

ADHD MEDICATION INFORMATION SHEET FOR PARENTS AND TEACHERS

Medication was first used to treat children with behavior disorders in 1937. Today, it is the most common treatment for children with attention deficit hyperactivity disorder (ADHD). About 2 to 2.5% of all elementary-aged children in North America have received or are currently receiving medication for the treatment of ADHD. As many as 90% of children with ADHD receive medication at some time, mostly psychostimulant medication, which has led many people to describe stimulant medication as the treatment of choice for ADHD. The reason that medication is prescribed for so many children with ADHD is that many scientific studies have shown that medication--particularly the psychostimulants (e.g., amphetamine compounds, methylphenidate, pemoline)--is effective in helping children with ADHD in the short-term. However, current recommendations are that medication be used only as part of a comprehensive treatment plan that includes behavioral interventions at home and appropriate behavioral and psychoeducational programs at school. Other home and school treatments should begin before medication is used.

Stimulant Medications

Methylphenidate (Ritalin), amphetamine compounds (Dexedrine, Adderall), and pemoline (Cylert) are prescribed much more often than other drugs for ADHD, with methylphenidate being used most often among these stimulant medications. The behavioral effects of these drugs can be seen 30 minutes (Ritalin, Dexedrine, Adderall) to 60 minutes (Cylert) after ingestion, and the drugs are typically in effect for 3–5 hours (methylphenidate), 4-8 hours (amphetamine compounds) or 8–10 hours (Cylert). A slow-release form of Ritalin is also available, and its effects can last as long as those of Cylert, but the slow release version of Ritalin does not work as consistently well as the short-acting form of Ritalin. Newly-released long-acting forms of methylphenidate, Concerta and Metadate-CD, last 12 and 8 hours, respectively. A timed-release form of Dexedrine is also available, (Dexedrine Spansule), and its effects last for 8 to 10 hours. A 12-hour version of Adderall, Adderall-XR, is now available. Due to the duration of the behavioral effects, Ritalin, generic methylphenidate and Dexedrine are usually given two or three times a day, whereas Cylert, slow-release Ritalin, Concerta, and Dexedrine Spansules are given only once. Adderall is given once in the morning to cover an entire school day, with a lower dose in the late afternoon if necessary to help evening behavior. Some of these medications are available in generic forms, which are less expensive than the name brands (Ritalin is methylphenidate, for example). The generic forms work as effectively as the name brands.

Beneficial Effects

For about two-thirds to three-quarters of medicated ADHD children, stimulants improve their classroom behavior and performance, including reduced class disruption, increased on-task behavior, increased compliance with teacher requests, improved peer interactions (e.g., decreased aggression), and improved daily academic productivity. For example, medication has been shown to improve the amount of assigned seatwork a child finishes, without loss of accuracy. Laboratory (e.g., computerized) tasks of attention and learning have also routinely shown positive effects of medication. Medication also increases ADHD children's persistence in difficult academic tasks. When a child is a positive responder to stimulants, these improvements are generally quite large and immediate. These beneficial effects extend to domains of children's lives outside of the classroom, including the home setting (for example, improving compliance with parent requests) and recreational settings (for example, improving behavior and attention in recreational activities such as baseball). However, there are very large individual differences in the degree of responsiveness that ADHD children show to stimulant drugs. Some children show very large improvements, while others improve little or not at all. Thus, medication effects need to be carefully measured to make certain that each child receives the appropriate medication and the appropriate dose.

