

Complete Guide to ADHD Medications

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Children with attention-deficit hyperactivity disorder (ADHD) find it unusually difficult to concentrate on tasks, to pay attention, to sit still and to control impulsive behavior. Stimulant medication has been shown to be the most effective treatment for reducing these symptoms. This guide explains how ADHD medications work, how different kinds of medication might affect your child and what side effects he might experience.

Medications for ADHD

Stimulants are the best and most common type of medication used to treat *ADHD*.

ADHD

see attention-deficit hyperactivity disorder

There are only two stimulant medications, methylphenidate (the active ingredient in Ritalin, Concerta and other formulations) and amphetamine (the active ingredient in Adderall, Vyvanse and other formulations). Both medications are available as short-acting medications and in longer acting preparations.

The two types of medications (methylphenidate and amphetamine) are equally effective and have the same benefits and the same risks. While most people will respond equally well to either medication, there are a few people who respond better to one versus the other. Typically, if you start treatment with one of these medications and it doesn't work well or is not tolerated, you should probably try the other medication.

Methylphenidate Medications

Ritalin is a short-acting formulation of methylphenidate that lasts about 3-4 hours. **Focalin** is another form of methylphenidate that also lasts about 4 hours. Both of these medications begin to work about 30-45 minutes after taking them. For children who have trouble swallowing pills, this medication can be crushed and mixed with foods. There is also a liquid and a chewable tablet form of the short-acting methylphenidate.

Other preparations of methylphenidate have been created to release the medication over greater period of time, extending the duration of the effect of the medication. This is of great benefit when trying to provide a response that lasts through a school day (typically 6-8 hours). Some of these compounds take effect as quickly as the short-acting forms of these medications. These compounds include:

- **Concerta** is one of the longest-acting methylphenidate medications on the market, lasting 8 to 12 hours. Concerta can't be chewed or opened. It has to be swallowed whole in order for it to work the way it was designed. This can be a problem for some kids.
- **Ritalin-LA and Metadate CD** are capsules that are filled with medication. These medications are very similar in that they both last about 6-8 hours. What's good about these is that for kids who can't swallow pills, you can open up the capsule and sprinkle it on food (i.e., yogurt, Nutella, applesauce, etc.).
- **Apertio XR and Focalin XR** are also capsules filled with medication that can be opened and mixed with food. They typically work longer than Ritalin LA or MetadateCD.

CD

see conduct disorder

- **Quillivant XR** is a long-acting formulation of methylphenidate in liquid form, which makes it a good alternative for kids who have trouble swallowing capsules and can't tolerate beads, either. The liquid formulation may also allow more precise dose adjustment or "titration."
- **Quillichew ER** is a chewable long-acting formulation of methylphenidate that can last up to 8 hours.
- **Daytrana** is a methylphenidate patch. It's another option for kids who can't swallow pills. You can wear the patch for up to 9 hours and often get another hour's worth of response after the patch is removed. However, the patch can often take 1-2 hours to start working.

Amphetamine Medications

Adderall, Evekeo, Zenedi and Dexedrine are all short-acting forms of amphetamines, that take effect about 30-45 minutes after taking them and they are effective for 3-4 hours. Amphetamines tend to be slightly more potent than methylphenidate and last a little longer, but in general the effects are similar to methylphenidate.

As with methylphenidate, some preparations of amphetamines have been created to release the medication over a greater period of time, extending the duration of the effect of the medication. This is of great benefit when trying to provide a response that

lasts through a school day (typically 6-8 hours). Some of these compounds take effect as quickly as the short-acting forms of these medications. These compounds include:

- **Adderall XR** is the longer-lasting form of Adderall and was designed to be effective for 10-12 hours. Like Metadate CD and Ritalin LA, it is a capsule with beads and can be opened and mixed with food.
- **Vyvanse** is amphetamine plus an extra compound called lysine, which attaches itself to the amphetamine, creating an extra step that the body has to go through to make it active. Vyvanse can last very long — up to 14 hours — but may take a little longer in the morning to start working.
- **Dexedrine Spansule** is the long-acting form of Dexedrine and typically lasts about 6-8 hours.
- **Dynavel XR** is a long-acting liquid form of amphetamine. It can have an effect that lasts as long as 10-12 hours.
- **Adzenys XR-ODT** is a tablet that dissolves in your mouth and doesn't need to be swallowed. It has a similar duration of response as Adderall XR.

Potential Benefits

These medications can reduce the troublesome symptoms of ADHD. Thus, kids tend to be less hyperactive, less impulsive, more focused and less distractible when the medications work. These medications however do not treat any type of learned behavior or other types of learning problems.

