



# Attention Deficit Hyperactivity Disorder

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This is a common problem, affecting a bit more than five percent of the population making it one of the most common child, adolescent and adult chronic health disorders. The diagnosis is a bit more common in males who outnumber females with the diagnosis by a 4:1 ratio for the combined-type presentation and a 2:1 ratio for the inattentive presentation. Like many medical concerns, this one is highly genetic. The expression, "the apple doesn't fall far from the tree" is certainly operational in this discussion. It is estimated that one to two thirds of children with attention deficit disorder will age into an adult with enough symptoms to affect their adult lives. So, most children with this diagnosis will have one or more close family members who are overtly affected and may be receiving therapy for this diagnosis. Or, that child may be living with a close relative who is compensating for undiagnosed deficits with some degree of effectiveness, is self-medicating (caffeine), and potentially living with frustrations of their own. Other unaffected family members will likely be frustrated by the core behaviors in an undiagnosed adult family member but not actually understand the causative diagnosis or issue. It seems intuitive that if one or both parents are still overtly affected by attentional challenges, optimizing a child's outcome might start with first improving adult functioning in that home. To do this would require enough introspection to at least wonder about the diagnosis in under-diagnosed adult family members. If suspected, seeking care and being compliant with an adult's treatment plan can be an enormous first step in bringing effective care to an affected child.

Though establishing the diagnosis is to some degree subjective, there are objective criteria that define the diagnosis and help make more accurate the subjectivity of the process. The DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th edition) is the manual of psychiatric diagnoses that lists the criteria that codify this and other psychiatric diagnoses.

The diagnostic criteria include "core symptoms" (listed below) that need to be present on a consistent and chronic basis (more than 6 months and starting before age 12 years) affecting more than one of the patient's environments (home and school) or (home and work) depending on the age of the patient and be "impactful", producing a meaningful change in the patient's functioning. The diagnosis is generally sub-categorized into ADHD-inattentive presentation, ADHD-hyperactive and impulsive presentation and ADHD-combined presentation, depending on the expressed symptoms in any given patient. The symptoms are tabulated below and subdivided by presentation characteristics.

## ADHD-inattentiveness:

- Failure to provide close attention to detail, careless mistakes
- Difficulty maintaining attention in school, play or home activities
- Seems not to listen, even when directly addressed
- Fails to follow through (e.g. homework, chores, etc.)
- Difficulty organizing tasks, activities, and belongings
- Avoids tasks that require consistent mental effort
- Loses objects required for tasks or activities (e.g. schoolbooks, sports equipment)
- Easily distracted by irrelevant stimuli
- Forgetful in routine activities (e.g. homework, chores, etc.)



ADHD-hyperactivity and impulsivity:

- Excessive fidgeting (e.g. tapping hands or feet, squirming in the seat)
- Difficulty remaining seated when sitting is required
- Feelings of restlessness in adolescents or inappropriate running in younger children
- Difficulty playing quietly
- Difficult to keep up with---seeming to always be "on the go"
- Excessive talking
- Difficulty waiting turns
- Blurting out answers too quickly
- Interruption or intrusion of others

ADHD-combined includes features from both lists above.

The rank order and significance of the core symptoms can vary from patient to patient, from one environment to another and perhaps one day to another. The impact of the core symptoms can be measured in peer relationships, school and work performance, extracurricular activities, sibling relationships, child-parent relationships, marital relationships as well as other mentoring experiences.

