.

For any medication, response is frequently unpredictable, and clinicians will use a “start low, go slow” approach. Rebound symptoms may be experienced if medications are abruptly discontinued or doses missed, a clinician may increase dosing frequency with a smaller dose if this occurs. The absence of response within two weeks may signify treatment failure for a particular medication or dose. Stimulants are contraindicated in a child experiencing acute mania or with a history of psychosis. Children with less hyperactive symptomatology improve on smaller doses of stimulants but also have higher failure rates.

CONCLUSIONS

With the increasing prevalence of ADHD, Montessori teachers are faced with meeting the needs of more and more of these challenging children in their Montessori environments. In order to provide the child with ADHD the individualized treatments and supports needed to be successful, first a differential diagnosis is required to determine (1) if the challenging behaviors are a result of ADHD and (2) if there are other comorbid disorders present that also need to be treated. Next, based on these identifications, the parents and teachers can reach out to the relevant medical specialists to partner in designing, creating, experimentally testing, and modifying, as needed, a support structure of behavioral tools, executive function coaching, counseling, modified teaching and materials of instruction, and, if needed, medications. As the child/adolescent develops executive function skills, the ability to self-regulate, and control of their will, many supports—including medication—may be faded over time if they are no longer necessary to function.

ADHD is a clinical diagnosis in both youth and adults. There are several subtypes with different presentations. Child and adolescent psychiatry is the field of medicine specializing in the diagnosis and treatment of ADHD. Teachers and parents are asked to complete psychometric assessment of the child's functioning as part of the diagnostic process for ADHD and to determine ongoing functional needs. Once a diagnosis is established, behavioral interventions should be tried first, both at home and in the classroom. In more severe cases, psychopharmacology may be added. Psychostimulants and atomoxetine are prescribed most commonly.

RESOURCES

Digital Resources

Classroom Strategies and Modifications

- www.schoolpsychiatry.org

Parent Education and Empowerment

- www.parentshelpingparents.com
- www.schwablearning.org
- www.greatschools.net
- www.chadd.org
- www.aacap.org (Amer Acad of Child & Adol Psychiatry: Facts for Families)
- www.parentsmedguide.org (antidepressants)
- www.add.org
- NAMI (www.nami.org)

Psychometric Scales for ADHD

- Connors rating scales (CPRS, CTRS, CAAARS) and scoring instructions are sold by Multi-Health Systems: 908 Niagara Falls Blvd., North Tonawanda, NY 14120-2060, (800) 456-3003.

- Vanderbilt Scales for rating ADHD are available free of charge at <http://www.brightfutures.org/mentalhealth/pdf/tools.html>
- Wender-Reimherr Adult ADD Scale is available at <http://www.add-pediatrics.com/add/wender.html>

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APPENDIX A: DOING GREAT THINGS WITH ADHD

by Catherine Nehring Massie

Teachers working with children with ADHD often start to wonder: Will this child ever be able to function independently as an adult in the world? Will this child ever be able to graduate high school, or complete a college course? Will this child ever be able to stay employed? Will this child ever safely be able to drive a car down the road? Will this child end up in prison? Will this child even make it to adulthood?

It is correct to wonder about these things because children with ADHD are at a high risk for many terrible outcomes. Dr. Murphy-Ryan discusses the tragic statistics on outcomes for many of these children. These high-risk children need a high level of management, support services, patience, and understanding. The adults in their lives need to have faith that they *can learn self-regulation and self-control*, that they can learn compensating skills and tools, that they can find something they are really good (perhaps even exceptional) at doing and make a living from it, and all of this can be learned with appropriate interventions and support. The adults in the lives of children with ADHD need to remember that the development of the frontal lobes and executive functioning abilities are not completed before twenty-five years of age; that is a long period of time available for them to work on improving their functioning.

Many famous people have achieved great things despite having ADHD (or maybe because of it). Through the never-ending support and belief of adults in their lives, children with ADHD have struggled and worked their way to fame. Montessori teachers are uniquely situated to help these children; it is just a matter of learning how to support them and never losing faith in their ability to ultimately succeed. It is also critically important that children struggling daily with their attentional challenges believe in themselves so they never give up. One way to help them keep hope is to tell them about other children with similar struggles who became highly successful, wealthy, and famous despite their challenges. These children

need lots of encouragement and inspiration to keep up their efforts. Children with ADHD are generally intelligent and creative and, if they have hyperactivity, full of energy as well! What a powerful combination for high achievement—if they can learn compensation skills and use supports. Here is a list of some of the highly successful people who have talked openly about their struggles growing up and living with ADHD.

- Jim Carey, Movie Actor and Comedian
- Will Smith, Movie Actor
- Liv Tyler, Movie Actress
- Woody Harrelson, Movie and TV Actor
- Ryan Gosling, Actor, Musician, Film Director, Screenwriter, and Producer
- Michael Phelps, Olympic Athlete (14 Olympic Golds)
- Bruce Jenner, Olympic Athlete (Olympic Gold Decathlon)
- Cammi Granato, Olympic Athlete, U.S. Women's Hockey Team Captain
- Terry Bradshaw, Professional Athlete (NFL Quarterback, 4 Superbowls, Football Hall of Fame)
- Pete Rose, Professional Athlete (Major League Baseball Record-Holder)
- Shane Victorino, Professional Athlete (Major League Baseball, World Series)
- Tim Howard, Professional Athlete (World Cup Soccer Record-Holder)

- Justin Timberlake, Musician and Movie Actor (Grammy Award Winner); “I have OCD mixed with ADD, you try living with that.”
- Howie Mandel, Actor
- Audra McDonald, Singer and Actress (6 Tony Awards)
- Will.I.am, Musician (7 Grammy Awards)
- James Carville, Political Strategist and Commentator on CNN
- Katherine Ellison, Foreign Correspondent (Pulitzer Prize Winner)
- Paul Orfalea, Entrepreneur (Founder of KINKOs)
- Sir Richard Branson, Entrepreneur (Founder of Virgin Airlines)
- David Neeleman, Entrepreneur (Founder of Jet Blue Air); “I have an easier time planning a 20-aircraft fleet than I do paying the light bill.”
- Ty Pennington, Builder and Reality TV Star; Mom, Yvonne Pennington, says that the very traits that once held her son back are now what make him a huge success.

People with ADHD are 300% more likely to start their own businesses. (Shane Perrault. “Seven Habits of Highly Successful Entrepreneurs with ADHD.” *Psychology Today*, Sept. 2009.) Many entrepreneurs with ADHD credit their creativity and ability to think-outside-the box with their ADHD personalities.