Most of the beneficial effects of stimulants for most children are obtained with low to moderate doses of medication--less than 10 mg of methylphenidate taken twice per day, for example. Many doctors will use the child's weight to determine dose and will use amounts around .3 mg of methylphenidate per kilogram of the child's weight per dose. Dexedrine and Adderall are twice as potent as methylphenidate/Ritalin, so only half as much medication needs to be used. Cylert is less potent, and the morning dose of Cylert is typically 4 to 6 times higher than the morning dose of methylphenidate (for example, a child who takes 10 mg of Ritalin in the morning would need 40 to 60 mg of Cylert but only 5 mg of Dexedrine or Adderall in the morning to achieve the same effect). If desired, Adderall can be given in the same morning dose as methylphenidate and the noon dose can be skipped, providing school-day coverage from a single morning dose. When doses are increased beyond these low to moderate amounts, relatively little additional benefit is obtained for most children. For example, a child who has 15 non-compliances per day to teacher commands might drop to 5 non-compliances when taking 10 mg of Adderall once in the morning. However, doubling the dose of the drug will likely produce a further reduction of only two non-compliances. Further, not all children respond the same to the different stimulant drugs. A child who does not respond particularly well to methylphenidate may improve with Adderall, and vice versa. Thus, both major stimulants should be tried with a child before selecting one for long-term treatment. The physician's goal with these medications is usually to use the lowest possible dose that produces improved behavior without side effects.

Most of the studies that have documented these beneficial effects have been conducted with elementary-aged ADHD boys with the inattention/impulsivity/hyperactivity type of ADHD. The beneficial effects of stimulants that are seen with these boys are also seen in boys with predominately inattentive type ADHD, as well as with girls. The positive effects are also evident in preschoolers, adolescents, and adults with ADHD, although the effects on average are somewhat smaller than with elementary-aged children. The fact that benefits from stimulant medications continue in adolescence and adulthood suggests that stimulants can be used as long as they appear to be needed for an individual (that is, as long as the individual is having difficulties that the drugs improve).

Medication should be prescribed for the times of day and the days of the week when a child has problems. If a child has difficulties only in school, for example, then he or she needs medication only during school hours. If a child has difficulties after school or on weekends, (for example with peers around the neighborhood) medication can be used during these times in addition to school hours. If a child has no problems during vacations, medication is not needed.

Importantly, however, behavioral and academic improvements last for only as long as the medication is given. There are no proven long-term benefits of psychostimulant drugs as the sole treatment for ADHD. For example, studies have shown that if medication is the only treatment a child receives, he or she will not show any more improvement as a teenager or young adult than a child who never received treatment. The current prevailing professional belief is that psychosocial (e.g., parent training) and psychoeducational (e.g., classroom behavioral treatment) treatments must be given along with medication to cause long-term improvement for children with ADHD. This is one of the main reasons that medication is not recommended as the only form of treatment for ADHD. Instead, it is recommended only as an additional treatment for children who are already receiving behavior modification and/or educational interventions.

Adverse Effects

The benefits of medication must always outweigh any adverse effects that the medication causes. Loss-of-appetite and insomnia are the most common adverse reactions to stimulant drugs. Other reactions that can occur include irritability, nausea, dizziness, stomachaches, headaches, rapid heartbeat, elevated blood pressure, skin rashes, anxiety, drowsiness, lip smacking, cheek biting, nail biting, muscle twitches or tics, and social withdrawal (e.g., interacting less with other people). Rarely, hallucinations and psychotic episodes have been reported, but these side effects usually appear only at very high doses. The stimulants can also cause zombie-like problems with thinking in some children that may actually decrease their academic performance.

Many of these symptoms either disappear within a few days or can be controlled by reducing the dosage of medication. In more severe cases, stopping medication causes the symptoms to disappear. A reduction in normal height and/or weight gain has often been reported with long-term stimulant treatment. There is disagreement about the overall long-term effects, however, as some reports show that children have a period of catch-up growth after the medication is discontinued. The current medical practice of using relatively low dosages, giving medication only for school hours, and minimizing medication on weekends or vacations, is intended to reduce this problem.

There is some evidence that Ritalin at high doses lowers the seizure threshold in children with a history of seizures or children with abnormal EEGs without seizure activity. However, scientific studies show no increased seizure activity on the dosages of stimulants that are usually used in treatment. The manufacturer reports that the safety of using anticonvulsants and Ritalin together has not been established, but scientific studies show that it is safe. If a child is currently receiving anticonvulsant medication, the doctor who is treating the child must be consulted before giving one of the stimulants.