Considering an attentional diagnosis in a child often does not come easily to a parent couple. There are lots of reasons for this. Some of these reasons are societal and some personal. A part of our society continues to believe that the scope of psychiatric diagnoses including anxiety and depression along with attentional concerns should be best managed by increased personal vigilance. To coin an old phrase, "by pulling up my bootstraps and getting on with life" is an approach to psychiatric diagnoses that remains common in the culture. The same people who'd employ this approach to psychiatry would readily seek care for an ear ache or diabetes or cancer, but not for psychiatry. I am not at all sure why the dichotomy in approach, but it may be partially sustained by the manner in which the nation (via our insurers) pay for healthcare and thereby continue to drive home the message that mental health and physical health are in some manner, fundamentally different. Almost all health policies have some schism in payments that separates mental health care into a separate category bereft with different provider lists, deductibles, and allowables. It is unfortunate that one of the consequences of this separate and unequal treatment of mental health is the perception that mental health diagnoses affecting an estimated twenty percent of the population over the scope of a lifetime is some sort of "second class citizen". This I'm sure is part of the background that delays seeking a diagnosis and is not a matter of a parent's personal reflection about a child. This schism in approach provides for generally poor reimbursement for psychiatric care and one negative consequence of that is some psychiatrists do not accept insurance. That decision further limits access to care except for those who can pay privately "out of pocket."

Inside the family, a parent with no personal experience with attentional challenges may honestly believe that the child is lazy or restless and that pushing the child to be more self-vigilant is the path to success. When that fails to produce the desired results, punishment, criticism, and derision will often follow. A parent with personal experience with attentional challenges will often see himself in the child. Some may seek care depending on their experience with health care interventions in their own childhood. If those interventions were not successful or never took place, that affected parent may look at the evolving situation and say, "I turned out fine and so will this child". Whatever the dynamic inside the family, with two parents observing an evolving attentional challenge in one or more of their children, the differences in their child experiences cannot help but affect the approach they will have.



Often this will delay a critical parent-to-parent conversation and seeking care will be delayed. Delay will often continue until a teacher initiates a conversation with one or both parents. This is not the easiest conversation for a teacher to initiate and so more delay can take place. Eventually because of educational expectations that go unmet, a parent or teacher (sometimes consecutive teachers over consecutive years) will initiate a conversation and investigation may begin. Occasionally, the impetus to seek care is rooted in a crisis linked to being retained a grade in school or the expectation that the upcoming STAAR tests will result in failure.

Whatever reservations may exist inside the family, if you cannot look at the status quo and say this is a pattern of success we'd hoped our child (and our family) would experience, seek care somewhere! With delay will come further negativism about education and perhaps life in general on the part of the child. Academically, that child will lag further behind making the remedial work harder and more expansive. Treatment options exist once a diagnosis has been made. You may not be comfortable with some or all of the proposed options based on the diagnosis. Don't be reluctant to begin the process, because **you** hold the ultimate option to embrace or deny the diagnosis and the care options that are proposed. Whatever you choose to do in response to the options proposed, almost certainly, you and the child will be better for the education received in the diagnostic process.

Diagnostic evaluations and subsequent care can be provided by pediatricians, psychiatrists, neurologists, child neurologists and developmental pediatricians. Other health providers including psychologists, behavioral therapists, and social workers can be involved in the process. In some instances, a constellation of professionals may be involved in coordination of care. Even then, one member of the team will usually be the one who provides most of the orchestration of care.

If you've gotten (eagerly or otherwise) to the point of requesting care, you may be wondering where to begin. Generally, your child's primary care provider is where to begin the inquiry. The initial stage of evaluation should include a health history including age at onset of symptoms. Inquiry about family history ("the apple doesn't fall far from the tree") and social history as family dynamics often affect the child. Sleep history should be inquired about because significant problems in sleep often impact the educational process in a negative way. Once history gathering is complete, a physical exam to look for general health problems that may relate to the diagnosis or even the plan of care proposed is desirable. Other chronic health problems like (but not limited to) obesity, asthma, seasonal allergy, diabetes, sleep dysfunction, hearing deficits, compromised vision, malnutrition, iron deficiency and anemia can negatively impact the educational experience and need to be considered in the initial phases of investigation. In some instances, a limited amount of lab may be requested to look at these other issues. It is not a prerequisite to do a great deal of laboratory investigation unless there is a high index of suspicion on the part of the physician. Just doing lab to "cover the bases" will not often provide much meaningful information and will surely increase the cost of care. It should be noted that there is no laboratory finding that hints at or establishes a diagnosis of attention deficit disorder. If there are abnormal laboratory findings, they would be related to a constellation of other medical problems that are contributing to school failure or comorbidities associated with the diagnosis of attention deficit disorder.