APPENDIX B: “FIRST-AID” TOOLS FOR TEACHERS WITH ATTENTION-CHALLENGED CHILDREN

by Catherine Nehring Massie

Here is a list of tools for Montessori teachers to immediately begin implementing with their attention-challenged children. These tools will help the teacher manage the challenging behaviors of a child with ADHD and, in the freedom of a Montessori environment, will help the child attend better to learn to manage his/her own behaviors. For mild cases of ADHD, this may be all that is required to support a child’s success in a Montessori classroom. Children with more severe attentional challenges will require a multidisciplinary evaluation, which can take weeks or months to complete. These tools can generally provide some help to the teacher and child in their daily functioning during the time it takes to get necessary evaluations completed and to implement specific, individualized interventions recommended by medical professionals.

Visual Schedule

Written daily schedules are created with pictures and words (depending on the child’s age). These schedules give the child an overview of their entire day. By providing information through the visual sense (not just the auditory sense), the visual daily schedule helps these children understand more concretely and remember the structure and sequence of their day. Many teachers have found that the visual schedule can help attention-challenged children transition more smoothly between activities throughout their day; it can make the virtual time warp that these children live in more manageable for them.

Picture Work Plan

Even when a child is reading, pictures are powerful communicators. For some children with attention challenges, making choices among works in a Montessori classroom can produce high levels of anxiety. These children are visually or cognitively overwhelmed by

the plethora of work choices in the Montessori environment; they need to be offered a small subset to choose from. Modern technology makes it easy to take pictures of the child's menu of work options (cell phone or iPad), send to your computer, and print them out on cardstock. These pictures are laminated and attached by Velcro tabs to the child's own collection of works (stored on a piece of foam board or on a long strip of Velcro attached to the wall). The child has a laminated daily work plan that is assembled using these pictures each morning. The resulting daily work plan is collaboratively created by the teacher and child to ensure that child's preferences, as well as teacher's lesson plans, are incorporated. It is also important to include breaks in the work plan for the child. These can be breaks from work or breaks to energize focus through physical activity. Pictures of the break activity are included in the work plan. This process of including the child in the planning of their breaks is a first step toward teaching self-regulation. It requires children to think about how they are feeling, how they are functioning, and what actions or activities they can do to help themselves focus and keep working through their plan.

Picture Choice Board

A picture choice board is a simplified version of a visual work plan that can be used with children even as young as in the *Casa* (ages 2.5-6 years). The simplest form is the First-Then board, with just two large windows under the words *First* and *Then*. Helpful for younger attention-challenged children, the picture choice board lets the child know what they will do first and then what comes after. This is an effective tool to get a child to engage in a least-preferred (or avoided) activity first with the promise of a highly-preferred activity afterwards, the *Then*. A picture choice board can also be used to clearly sequence activities during the work period. It is a very simple, yet highly effective tool.

Seating Alternatives

Another quick and simple tool to help children with ADHD attend during lessons, circle time, and maintain concentration during work, is an air-filled seat cushion, ball chair, or peanut chair, to allow the wiggly child to wiggle while they sit and work. These cushions not only allow the child to move, they promote proper

alignment of the spine and provide a neurological foundation for improved attention.

Something for the Hands

Stress balls, fidgets, tactile fabrics, and other objects for the child to touch, stimulate, keep busy, and exercise their hands. For some attention-challenged children, providing something for their hands can be calming and helpful to keeping their minds focused; however, these same children may be impulsive and may need careful monitoring until they learn to use those tools appropriately at all times (i.e., not throwing them, chewing on them, or bothering other children with them).

Intensive Exercise Breaks

Groundbreaking research at the Shelton School & Evaluation Center in Dallas, TX, has demonstrated significant benefit to their attention-challenged students using rigorous exercise on stationary bikes to regulate their academic performance at school. Some students were even able to drop their medications by using the exercise bikes instead. Children with ADHD need rigorous exercise to help them regulate their ability to attend and complete tasks at school; this is a life skill that will continue to benefit them as adults. Consider designing a consistent plan for rigorous daily activity for your attention-challenged students.

Relaxation Techniques

Mindfulness, yoga, controlled breathing, and meditation techniques can be taught to help these children learn to regulate their energy and emotions. These are skills that must be age-appropriately taught and practiced daily to become useful life tools for children with attention challenges.

Social Skills Training

Social skills are basically the same as grace and courtesy lessons that have been enhanced with theory of mind perspectives, social problem-solving, and unspoken social conventions. This training connects the dots that typical children connect automatically through living in a social environment. Children with ADHD often struggle

socially because they do not pay attention to their social environment, and therefore miss many social cues. The Shelton School & Evaluation Center has developed social skills curricula for preschool through high school: four levels of “Choices: A Comprehensive Social Values and Social Skills Curriculum” and “Ethics.” These daily lessons engage students in active, multisensory, and explicit learning about the social skills they need at their age.



APPENDIX C: PARTNERING WITH PARENTS IS ESSENTIAL

by Catherine Nehring Massie

As with any child with a disability, partnering with parents is essential for effectively helping a child. Montessori teachers must always keep in mind that parents of children with attentional challenges are under extreme stress. We must provide parent education, parent resources and try to support a positive family dynamic. We can encourage hope in the parents by sharing their child's successes daily—no matter how small. We can also provide inspiration with stories of famous people who have ADHD (see appendix A).

In partnering with parents, teachers need to provide encouragement and practical advice to help them maintain a positive relationship with their child. Parenting a child with ADHD can be extremely frustrating, anxiety-producing, and exhausting. As discussed by Dr. Murphy-Ryan, ADHD is highly heritable; therefore, parents of ADHD children may be less able to help their children due to their own ADHD traits. Ironically, in some cases, this may cause parents to be even less able to recognize the challenges being faced by their children. Prof. Joachim Dattke of the Theodor Hellbrügge Foundation explains that parents need to feel empowered to help their child. They need to be given very specific tasks at which they can be successful in helping their child. This strengthens the parent-child bond, which is essential to the child's success.

There are numerous proven strategies in the ADHD literature that parents can use to support their child in developing attentional capacity; to develop their child's abilities, interests and talents; to acquire coping and compensating skills; and to minimize the negative cultural influences on their child's already limited attentional capacity. These strategies provide a protective factor in the child's life, reducing the severity of their disability from ADHD and enhancing their chances for success and enjoyment of life.

Dr. Montessori's anachronistic term, Mental Hygiene, perfectly describes what we can provide a child with attention challenges

through a medical-educational partnership in a Montessori school. Viewing child development from a medical perspective, Montessori drew an interesting parallel between the applications of scientifically-created hygienic methods to ensure physical health (e.g., hand-washing to prevent illness) and the application of scientific pedagogy to create methods to ensure mental, psychological and sociological health. In *The Absorbent Mind*, she writes,

Instead of leaving everything to chance, the child's growth at this time should be a matter for scientific care and attention. This means that something more is needed than mere physical hygiene. Just as the latter ward off injuries to his body, so we need mental hygiene to protect his mind and soul from harm. (15)

Following this principal of Mental Hygiene, we can provide parents with a number of strategies to implement which will provide protective factors in their child's life. Below you will find a list of strategies that have significantly helped many children, adolescents, and adults with ADHD.