There has also been a suggestion that in rare cases stimulants can cause or worsen motor tics and Tourette's Syndrome (severe motor and vocal tics) in children with a history of these problems. However, careful studies have shown that moderate doses of stimulants do not cause increased motor tics in many children. Therefore, stimulant medication may be used with a child with tics, but it should be watched very carefully. Concern has recently been expressed about possible liver toxicity with Cylert (pemoline). Abbott Laboratories (the manufacturer of Cylert) recently recommended that serious complications, including death, had a very low rate of occurrence, but that because of them, pemoline should usually not be used as the stimulant of first or second choice in treatment for ADHD.

Some media claims about negative effects of these medications are untrue. For example, stimulants do not cause children to become suicidal or homicidal. Similarly, children with ADHD do not become psychologically reliant upon their medication or physically addicted to it, and it does not appear to cause long-term problems with drug use. However, stimulants are potentially abusable drugs. Most physicians have concern about prescribing stimulants to adolescents who may also have developing drug problems. In such cases, Cylert (pemoline), which is not an abusable drug, may be the stimulant of choice.

Other Medications

Besides the stimulant medications, there are no medications that are currently approved by the FDA to treat ADHD. Although many other medications are used (for example, clonidine, various antidepressants), their beneficial effects on ADHD symptoms and impairment are considerably less than what is obtained with the stimulant drugs, and their risks from both minor and serious side effects are often much higher. In addition, combinations of these medications with the stimulants are not approved, and the safe use of combination drug approaches has not been demonstrated. Because these other medications do not have proven safety and because of their limited beneficial effects, it is widely recommended that an ADHD child be tried on all forms of stimulant medication before being treated with any other class of drugs. If a child fails to respond to all forms of stimulant drug or has prohibitive side effects to all stimulants, he or she may derive some benefit from another medication, but the risks associated with the other medication should be carefully evaluated against the benefits obtained.

Determining the Most Appropriate Medication and Dose

As noted above, there are large differences in the way individuals respond to medications, including stimulant medications. Approximately one third to one quarter of ADHD children do not show positive responses to stimulants. These children either have no response or have adverse responses to medication. Some children respond positively in all the areas that we highlighted above and show no side effects, while others may improve only in some areas and may have adverse effects that mean they can not tolerate medication. Some children respond best to one of the stimulants, while others respond better to another, a reason why a child should be tried on all types of stimulants before it is assumed that he/she is a nonresponder to stimulants.

It would obviously be helpful if there were a way to test children to tell how they would respond to medication before trying it. Unfortunately, there is currently no way to predict in advance which children will respond positively to these medications and which children will have adverse responses. To find out if a child should take stimulant medication as part of treatment, he or she should participate in a brief trial period (e.g., 3 to 6 weeks) in which he or she receives medication, and its effects are carefully measured at school and at home, using objective measures and parent and teacher ratings of improvement and side effects. If placebo pills are also used in the trial period, the doctor can be confident that the actual medication effects, and not children's and parents' beliefs about medication, are being measured. It is important in such trials to be measuring precisely the area in which the child is having difficulties. For example, by using a child's Daily Report Card target behaviors at school (e.g., finishes assignments within defined time with 80% accuracy) as a measure of drug improvement, parents can be certain that the medication is improving the very behaviors that their child's teacher considers most important. At the end of the trial period, the treating professionals can examine the information gathered and determine (a) whether the child improved in areas that were important for the child, (b) whether negative side effects were shown, and (c) the lowest dose that maximized improvement without side effects. If such an assessment is conducted while the child is receiving concurrent behavioral treatment, then the results of the evaluation tell whether medication causes improvement above and beyond the other treatments that the child is receiving and whether medication should be a part of the child's ongoing treatment. Typically, lower dosages of medication are needed if concurrent behavioral treatments are being conducted with a child, compared to when a child is treated only by medication alone.