Only now after all the generalities discussed above have been satisfied, should a more tailored investigation of the educational nuances of your child begin. Depending on the history, the inquiry may involve screening behavioral questionnaires for parents and teachers, review of report cards, review of standardized test results and in some instances at the outset or subsequently, psychological testing to look for emotional or behavioral differences that may coexist with the ADHD diagnosis. It is estimated that up to fifty percent of those with ADHD will have some other coexisting diagnosis that



will, if left undiscovered or untreated, negatively impact the academic setting. Diagnosis of these comorbid conditions can be costly (if done outside of school) but can in some instances hold keys to improved learning. These categories are tabulated below. Certainly, if you are reviewing the symptom table below and see behavioral features in your child from the lists below, bringing that to the attention of the managing physician would likely be valuable.

**Conduct disorder:** Repetitive and persistent violation of an age appropriate societal norms, rules, and rights of others.

- Aggression to people or animals
- Destruction of property
- Deceitfulness or theft
- Serious violations of rules

**Anxiety disorder:** Persistent, excessive, difficult to control, worry about events or activities; associated with the following below.

- Restlessness
- Easy fatigability
- Difficulty concentrating
- Irritability
- Muscle tension
- Sleep disturbances

**Depression:** Persistent disturbance in emotions, ideation, or somatic symptoms as indicated by five or more of the following symptoms and **must** include one or both of the first two symptoms below.

- Depressed or irritable mood
- Markedly diminished interest or pleasure in almost all activities
- Change in appetite or weight
- Psychomotor agitation or retardation
- Fatigue or loss of energy
- Feelings of worthlessness or guilt
- Impaired concentration, indecisiveness
- Recurring thoughts about death or suicide

**Learning disability:** Intrinsic cognitive difficulty that results in lower academic achievement than expected for intellectual potential; examples include the following below.

- Reading disorder
- Disorder of written language
- Mathematics disorder
- Learning disorder, not otherwise specified



Oppositional defiant disorder: Recurrent negative, defiant, disobedient and hostile behavior toward authority figures, including the following below.

- Losing temper
- Arguing with adults
- Actively defying or refusing to comply with adults' requests or rules
- Deliberately annoying people
- Blaming others for his or her mistakes or misbehavior
- Being touchy or easily annoyed by others
- Being angry and resentful
- Being spiteful or vindictive

We've crossed another hurdle in the evaluation and now building a nest at home and school that will help to foster success is worth consideration. At home, certain axioms will help:

1. Homework should be done with a parent as an informational resource. Homework is the business of the child or adolescent, not the parent. If you continue to provide the services of redirecting the child to the next task in the homework, long-term self-directed success will likely elude this student.
2. Homework should be done in a "dining room setting". Some family room setting, free of distractions (**no** electronics) in a setting with you available to proctor and offer resource advice as a teacher would.
3. Homework is not done in the privacy of the child's room. Generally, a recipe for procrastination, time wasting, and poor habit building. With older children, this is perhaps a very carefully earned privilege. Be careful!
4. Find a way to blend into the after-school day, extracurricular activities, child play- the "work of children" and homework. As the expression goes, "all work and no play makes Jack a dull boy." This is quite true and needs to be creatively attended to in establishing the routines that are important in helping children that almost always function better with established and anticipated routines.
5. Work on creating anticipatable routines.
6. Review the upcoming activities and the expectations to make successful participation in activities more likely. That review should be far enough in advance to finish current tasks but not so far in advance that upcoming activities are forgotten and therefore become impromptu. Generally, an impulsive schedule will negatively affect an impulsive distracted patient. Build routine.
7. Maintain a daily schedule.
8. Keep distractions to a minimum.
9. Identify unintentional reinforcement of negative behavior.
10. Limit choices to reduce frustration.
11. Find activities in which the child can be successful -- sports, hobbies.
12. Reward positive behavior, consider a "token" system.
13. Set small reachable goals to encourage success.
14. Find logical specific places to store schoolwork, toys, clothes.