"MENTAL HYGIENE" FOR FAMILIES WITH ATTENTION-CHALLENGED CHILDREN

The following list provides preventative and empowering mental hygiene strategies targeted at the particular needs of children with ADHD.

1. Lots of Physical Activity

Highly active children thrive with a variety of physical activities, both social activities (e.g., playing soccer) and individual activities (e.g., running). Physical activity helps them feel centered and better able to attend.

- Invest in high-caliber, skill-based instruction. Some of these children will become future athletic champions. The focus on skills helps to train their ability to attend in a healthy, high-interest activity. Coaches may need to be informed of your child's challenges and reassured of your partnership with them to manage your child's participation in a positive manner.

- Encourage, but do not force, practice at home. Parent involvement is very motivating and supportive of an active lifestyle needed by these children. Practice with them, where possible, and make it fun. Work it into daily family life so that it can become a healthy routine/habit. Be assured that these children think and learn quickly, so they may not need as much practice as other children; and home practice, just like homework, is often the single most difficult thing for them to do in their lives. So keep it positive, do not nag, threaten or punish; this may harm their enjoyment or motivation for doing this activity.

2. Quality Musical Training

- Inattentive children thrive with a variety of musical activities, both individual (e.g., instrumental) and social (e.g., band, chorus). The creation of music requires sustained mental and physical attention. It is also an innately enjoyable, multisensory and motor activity; there is no better therapy for the support of attentional development!
- Invest in the best skill-based instruction available. These children can develop the ability to entertain themselves and others through movement of their bodies. Teachers and conductors, just like athletic coaches, may need to be informed of your child's challenges and reassured of your partnership with them to manage your child's participation in a positive manner.
- Encourage, but do not force, practice at home. Parent involvement is very motivating, just like in learning athletic sports. Practice with them, where possible, and make it fun. Work it into daily family life so that it can become a healthy routine/habit. Be assured that these children think and learn quickly, so they may not need as much practice as other children; and home practice, just like homework, is often the

single most difficult thing for them to do in their life. Children with inattentiveness may require shorter, more frequent practices. So keep it positive, do not nag, threaten or punish; this may harm their enjoyment or motivation for doing this activity. Keep in mind that this may become their calling in life!

- The Suzuki Method of Talent Education is perfect for these children because of the three-part partnership (Suzuki teacher, student, and parent as the home teacher) and combination of individual (one-on-one, individualized, skill-based instruction) and group (playing together as a group, attending to performance of self and others, simultaneously) components.

3. Ensure a Proper Diet

Children with ADHD need to eat a regular, healthy, balanced diet and avoid processed foods that are full of potential central nervous system irritants (preservatives and additives).

- Limit synthetic food dyes and additives. There are known variations in the way people process dopamine and histamine in the brain that makes certain people (about 8% of ADHD children) sensitive to food additives in a way that exacerbates hyperactivity. Parents can safely (because additives have no nutritional value) do a three-month trial of removal of all food dyes and additives to see if this helps their child's behaviors.
- Have your child take a daily multivitamin. Children with ADHD are at higher risk for mineral deficiencies (which can worsen their ADHD symptoms), due to not sitting still to eat regular balanced meals and/or due to appetite suppression from stimulant medications.
- About one-third of children with ADHD improve in response to evidence-based dietary interventions. Check with your pediatrician or nutritionist

before doing dietary trials or supplementations in your child's diet. There is some research evidence to suggest that deficiencies in some minerals—such as iron and zinc—may worsen ADHD symptoms and conversely dietary supplementation may improve your child's functioning. (Too much iron can be toxic, so iron supplementation must be monitored by a physician.)

- Limit sugars. Children with ADHD need a steady, regular energy supply to allow them to focus. Sugars provide a large spike followed by a large crash in energy and can cause irritability and inattentiveness. High quality protein can provide a stable energy source—found in nuts, legumes, eggs, unsweetened yogurt, real cheese, unprocessed meat, whole grains, and other healthy protein sources. Artificial sugar sources increase risks for diabetes and metabolic problems and should be avoided.
- Drink lots of water. Staying well-hydrated is important to maintain general physical and mental health.

4. Ensure Good Sleep Habits

It is well documented that sleep deprivation causes significantly diminished academic performance. Children with ADHD may have special challenges with sleep, such as insomnia at bedtime. Teenagers, especially, have trouble following good sleep hygiene. It is essential to keep a regular schedule of sleep. The formation of habits is extra difficult for children with ADHD, so parents will have to be consistent in order to help them create healthy daily sleep habits. Follow these principles of good sleep hygiene:

- Bed is for sleep *only*.
- No electronic devices in the bedroom, except for a clock that is faced away from the bed so your child cannot see it from the bed.
- Quiet environment.

- Temperature comfortable.
- Read a book if not sleepy.
- Do not allow drinking a lot of water before bedtime, so sleep will not be disrupted by getting up to use the bathroom.

5. Teach Self-Regulation Skills

Teach tools to help children learn to recognize and manage their energy. (See suggestions in this journal's chapter by Barbara Luborsky, OTR/L, and appendix B "Tools for Teachers.")

- Have your child learn mind-body practices, such as yoga, breathing techniques, mindfulness, and/or meditation. There is strong research evidence that mind-body practices are very helpful for children with ADHD. Mind-body practices calm the part of their nervous system responsible for aggressiveness and emotional reactivity; in other words, these practices improve emotional regulation. Yoga has the most scientific evidence behind it and can be considered a complementary treatment for ADHD. To be beneficial, yoga practice must become part of the child's daily routine. Implementing daily yoga as a family routine is the best way to support a child's formation of this habit. Yoga benefits everyone!
- Have your child spend lots of unstructured time in nature observing, experiencing, exploring, or just engaging in creative play. This builds mindfulness and creativity and enhances the development of control of attention, or selective attention (i.e., attending to a single stimulus out of many multisensory stimuli). The child attunes to the sound of a red bird singing or the rustle of the leaves in the wind or the cracking of footsteps on a dead branch. Mindfulness and meditation can both be enjoyably practiced in nature. Mindfulness is the observation of oneself (which requires and builds the focus of attention)

in the present moment. The multisensory pleasures or sensations of nature are perfectly suited for this experience. Finally, there is so much botany, zoology, geology, and beauty to observe in nature!