Side Effects of ADHD Medications

Loss of Appetite

This is the most common side effect of these medications. The loss of appetite happens when the meds are effective and wears off just like the benefits of the medication. Kids may be very hungry when the meds wear off and if they haven't eaten they may also be irritable and grouchy. This is typically a manageable problem, but we suggest that this issue be discussed with the doctor who prescribes the medication.

Sleep Problems

Kids who take this medication can experience troubles falling asleep. This is usually a mild change and it tends to occur more in kids who are younger and who might have had issues with falling asleep before they started the medication.

Many things can interfere with falling asleep. So it also is important to figure out whether any of those things are present (worry about school or friends, excess screen time before bed, etc.) when you're evaluating the effects of medication.

Problems falling asleep can sometimes get better over time and may be helped by changing either the time or type of the medication that is given. For example, if a child is taking a short-acting formula, it may mean that he is taking a second or third dose too late in the day, so it hasn't worn off by bedtime.

Growth

In spite of concerns that have been voiced regarding growth and stimulants, a recent well-done clinical study showed that neither ADHD nor treatment with stimulants was associated in a change in how fast kids grow during the maximum growth period or in final adult height. Combined with other studies, it seems clear that stimulant treatment has little to no impact on growth.

Wear-Off Effects, or 'Rebound'

A small minority of children experience behavioral changes as their ADHD medication wears off, typically at the end of the school day. Some parents call it "rebound" but the term is a bit misleading. They can seem more irritable or emotional, but it is usually mild. It is important to make sure that they aren't simply hungry from having missed the midday meal. This may be connected to the medication level dropping, and strategies that create a more gradual decrease in the medication level may help take it away, such as adding a smaller dose a half hour before the medication wears off.

Tics

About 10% of kids with ADHD will have tics whether or not they take medications, so there are a lot of kids who have both. Tics usually start between 6 and 8 years of age, which is often when kids first start taking a medication for ADHD. Tics also come and go over time. The best we know from a series of studies is that stimulants don't cause tics, and can be used to treat children with both ADHD and tics. But this should be monitored during treatment

If your child has tics or develops tics during treatment, you could discuss trying a non-stimulant medication, which affects the brain in a different way.

Mood Changes

When a stimulant dose is too high for a child he may begin to look sedated or zombie-like, or tearful and irritable. If this happens the prescription should be adjusted until the right dose is found: one in which the child gets the benefits of the medication with the

least possible side effects.

But there is a small subset of kids with ADHD who seem to get moody and irritable when they take stimulant medications, even if they are taking the best possible dose. It usually happens right away, as soon as they start taking the medication, and goes away immediately when they stop taking it.

If this happens with your child, it may help to switch to a different stimulant, since some kids react differently to those based on methylphenidate and those based on amphetamine. If that doesn't work, a non-stimulant medication is a possibility.

Of course it's important to keep in mind that kids who have ADHD can also develop depression. In fact they are at a higher risk for developing *major depressive disorder*

major depressive disorder

A mood disorder characterized by periods or "episodes" of profound sadness, crying and feelings of hopelessness and helplessness. There is a high risk for suicidal thoughts and behaviors during a depressive episode. While episodes can last months or years, there are usually extended periods of relative normal mood (euthymia). This is also known as "clinical depression."

than other kids. The good news is that kids can be safely treated for both disorders at the same time, though we don't recommend treating mood problems that are a side effect of stimulant meds with another medication.

Get charts comparing ADHD stimulant medications by form (liquid, pill, capsule, patch) and effect duration.

[Download Charts](#)

Non-Stimulant Medications for ADHD

There are two types of medications that aren't stimulants that can help alleviate symptoms of ADHD but are less likely to cause tics.

Clonidine (Catapres, Kapvay) and **guanfacine (Tenex, Intuniv)** are called alpha-adrenergic agonists, and these medications were developed to lower high blood pressure. But they are also prescribed for children with ADHD who don't tolerate stimulants well. These medications can make kids feel tired and you need to check blood pressure and heart rate while taking these medications.

Both clonidine and guanfacine are short-acting medications that require several doses each day, but they come in a longer acting version (Kapvay and Intuniv). They are also sometimes used to treat tics.

Atomoxetine (Strattera) is in a class of drugs called norepinephrine *reuptake inhibitors*.

reuptake inhibitors

Medications that increase the supply of neurotransmitters in the brain by blocking their re-absorption and rapid destruction.

Norepinephrine is a natural substance in the brain that is needed to control behavior.

Unlike the stimulants, Atomoxetine can take 4-6 weeks to take effect and has to be taken daily.

This guide was last reviewed or updated on November 2, 2023.