At school, plan 504 (federal legislation) exists to "level the playing field" for school children disabled/disadvantaged by attentional (or any other disabling circumstance) challenges relative to the remainder of the student body. This 504 planning allows the school administration, counselor, teacher, family and child to develop an IEP (individual educational plan) to best serve the specific needs of each child. The basic tenets of the nest building at school embodied in the IEP would include:

1. Preferential seating to reduce classroom distractions
2. Remediation inside or outside the classroom where needed
3. Reduced number of assigned tasks or questions while still maintaining an appropriate degree of academic difficulty
4. Additional time to complete "timed" assignments or tests
5. Accommodations to minimize learning weaknesses
6. Accommodations to maximize learning strengths

The complexities of 504 planning and the structuring of an IEP can be an intimidating process. It may be helpful to look for professional help to maximize the interaction with the school at the time these processes take place. Professional help could come from former teachers, special education teachers or administrators with experience in the process. Professionals outside the school district who can help include social workers, licensed professional counselors, and educational psychologists. Either way, if you feel the process needs enhancement, consider looking for knowledgeable support. In your effort to maximize success, if you've managed medical problems that confound success and you've created helpful structure inside and outside the classroom and yet more needs to be done, you may have reached the point where the consideration for medication has become reasonable.

As you can see, medication is only a piece of the puzzle in creating a success building program around a child with attentional issues. If you are looking at medication as some sort of miracle medication that will obviate the need for all the "nest building" previously discussed, your child will fall short of the kind of success his/her talents would suggest are attainable. Six decades of medical and psychiatric experience with stimulant medications have demonstrated the efficacy and safety of these medications in **helping** to control behavioral symptoms of attention deficit disorder. There are quite a few medications in this class but they are variations on two basic medications: methylphenidate and amphetamine compounds.

From the beginning of medication use in treating ADHD, consider the few relative or possible contraindications to the use of stimulant medications.

1. Symptomatic cardiovascular disease
2. Moderate to severe hypertension
3. Hyperthyroidism
4. Known hypersensitivity to sympathomimetic amines
5. Motor tics or Tourette's syndrome
6. Glaucoma
7. Agitated states
8. Anxiety
9. History of drug abuse
10. Concurrent use or use within 14 days of an MOA inhibitor



Preschool aged children should in the eyes of most experts should be first managed with behavioral therapy and reserve medications for a second tier of medical management. Situations where addition of medication in preschool aged children when behavioral therapy alone is not successful include:

1. Expulsion (or threatened expulsion) from preschool or daycare
2. Significant risk of injury to other children or caregivers
3. Strong family history of ADHD
4. Suspected or established central nervous system injury -- prenatal alcohol or cocaine
5. ADHD symptoms interfere with other needed therapies

The medications can be subdivided based on duration of action between short acting and sustained release. Most school aged children will be managed with one of the sustained release products as the primary daily medication. Sustained release products are given once or sometimes twice per day and the ease of less frequent dosing usually improves compliance and provides a more sustained and steady blood level of medication. Both of these pharmacological features are associated with better symptom management and are the state of the art as it exists today in medication prescribing. Some of the medications are in liquid form, others in "sprinkle-able capsules", others in tablets and capsules that need to be swallowed. There is even one medication available in a patch for transdermal administration.