Help your child find the strategies that best support optimal functioning. These strategies must be taught as a skill and practiced until they become a habit.

6. Teach Social Skills

For children with ADHD, social skills generally need to be taught explicitly because they generally are not paying close enough attention to pick up these skills on their own. These children may have difficulty tuning in to subtle social cues or responding in an appropriate or timely manner due to their inattentiveness and/or hyperactivity. Lack of social skills can be very harmful to the development of friendships and group acceptance. It is very important to monitor your child's social interactions and help them address any deficiencies in this important area of their life.

- Encourage participation in healthy social groups. A good place to start is joining clubs, teams, or group activities in which the child has interest and talent.
- While your child is young (first plane), plan social activities for your child, then supervise, model and coach your child's interactions. In the second and third planes of development, social skills are most effectively taught at school or by a therapist in a fun group setting.
- Arrange, encourage, and participate in counseling, family and/or individual.

7. Provide an Executive Function (EF) Coach

An EF coach can help your child succeed in school. This is particularly important for adolescents in middle and high schools but may benefit some college students as well.

- An EF coach will help your child in creating organizational habits.
- An EF coach will help with development of study skills and test prep skills.
- An EF coach will assist in daily and longer term planning.

8. Limit or Ban Your Child's Exposure to Electronic Devices

Excessive screen time can change the way a child's brain develops (reducing the development of the social and communication areas of the brain) and can impact lifelong physical health and healthy living habit-formation. Limit your child's exposure to electronic devices to the greatest extent possible.

- Strictly limit your child's access to TV or disconnect television service.
- Strictly enforce daily or weekly time limits on total screen time for your child.
- Children with ADHD are at risk for media addictions and tend to spend more time in front of screens than typical children.

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APPENDIX D: ADHD QUESTIONNAIRE

by Catherine Nehring Massie

It was in 1898 that the first Italian Pedagogical Congress was held in Turin, and was attended by about three thousand educators....I was at that time an interloper, because the subsequent felicitous union between medicine and pedagogy still remained a thing undreamed of, in the thoughts of that period.

This is precisely the new development of pedagogy that goes under the name of scientific: in order to educate, it is essential to know those who are to be educated. (Maria Montessori. "Introduction." *Pedagogical Anthropology*. New York, NY: Frederick A. Stokes Company, 1913)

Dr. Montessori, the physician, the educator, and the scientist, integrated the three practices into one in service of the development of children. She scientifically integrated medical science and education/pedagogy, and it was called *scientific pedagogy*. Scientific pedagogy involved first getting to know a child in order to know how to educate that child. Therefore, in order to aid the development of a child with ADHD, it is essential to get to know him/her.

Unlike physical disabilities, ADHD is an invisible disability; it is only observed as atypical, disordered behaviors. It is difficult to fully understand the impairment of ability to function in daily life which people with ADHD struggle. It is easy to assume that the disordered behaviors are under the control of the child, or can be willed away or motivated (bribed, punished) away. It is easy to think that this child is lazy or generally inept, or to think the child has been ruined by poor parenting, or to think she or he is just being willfully disobedient. Their condition is even more confusing when these children are seen to momentarily appear to be in control, or when these children are observed concentrating on a preferred activity (such as videos, computer games, athletics, arts, music, etc.)—"Aha! Their secret is out, they *can* do it if they choose to!" It is easy to draw the conclusion that it is simply a behavior issue and to dismiss their inner neurological dysfunction and the

hurdles this can place in completing the simplest of tasks. This has been the approach of traditional schools, where these children are rewarded and punished until they sit still in the desk and pay attention (or look as if they are paying attention) to the teacher. This approach does not enlighten us to what it is like to be on the inside of these attention-challenged children. How are they experiencing the world? What are they thinking about? Why aren't they doing what they are supposed to be doing, like everyone else?

I urge all Montessori teachers with attention-challenged students to read the ADHD survey responses below and to carry out surveys of their own of people they know with ADHD. What I found out through first-hand accounts of people with ADHD was both impressive and distressing. Their innate talents, drive to succeed, and successes were impressive; but their daily life challenges with the simplest tasks, struggles to succeed, and failures were distressful. The four individuals that I interviewed are not a representative sample of persons with ADHD. First of all, they are all female, and secondly, they all fall within the best-case scenario for a person with their level of disability with ADHD. All four had extremely supportive families that worked really hard to ensure the development of their child's talents and provide opportunities for success. Without this support and positive encouragement to counter-balance the negative feedback they received from traditional school environments, the outcome is often far worse. Many children with ADHD do not succeed in school or nonacademic life, escape through substance abuse, and/or do not survive.

Of these four female interviewees, two are in their fifties, one is mid-twenties, and one is an adolescent. Pseudonyms are used to protect their privacy. While they all have ADHD, some have coexisting conditions, and all of them have struggled with anxiety. Surprisingly, three out of four have a very positive attitude about their ADHD and believe that the benefits they derive from having ADHD outweigh the challenges it presents.

ADHD Questionnaire

Getting to know you thoroughly:

1. When did you first realize you had ADHD? Did you notice being different yourself, or did other people (parent, teacher, other) point it out to you?
2. What is life like with ADHD?
3. What is your biggest challenge in daily life with ADHD?
4. What have been long-term life-planning challenges given your ADHD? What limitations have you felt on succeeding in what you wish to do?
5. What kinds of strategies, routines, or supports have you tried to use to help yourself function more successfully?
6. Have you been able to self-advocate to get your needs met or help you be more successful? How old were you before you started advocating for yourself? Why did you feel reluctant to ask for help or accommodations?
7. Have you tried any medications to manage your ADHD symptoms? How old were you when you first tried medications? Were they helpful? Were there any side-effects or downsides for you?
8. How does ADHD impact:
 - (a) your personal relationships,
 - (b) your school life, and
 - (c) your work, employment and career?
9. Do you think you derive any benefits from being ADHD?
10. If you could create a school that would suit your learning style, what would it be like? Describe teaching/learning modes and learning environment. What advice do you have for teachers with students with ADHD?

1. WHEN DID YOU FIRST REALIZE YOU HAD ADHD?

Mary: I realized I had ADHD when my kids were first diagnosed with it. (All four of her kids have been diagnosed.) When I looked at questionnaire list, I said “Oh, that’s me!” However, when I think back about my childhood, I got in trouble at the dentist because I wouldn’t stop talking long enough for him to get the instruments in my mouth.

Tiffany: I really did not know about ADHD until I was a young adult. Early on, I knew my mind was constantly racing and my feet were constantly going. I found it was a relief when I learned what it was. People get frustrated with me. I am kinder to myself now when I forget things. I accept that I am going to go in and out of the house at least three times each morning before I leave.