Before the initial decisions about stimulant prescribing are entertained, if anxiety is a known or a suspected behavioral difference, this should be considered before the prescribing process begins. This, for two reasons is true. First, if anxious enough, the anxiety can negatively impact the educational effort and be misinterpreted as the inattentive presentation of ADHD. If there is milder anxiety, the use of stimulants can make more manifest the anxiety symptoms as the stimulant doses are increased to achieve the expected result of the stimulants. It can be complex enough to require the skills of psychology or psychiatry to unravel the puzzle of where the educational dysfunction originates (ADHD or anxiety). Family history is important in both diagnoses and can help to clarify what medication choices would be most successful. So be sure this has been considered at the earliest stages of the prescribing of medication. Even with all these cautions expressed, if uncertainty remains, a decision will need to be made and observation for intended and unintended therapeutic effects may be the only way to clarify the situation. If a stimulant is chosen for its very long track record of success, and anxiety symptoms are exacerbated, be sure the prescriber who likely already is sensitive to this outcome, is informed so that changes in medications or changes in doses of medications can be made. Some prescribers will choose a non-stimulant if there exists a clear knowledge of or a meaningful suspicion of anxiety. Use of these non-stimulant medications or blending them with stimulants is somewhat beyond the scope of this introductory article and can be discussed on an individual basis should it be necessary. These can be difficult judgement decisions and close follow up as medications are chosen and doses are adjusted would be wise.

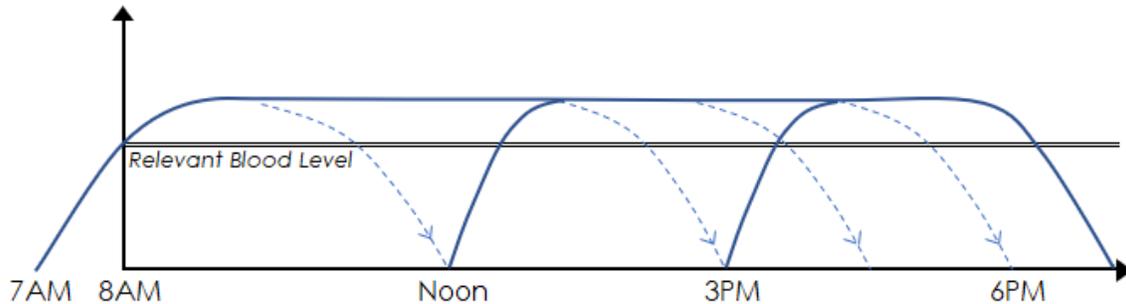
Effects of the stimulant medications are somewhat obvious. They include improved attention or focus, diminished distractibility, diminished impulsivity and lessened hyperactivity. Side effects (politically charged language!) could perhaps be better referred to as anticipated non-therapeutic effects. They commonly include appetite suppression that depending on the BMI of the child at the inception of the therapy can be a blessing or a curse. Either way, careful observation of weight changes, especially at the inception of therapy, is important. There can be slowing of linear growth but not commonly. When it occurs, it tends to attenuate with time and adult height is generally not affected.

Headaches can be an unintended consequence, and if it is common, especially in the couple of hours following medication administration suggests the prescribed dose may be excessive. Increased heart rate and elevation of blood pressure can occur, but again, not commonly. Sleep disruption can be a consequence especially if there is a midday or afternoon dose in the medication plan. This is variable, and on occasion sleep can be improved if marked attentional problems (especially combined presentation of symptoms) are more effectively managed by appropriate stimulant doses as the morning dose is "wearing off". Emotional lability as medication doses "wear off" is not uncommon and is often managed by using a small dose of stimulant as the morning dose is wearing off. One very uncommon side effect includes priapism (persistent erection) and like the erectile dysfunction ads on television say about those products, represents a medical emergency. If there is a family history or past medical history of cardiac dysrhythmia or unexplained sudden cardiac death in the family not due to coronary artery disease, cardiac evaluation before initiation of therapy is warranted.

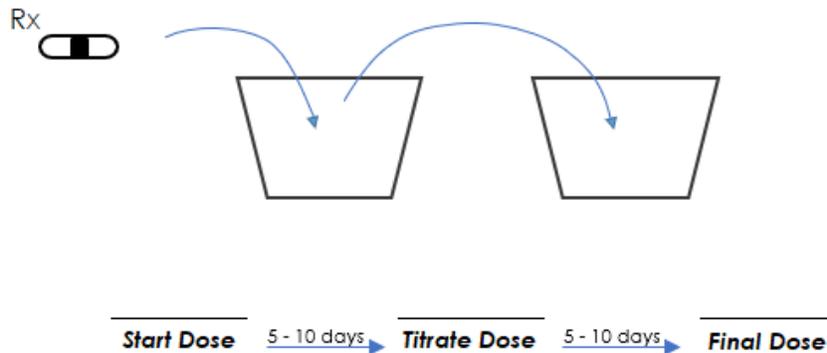
The dosage required for control of symptoms can be estimated but varies considerably among children of similar weight and age. Each child is a relative individual in dosing decisions as a result. What can be said is that the minimum effective dose is the prescribing goal to be strived for in each child. One rule of thumb with methylphenidate is to expect clinical effects to be seen at doses between 0.3 mg/kg and 0.6 mg/kg. Clinical effect will likely occur at about half that dose with dexamethylphenidate (Focalin). As you can see, the expected effective dose observed in large numbers of patients is highly variable. Medications should generally be started at doses estimated by the prescriber to be below effective (therapeutic) doses and gradually increased (titrated) upward until effective doses are being administered. My personal preference is that about two to three weeks (ten to fifteen class days) be the minimum interval between dose increases. In this way, the child has a chance to perform academically on a certain dose, the parents and the teachers have a chance to observe and judge the efficacy of a certain dose before the decision is made to increase to the next higher dose. "Vanderbilt rating forms" can serve as a potentially objective measure of improvement of behavior in the classroom. It is reasonable to complete parent and teacher "follow-up" forms before increasing to the next higher dose of medication. Generally, dose increases where possible, should be a small percentage of the existing dose. In this way, the dose increases are gentle and the probability of using more medication than is desirable is lessened.

There are two primary tasks for parents and teachers as the doses are gradually titrated upward (increased). The first task is to determine, by gradual titration, what dose is needed to optimally impact the child's behavior in the classroom in the earlier part of the academic day. Let's say, what dose is necessary to impact behavior optimally until midday. Once that decision is made, the second task would be to determine how long the classroom behavior is controlled by medication. Once the second task is completed, a decision can be made regarding the potential of a second daily dose of medication. This second dose is aimed either at controlling behavior in the latter part of the academic day or for the completion of homework (or both).

- ① What dose is needed?      ② How long does the dose last?



Use the following below as an aid in fractionating capsule doses:



The following should occur simultaneously: (1) *Improved Behavior*  
(2) *Decreased Appetite*

In the first task, families should expect classroom behavior (therapeutic effect) and appetite suppression (anticipated non-therapeutic effect) to occur in concert with one another. If appetite suppression (lunch) is the only change and the doses being used are in the upper range of the expected likely range, the diagnosis of ADHD, may need to be questioned. It is possible that the other major class of stimulant will be effective and a trial of one of those medications may be warranted. If the only change is notably improved classroom behavior and no appetite suppression (lunch) takes place, the possibility exists that this is just "placebo" effect. Simply put, "placebo effect" is improved behavior simply because the child knows medication to improve academic outcome is being prescribed and therefore he struggles to fulfill that expectation. "Placebo effect" is not sustainable, and after a few weeks, the behavior is likely to return to "baseline". In placebo effect, the likely explanation is dose inadequacy. Dose should be incrementally increased until the desired classroom



effect is sustained (longer term) and most likely, appetite suppression will be present at that dose as an anticipated non-therapeutic effect. Once again, expect both the therapeutic effect (behavioral change) and this anticipated non-therapeutic effect (appetite suppression) tend to occur in concert with one another. If you don't see these effects occurring together, you should be suspicious about the accuracy of the diagnosis (appetite suppression only) or a sub-therapeutic dose of the medication (placebo effect).