Sylvia: I didn’t actually think I had ADHD, even though my mom pointed it out in relation to school work, and I was diagnosed with ADHD by a psychiatrist and after a two-day assessment at a cognitive neuroscience clinic. I did not believe what they were saying was true. I had a lot of emotional turbulence in high school, I was extremely prideful and extremely sensitive and extremely rebellious. Also, extremely insecure—due to being prideful and sensitive. I was emotionally erratic.

Claire: I first knew in middle school, sometime, from talking to a friend and looking it up online and I thought “Yeah, this is me.” But I didn’t get an official diagnosis or talk to my mom about it until high school. I think I noticed it first.

2. WHAT IS LIFE LIKE WITH ADHD?

Mary: Don’t know what it is like without it, and everyone else in the house has it as well! It is full of possibilities, I do not have any learning difficulties. I can always go into many different careers, or trainings—nursing, special education, Montessori. I can always see fifty-five solutions to any one problem. I had about sixteen broken bones and other sprains and injuries by the time I left school (sixteen years old)—both wrists, skull, etc. I was a bit of a climber, I would get up on the roof. I was a real risk-taker, big risk-taker (no frontal lobe activity there!). I always found myself out with kids

who were doing the wrong thing. I do not sleep very much, only 4-5 hours a night.

Tiffany: I don't stop. I bounce from one thing to the next, sometimes I don't even realize that I have bounced. I was doing this, how did I get here? My life on a daily basis: start one thing and then start another, then another. I start the bathtub, I can't bear waiting so I go on to something else, and then I find that the tub has overflowed.

Sylvia: I felt that I could succeed better than I was doing, but I had a lot of specific issues in my life that were preventing me from succeeding. I felt that I was smarter than the other students, and I had some teachers who indicated that they believed I was extremely bright. But I could not perform to these expectations. None of the usual incentives to do well in school had any effect on me—I didn't care about my grades, I didn't care about going to college. I had this feeling that people wanted me to care about these things because I was "supposed to," which made me not want to do it. I always had a natural impulse to do what I was *not* supposed to do (ever since middle school).

I was just emotionally thrill-seeking during those years. I was hanging out with a group of people who were trouble-making, but because I was so sensitive, I would get into conflict with them too. I had a lot of energy and I felt rebellious. My group of friends gave me an outlet for these feelings, but they also liked to pick on other people's sensitivities. If a sensitivity was revealed, they would poke at it.

I had a lack of meaningful relationships, so I felt that I was completely alone and had feelings that I was different than everyone else. I could not identify with other people. I could not identify with the classroom setting. I did not want to identify myself in the way school wanted me to or my family wanted to. But then I would feel terrible for not succeeding.

Starting at about eight or nine years old, I woke up every day saying that I am going to be the best at this or that activity today. I would set goals daily. To do well in these things was easy for me, so I would then feel like a failure for not completing them.

There is an emotional component to attention. My emotional lows and emotional highs both keep me from getting mundane things done. The times that I feel most intelligent and feel most capable, were times that I would be reading and researching and having an emotional high about my life—I can understand anything, I can tackle any problem—I feel like I can concentrate to a high degree, better than other people can concentrate. When I was reading Einstein's theory of relativity, I stayed up all night and began drawing out his thought experiments, I felt very empowered. But then to do just little things, I could never complete them.

When I am feeling low, I am not capable of doing mundane things (like doing a small assignment, or turning library books in on time), I view these as trivial. I cannot do anything unless I feel like it has a grand importance to humanity. I have to relate mundane things to huge life goals, or I cannot do anything.

Just recently, I have come to accept that I have ADHD, because I continually failed to do what I wanted to do. There is an enormous gap, a divergence, between what I could do and what I actually ended up doing. I felt that I could just finish things if I wasn't so lazy. But then I knew that when I was interested in something, I could stay focused on it. Every day I stay busy all day, so I knew I wasn't lazy. Only recently have I started to become introspective and think about myself and my functioning. I started reading books on ADHD, the science behind ADHD. Little tiny facts here and there that explained my experience in the world.

I realized that little things, like caffeine, can impact my brain, my feeling sleepy or alert. I also realized that there were huge differences in how I felt emotionally, depending on how much exercise I was getting. How emotionally stable I felt, high or low, could be controlled by how much exercise I was getting. So I realized that I had a cycle of highs and lows, and I go through them faster by running. I feel centered and stable when I get back from running. I realized that I used exercise as an emotional regulator.

I am in a restless state during the day, could be a high or a low—I get frustrated all day long because I cannot get anything

done. As soon as I feel restless, either high or low, I go running. I think about the restless thoughts while I am running and if the run was long enough, I feel calmer when I am done. Sometimes I come back from running and am still restless, then I have to go out running again. It's like running changes the chemistry of how I am feeling.

I read in a book that if you try to concentrate, just because you are told to concentrate, you can't. When you have ADHD, your brain does not have the chemical environment to pay attention. The key is to figure out what stimulates your brain, working yourself to an emotional high, like running, but this is exhausting, so by the time you are ready to attend you are burnt out.

At all times, I am craving extreme stimulation. My understanding at this point is that because my brain does not naturally make enough stimulation, my body craves stimulation. So I seek to stimulate my brain by creating an emotional high or by intense physical activity. Just sitting down and doing a task feels literally impossible.

Claire: It kind of affects everything. Doing homework is very difficult and tends to monopolize my life; it's a bajillion times more difficult than for other people, but I still have to do it. I get a whole bunch of complex ideas and there is a bottle-neck effect (that's what my mom and I call it) where the "hole" is too small and nothing comes out. Homework takes a really, really long time. I can get hyperfocused on things I enjoy and it's difficult to tear myself away. Sometimes I get that way with practicing the violin, which is really nice because I get a lot done. Executive dysfunction is a big thing; it looks like being lazy but you actually want to be doing things and are stressed about it. Socially, it sometimes makes keeping track of conversations harder. I make connections quickly and I have to suppress the urge to point out off-topic things, like "Oh your shirt matches the soles of your shoes." Sensory focus is hard; I notice everything in the environment, like I can find buttons on the ground no one else sees. So I have a tough time tuning things out, including noises. Focus is hard, staying on topic is a challenge and I can accidentally make other people feel interrupted.

3. WHAT IS YOUR BIGGEST CHALLENGE IN DAILY LIFE WITH ADHD?

Mary: Maybe I am constantly looking for new stimulation because I cannot sit still. I can never sit and do one thing. I think I am always doing so many things because you always think you are not good enough. School life gives you messages that you are not very good.

School was awful, I hated every minute of it. It was horrible and restrictive. You always wanted to ask questions, but you were not allowed to. You always wanted to know why, and what are you going to use it for, which is not received well by teachers. Teachers go to the staff room and talk about how difficult it is to deal with you, and so all the other staff in the school have this idea about you, and you never really have a chance.