In the second task, the family, usually working in concert with the teacher(s), will be determining the effective duration of control of the specific symptoms of ADHD in that child. Some children metabolize medications with such speed that by mid-day, the effects (in the early part of the day) of an effective dose of stimulant medication will have been exhausted. In that situation, the prescribing of a second dose of long acting medication may be an option to control ADHD symptoms for the rest of the academic day and through the homework hours. For other children, the medication can control ADHD symptoms during the entire academic day and a shorter acting stimulant to control after school extra-curricular activities and homework ADHD symptoms may be beneficial. As these children age into adolescence and begin to drive and make other important decisions with potentially life changing consequences, control of the core symptoms of ADHD can become a dawn to after dark necessity for optimum outcome inside and outside the classroom. Children who need a second daily dose may experience appetite suppression at both lunch and dinner. This sort of nutritional intrusion may require creative planning and perhaps the professional advice of a registered dietician to maintain weight and nutritional adequacy.

A word or two about complementary and alternative medications (CAM) in this application. Generally speaking, the non-traditional vitamin approach, when the scientific literature is searched and evaluated, has proven to be no more successful than placebo. In addition to delaying a more effective approach, depending on the vitamins used and doses administered, outright toxicity might be a consequence. In recent years, there has come a "medical food" that supplements omega 3 and 6 fatty acids that is "trendy" and has garnered a certain amount of interest in the therapy of ADHD. Also, when the science of efficacy is evaluated, improvement over placebo has not been the conclusion of scientists looking at this issue with impartial calculation.

As complex and logistically challenging as all this may be, just when an accurate diagnosis has been arrived at and a therapeutic plan that could include medication has been implemented, insurance considerations may obstruct a new or existing pharmaceutical plan. This is big business and many of these medications are quite expensive. Pre-authorization, plan exclusions, deductibles, "tiered" copays are all operative here and can significantly impact the out-of-pocket expenses the family may face. Where possible, investigate mail order and ninety-day options as potential cost savers. These medications are usually prescribed for long terms and any cost savings can begin to "add-up" after time. Investigate your medical health benefits options at work and try to "do the math" and consider that a more expensive benefits package could assure continued access to a currently successful medication and ultimately save money by reducing the tier of copay to which you are subjected. It's for the long haul, so your planning and energy may pay benefits in many ways. Be as proactive as possible.

In Texas, stimulant medication of all types are controlled substances and are typically handwritten on prescribing pads issued by the Texas Department of Public Safety. They are not to be mailed, faxed or emailed no matter the inconvenience that creates. Diversion of the medication is unlawful. Beyond these restrictions, the other options available to you by your insurer and pharmacy typically apply.



In the early experience with medication, as choices of doses and dose intervals are being changed, frequent office visits to review and optimize care decisions should be expected. As dose stabilization takes place and non-therapeutic consequences (where they occur) are reviewed and managed, the interval between visits can become as infrequent as months to semiannually.

Refills for the stimulants in our office, because of the controlled substances issues, is not an automated process orchestrated by the pharmacy. Again, more frustrating inconveniences, so take the time to interface with one of our office's phone triage nurses and request refills detailing the medication,

dosage, frequency of administration and desired number of days to be prescribed. When you do this, please give the office a few days to write the prescriptions so there is no inconvenient waiting on your part as we review your child's records, complete prescriptions and notify you of their readiness.

So, at the end of the day, genuine progress in helping young people with attentional issues remains a long-term endeavor involving parents, families, educators and other mentors, psychologists, physicians and the young person in an intricate effort to maximally capitalize on potential. The dynamic ("fluid") nature of the challenges makes it imperative that at intervals, the therapeutic plan, including all the adaptations at home and school or work and recreation be reviewed and where needed, revised to meet the latest needs the patient faces. It is likely that the transition into middle school and again into high school will be met with a need to review the behavioral and pharmacologic interventions to assure the best possible transition takes place.