I think what saved me was sports and girl scouts. I was captain of the basketball team, captain of the softball team, state champion swimmer, regional champion cross country runner—it's what kept me sane and my parents sane.

It's like you have all the stations on at once, you are watching all the programs at once. Organization, organizing my day, too much stuff—materials, as well as time management. In the classroom, sometimes I get distracted and feel compelled to finish a task when I should be doing something else. Prioritization of tasks through the day—especially when I am tired. If I do not eat or sleep properly, then I have more trouble prioritizing tasks.

Following through with plans and managing time so that I can complete something. I tend to be late a lot, I forget about travel time, I don't plan my time properly. I get everything done, eventually, but tend to be late a lot.

Tiffany: Staying on a single task. I have so much going on in my mind that I jump to another thing and never finish it. I struggle with impulsivity.

Sylvia: I live in this state of fear of being stuck doing meaningless tasks—fear of mundane tasks. I think this has a physiological basis. I have a sensation of wanting to be able to sit down and do

things, but then I can't. So then I feel incompetent and frustrated. So I try to find ways to stimulate myself. Working at a service station, I would write poetry on scraps of paper about how horrific it was being there. It was like being a body that wants to use my mind for menial tasks. Intensely frustrating feeling! You have a narrative about why you feel this way, I felt that the job was meaningless. It was like being in hell at work. I would sit there in bed before going to work, having intense thoughts of dread of going to work and being in a position of not being able to stimulate myself.

Cognitive dissonance—difference between the way you think, the way you feel, and the way you act. When you tell yourself to attend to something, you start thinking of something else, you get distracted, then you keep trying to do it over and over again, and you cannot get it done—even though it is very simple. I literally cannot do it. I feel stupid because I cannot do it—especially if it is a homework task from school. If every time you have to concentrate you are unsuccessful, then you do feel stupid. Other people I know with ADHD, believe themselves to be stupid and lazy. If you have an intention to complete a school assignment and you cannot, then you feel stupid. If you have an intention to complete a job task and you cannot, then you feel lazy.

I rationalize well why I fail. But because of the years of homeschooling, where I had many successes in learning, I had enough successes there to keep me from feeling stupid during the years I went to school.

The laziness feeling does persist, because I cannot get simple mundane tasks completed. Every time I write a list, I am 100% certain that I can finish everything—even though I never do. I have a hundred little boxes that I know I will eventually be able to complete. Then I work myself up emotionally to be able to concentrate, but the tasks I need to do are never stimulating enough for me to do them. So these emotional highs are spent doing preferred activities—exercise, listening to lectures, drawing, reading unrelated texts (physics)—not school work.

When I am frustrated being in an emotional high, and I cannot complete what needs to be done, then this cycles into an emotional

low and I become incapacitated. My perfectionism interferes with completing, because when I know that I cannot get something done to the perfect level that I want it, then I become incapacitated. I often (more than half the time) fail on huge assignments because of these emotional turbulations.

I know that I am very intelligent, but then I feel like a complete failure because I cannot get anything done that I need to do each day. I feel extremely capable, and at the same time I cannot do anything. I go out to do errands, and I forget what I need in order to do the errands—I forget my driver’s license, I forget my purse, I lose everything everywhere (I just lost my new winter coat and gloves!). Then I just give up and don’t do the errands—like I never return my library books.

I am a meticulous neat person, at the same time I am a daily mess. It is very confusing being me!

After the emotional high of going out running, I have energy but I do not feel out of control anymore, I feel like I can concentrate and sit down and do something. At these times, I feel like someone who can make good decisions and be empathetic and do great things.

At other times, I feel deviant because I can never just sit down and do what I am supposed to do. Everyone else just does what they are supposed to do throughout the day, and I cannot. So I think that I am a bad person, that other people don’t like me because I don’t do what I am supposed to do like they do. I come up with a narrative about why I don’t do what I am supposed to do. This makes me feel intensely isolated from other people. It is not rational—you do things that you shouldn’t, say things that you shouldn’t.

I can put tons of effort and time into my classes, but it does not matter, I still fail. I am dysfunctional whether I am in an emotional high or low. If I stay in the emotional high, then I burn out and don’t get anything done. I feel like I have only a couple of hours in each day—sometimes no hours—where I can tell myself I want to do something and then do it.

Claire: The hardest thing is homework: time management, focus and executive function more broadly.

4. WHAT LIMITATIONS HAVE YOU FELT ON SUCCEEDING IN WHAT YOU WISH TO DO?

Mary: Other people say, “Oh, you are amazing! You get all this stuff done.” But I don’t feel like I am doing things the way I should be. Sometimes you think people are going to find out that you are really not good. I don’t think that as much now, but when I was younger I did.

I have great ideas, big ideas, but I don’t know how to get there and plan it out long-term. You think you can do everything, but now I have learned that I can’t. I have found that when you work as a team, the others can fill in the parts that you can’t manage well—organization and follow-through.

Tiffany: I started my own first business at twenty-one, became a contractor for the county, taught and organized classes. I have opened three different types of dance studios and a children’s fitness center.

My limit is about three years on anything. Then I want to go on to something else. I worked for the government about 7-8 years in order to get health insurance. It drove me crazy when I had to be in one place, but when I traveled to do training around the U.S. and was meeting people, then I could handle that. Then I opened a children’s tumbling business.

Sylvia: I have always felt like I can’t do school, I don’t want to do school. Competing for a grade on a piece of paper had no value for me. I just wanted to run off on adventures.

Limitations are sensations that I can be fifty times more intelligent, but if the other person is calm and stable, they will succeed in anything they want—college, graduate school. It does not matter how well I do something, I feel that I will fail anything I try to do. I feel like to do well in life means that I cannot try to do things “well.” Whenever I obsess over things and try to make them perfect, I inevitably run out of time.

Claire: I don't know? I'm planning on going into music. Motivation to practice is hard, it's difficult to get started, but when I am playing it's stimulating. Music is something I care a lot about.

5. WHAT KINDS OF STRATEGIES, ROUTINES, OR SUPPORTS HAVE YOU TRIED TO USE TO HELP YOURSELF FUNCTION MORE SUCCESSFULLY?

Mary: Sitting and doing paperwork is very difficult, so now I hire someone to help organize me. Coping mechanisms:

- Working with team members
- Hiring an assistant to keep you organized
- Writing lists
- Writing a calendar for the year with key dates of things that have to be done, and deadlines.
- Makes many copies of the calendar
- Lists are good; you have three lists going at the same time.

I'm a Pollyanna, I always look for something good when something bad happens. I try not to let people down. I tend to say yes to fifteen people, when I cannot possibly do it all. So I have had to learn to say, "No." I also ask another rational person about my plans to see if they think it is doable, but I don't always listen!

Tiffany: I try to surround myself with organized people. I used to do lists, but they would get so long and I would just make more lists. I had a business coach help me, so each day I list three tasks that I need to complete. I have a calendar, but sometimes I forget to look at it and I miss appointments. I look at what is coming up the next day the night before so I know what is going on the next day.

I have a cell phone and I set up alarms to remind me of meetings. I set up three warnings before the event so I have time to get myself together to leave on time.

Sylvia: I feel like I am stuck, I don't have a strategy. I can't do school and that is what I need to do to succeed in anything. The classes I do the best in are the ones that have the least homework. I don't feel like I can improve myself when I am stressed out by school. I need to be able to read and research and learn on my own. I can't do school and yet I cannot do anything professionally without more school. I'm stuck.

In art school, I could not just steadily work along on a project, so in order to increase my time on an art project, I listened to lectures (Oxford, Cambridge, Cornell Universities post free podcasts). I listened to 10-12 lectures/day. I had very high quality work, but I never finished the work—but this was not a problem in art school. It was just chance that I was able to be successful in art school, because it came naturally so easy for me.

In the middle of the night, I found that I could be very productive taking notes listening to a lecture and drawing. I have tried to use lists, massive lists, my whole life, but this does not work for me because I never complete the lists and then feel like a failure.

Claire: My mom, my planner, making lists, phone reminders, have to write things down right when I remember or I will forget. My mom has been especially helpful.

6. HAVE YOU BEEN ABLE TO SELF-ADVOCATE TO GET WHAT YOU NEED TO BE MORE SUCCESSFUL?

Mary: I just thought everybody was like this. I thought everyone was dealing with these issues. I think I could have been a doctor, if I had had help. I am a good diagnostician.

I had a photographic memory, until I had a head injury from horse riding at sixteen. I could see anything on any page, I could see the writing and read the quote from my memory, but that was impaired by injury. Having a photographic memory helped me; when I did nursing, I topped my state in the exam. I used to think everyone could do that. I just always thought I was average. I knew that some people were quieter.

I did not try to do anything for myself until I found out that I had something (ADHD).

Tiffany: As an adult, I realized how crazy my brain was, so I started having a business coach. I meet with him, once month and we set monthly goals and strategies. It's an accountability process. He gives me advice and strategies to make things happen.

Sylvia: I have never asked for help and I will never ask for help. Asking for help is perceived as being weak or lazy. This is how teachers respond to students who ask for help. The teachers say, "You just need to go home and learn it on your own." The teachers at Community College think that all the students are needy and lazy. Any requested help is interpreted as laziness; they tell you that "real" college students do thus and so, so you need to just go figure it out on your own.

Claire: Yeah, I went to meetings to get accommodations at school where I had to talk about what I needed. I think I officially got accommodations in my sophomore year of high school. My accommodations include a 504 plan with extended time on tests and in-class writing assignments. In third grade, I had had a difficult year academically and my mom and I were told by a doctor that if I went for testing they would likely identify a diagnosis. At the time, my mom said she didn't want that. Back then I felt like "I wanna be a normal kid." I didn't want to be singled out.

7. HAVE YOU TRIED ANY MEDICATIONS TO MANAGE YOUR ADHD SYMPTOMS?

Mary: I have not taken medication for 10-15 years, I am worried about the health impact. When my kids were diagnosed, I was about thirty-two years old. I was put on Ritalin. It made me quiet, I could stay on track with thoughts all the way through. I could get an essay written much quicker. But, I was not able to multitask anymore. So I became depressed about the fact that I wished I had been diagnosed at an earlier age. I began ruminating about how I would have done different things in my life, made different choices. I felt worse overall, so I stopped taking it. I only took it as needed—for performance in school or giving public speaking presentations.

Tiffany: As an adult, I have talked about medication, but at my age it is not necessarily good for your heart. How to calm the ADHD mind? A medication that helped a lot to calm my mind was anxiety medication. I have learned how to manage it now, and I am much calmer now.

Sylvia: I was prescribed medication as a freshman in high school. Most of the time, I just pretended to take the medication. I did not think I had ADHD, I did not want to take something just because someone told me to. I just stashed all the medications.

Once I came to the realization that I could affect my state of mind by doing things, like running, then I tried taking the medication. I then found that I could not take it in the evening or I would not sleep all night. During the day time, I found that whatever I was doing I could finish. I would start a task, then time would pass and I would finish. I could never do this before. Then I would find that after a few days, I would get depressed—a feeling that I hated—and I would go off the medication for a few days. Without medication, during the lows I would go running, read, or contemplate my mood; but with medication, the depression made me feel empty. While the medication does help me, when I run out of it, I cannot get organized enough to pick up the medication from the pharmacy. I have been out of it for two months now. I can't remember to take it. I take it in the middle of the night to get stuff done, then stay up all night and don't get any sleep. Then I take two of the pills because I want to get stuff done. Then I begin to feel psychotic the next day from sleep deprivation. There is a temptation to abuse the medication, because I want to stay up all night and get stuff done. Caffeine does not prevent me from sleeping.

I am always feeling like I am running out of time, then I get frustrated with myself and stay up all night to get stuff done. Then I become emotionally out of control and completely irritable—fight with my boyfriend, don't go to school, don't go to work. It requires day-to-day life skills in order to take the medication in a way that will help me. The skills I need to do this are precisely the skills that I do not have.

Or I take the medication on a day that I do not get enough sleep or eat anything [the medication suppresses her appetite—medication makes you less likely to eat, sleep, and exercise—which causes her to become depressed]. And I hate that feeling so much that I stop taking my medication. When I go off and on the medication repeatedly, I get terrible headaches.

I need to take the medication under the guidance of a psychiatrist, but I do not have the patience to schedule an appointment and follow through. I need a little ADHD-helper robot to dispense my medication, so I remember to take it and don't abuse it.

Claire: I'm not on medications now. I tried Vyvanse and Focalin, started in my sophomore year of high school. I stopped because of side effects. The medications restricted my emotional range and made my experience of life all "grayed out." I felt anxious and I had a tightness in my chest all the time. I was also more irritable with my younger sister, which she had to point out to me. I was able to be more productive, but I would rather have my full range of emotions than full productivity.

8. HOW DOES ADHD IMPACT YOUR PERSONAL RELATIONSHIPS, YOUR SCHOOL LIFE, AND YOUR WORK/CAREER?

Mary: As an adult, you have to think all the time about what you are saying, because you have no filters on what you say. You constantly say things that you shouldn't, gossip, etc. You tend to over disclose. I used to swear a lot.

I tend to talk to lecturers (e.g., professors) like friends, which often offends people. I forget to call people, forget to meet people when I have set up a meeting, forget to send birthday cards.

As for husbands, I married someone else with ADHD. We tend to live our own lives, we both work long hours, don't have time to drive each other crazy. It impacts our time together, busyness gets in the way. The house tends to get messy, we don't like to clean up. He cannot organize his environment at all! House gets messy, so I don't invite people over.

Part of ADHD is that you make a mess, then move on and never go back and clean up. So when I was growing up, I was very restricted by people who did not want the messes. “You can’t do this because you will make a mess!”

Tiffany: School—in high school, trying to keep my attention in class was difficult, unless I loved the subject, like math. Every day, I carried all my books home and I never looked at any of them, but I always intended to look at all of them. I did not struggle in school, but I could have done a lot better.

My poor husband has gotten used to me. The hardest part is getting someone to understand that you are not forgetting to do things *on purpose*. My husband gives me reminders, he tracks me and the things I need to remember. It is helpful to have supports through other people.

I always have lots of ideas, my mind is constantly coming up with ideas. My husband is my brakes sometime, because I always think I can do another thing: new ideas for businesses, new ways to do things, new inventions.

Sylvia: I cannot just do something because someone tells me to. In a job situation, I just cannot be a body filling a position. Just the thought of having to work a shift at a job would be incredibly anxiety producing. I would set up a whole list of things to do to prepare myself for this terrible dearth, I would try to stimulate myself before I went to work in order to prepare. I was often incapacitated by the thought of doing long shifts of menial tasks. I used to have anxiety attacks about going to work.

At art school, there was physical movement in drawing, as well as the intellectual stimulation of listening to the lectures. [At the Montessori school, she can also have multiple tasks with multiple kids at the same time. She is physically working with the children, lessons, and activities, as well as taking care of the environment (cleaning and organizing) and it is also intellectually stimulating thinking about the teaching moments with the kids and planning lessons. She has to keep cleaning the environment around her, while doing other tasks.]

After the emotional high of going out running, I have energy but I do not feel out of control anymore, I feel like I can concentrate and sit down and do something. At these times, I feel like someone who can make good decisions and be empathetic and do great things.

At other times, I feel deviant because I can never just sit down and do what I am supposed to do. Everyone else just does what they are supposed to do throughout the day, and I cannot. So I think that I am a bad person, that other people don't like me because I don't do what I am supposed to do like they do. I come up with a narrative about why I don't do what I am supposed to do. This makes me feel intensely isolated from other people. It is not rational—you do things that you shouldn't, say things that you shouldn't.

I can put tons of effort and time into my classes, but it does not matter, I still fail. I am dysfunctional whether I am in an emotional high or low. If I stay in the emotional high, then I burn out and don't get anything done. I feel like I have only a couple of hours in each day—sometimes no hours—where I can tell myself I want to do something and then do it.

Claire: I think I answered this question above. [See question #2.]

9. DO YOU THINK YOU DERIVE ANY BENEFITS FROM BEING ADHD?

Mary: You get a lot done powered by ADHD. Working in the recovery unit (post-op), emergency, intensive care, there is a lot going on and you can focus on many things at once. It's a real advantage in being a nurse with ADHD, because you can focus on a lot of different things at once.

Tiffany: Yes, absolutely. The fact that I have high energy, I think out of the box, I have many ideas. I think I have tried so many things, and made a lot of mistakes, that I am not afraid of making mistakes.

Sylvia: There are very few environments where my restlessness is useful. Every activity started stimulates a new activity, so multiple activities are going at the same time.

Claire: Totally. I love it, actually. I would not give it up if I had the option. It's part of my brain, who I am as a person. I understand person-first language, but I also wish ADHD were more of an adjective. As someone with ADHD, I'm more creative, I think out of the box, I can make novel connections, I'm very observant and analytic.

10. IF YOU COULD CREATE A SCHOOL THAT WOULD SUIT YOUR LEARNING STYLE, WHAT WOULD IT BE LIKE?

Mary: I disliked my educational experience so much, I chose Montessori for my kids. I saw a picture of Montessori kids cooking, and I knew this was it. Montessori is, of course, very hands-on. The farm school would have been great as an adolescent.

A lot of music, art, and gardening, sport, practical things, holistic subjects—integrated subjects (science and math together), a lot of practical components and things to do, like dramatic history reenactments.

Advice to Montessori teachers:

- Do not abandon the child. When they are wandering around the classroom, the child may be lost and needing some help to focus on what they want to do. Do not abandon them in the classroom.
- They may not be able to choose what they want to do. Making a choice can be very anxiety producing. My kids used to be very stressed by being ordered to make a choice, "Make a choice, now, or I will make it for you." They should have asked "Can I help you?"
- My son learned to make himself look busy. They can be overwhelmed by the array of choices.
- Do not give too many instructions at once. Break the instructions down.

Tiffany: I think it would be a school where I did not have to be still all the time, I could move and get up and down, where I could

experiment with things—not always just a right and wrong way. Maybe different teaching styles, learning through experience rather than just through reading the book.

When I think about school, I think of the desks and all the kids lined up. I still have the hardest time sitting in the pews during church.

Teachers need to know about children with ADHD, that they really need to move. All kids benefit from learning through movement and experimentation. These kids may make you crazy now, but they will grow up to do something productive some day.

Sylvia: In the Montessori classroom, this environment has the potential to satisfy the learning needs of children with attention challenges. It needs to be a large environment with both group spaces and individual spaces (work rugs), and a variety of different activities so that you can choose from a variety of stimulating activities. You need to be able to follow your impulses. But you also need opportunities for group discussions, where talking and interacting are valued—not just lectures, where I zone out and don't listen.

In homeschooling, I was able to do whatever I was interested in doing for as long as I liked. I was able to study what I wanted and was just steered in certain directions by my mom. I liked learning while making something with my hands—for example, 3D models of animal and plant cells. I was challenged in many areas—art, dance, singing in a chorus, playing instruments, 4-H projects. I learned only in organized activities—I never practiced at home—but due to natural talent (it was easier for me than the others), I was able to perform at least as well or better than the others.

[Sylvia was an extremely bright and talented child despite her ADHD. She won a Junior State Championship in a 4-H academic bowl competition in elementary school and had exceptional natural talents in music and art.]

Claire: Less homework, more in-class productivity. A school that understands that children need a life outside of school. More self-direction, with students choosing from a variety of topics ap-

appropriate for learning the concept to be taught. More freedom to choose among topics will allow students to use their natural motivation. A selection of diverse options for a learning objective can help move students beyond “I don’t want to do the thing so now it’s going to take ten hours to accomplish” to “I’m interested in the thing, and I want to do the thing.” Deadline flexibility would also be an option.

