



Effective Health Care Program

# Treatment Options for ADHD in Children and Teens

A Review of Research for Parents and Caregivers



Agency for Healthcare Research and Quality  
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## Is This Summary Right for Me?

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### Yes, if:

- A doctor said that your child or teen has “attention deficit hyperactivity disorder” (ADHD).
- You want to know what research says about ADHD treatments for children and teens.

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### What does this summary cover?

This summary discusses the different types of treatment for ADHD. It explains what research says about how each treatment improves symptoms and the risks involved with each treatment. It can help you talk with the doctor about ADHD and your child.

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### Where does the information in this summary come from?

Researchers funded by the Agency for Healthcare Research and Quality (AHRQ), a Federal Government research agency, reviewed 223 studies on ADHD treatments published from January 1980 through May 2010. The report was reviewed by clinicians, researchers, experts, and the public. You can read the report at [www.effectivehealthcare.ahrq.gov/adhdtreatment.cfm](http://www.effectivehealthcare.ahrq.gov/adhdtreatment.cfm).



## Understanding Your Child's Condition

### What is attention deficit hyperactivity disorder (ADHD)?

ADHD is a disorder that has three different types of symptoms:

- Difficulty paying attention or focusing on certain tasks
- Being overactive (or hyperactive)
- Acting on impulse (without thinking)

Children or teens with ADHD may:

- Get distracted easily and forget things often
- Switch too quickly from one activity to the next
- Have trouble following directions
- Daydream too much
- Have trouble finishing tasks like homework or chores
- Lose toys, books, and school supplies often
- Fidget and squirm a lot
- Talk nonstop and interrupt people
- Run around a lot
- Touch and play with everything they see
- Be very impatient
- Blurt out inappropriate comments
- Have trouble controlling their emotions

Children may first develop ADHD symptoms at an early age (between 3 and 6 years old). However, ADHD is most often found and treated in elementary school (between 7 and 9 years old).

ADHD symptoms like hyperactivity may get better as a child gets older. However, symptoms may not disappear completely and may continue into adulthood.



## **How do doctors know if a child or teen has ADHD?**

There is no one medical or physical test that tells if someone has ADHD. Usually, a parent, teacher, or other adult tells the doctor about the behaviors they see. Your pediatrician or family doctor may suggest you take your child to see a qualified specialist with training and expertise in childhood development and mental health disorders.

Sometimes a child may have ADHD at the same time as other problems, such as anxiety, a learning disability, oppositional defiant disorder (a condition where children or teens argue, talk back, disobey, and defy parents, teachers, and other adults), or problems with alcohol and drugs. The doctor may check for other medical problems that might explain your child's symptoms.



## **How common is ADHD?**

ADHD is now found more often in preschool children, teens, and adults than in the past.

- About 5 percent of children worldwide show signs of inattention and hyperactivity.
- About twice as many boys have ADHD as girls.
- ADHD affects children of all races and social classes.

## Understanding Your Options

### How is ADHD treated?

It is common for children to have more than one learning and/or emotional problem. ADHD may be just one of these problems. It is important to get a full evaluation from your doctor before deciding on treatment.

There is no cure for ADHD, but there are treatments that can help improve symptoms. You may have heard about some treatments, such as changes in diet, use of supplements or vitamins, and others. There is not much research to say how well these treatments work, and they are not included in this summary. The two treatments below have much more research:



**Non-medicine  
Treatments**



**Medicines**

- Non-medicine treatments: Parental behavior training, psychosocial therapy, and school-based programs
- Medicines

Families may use both non-medicine treatments and medicines together.

## **Non-medicine Treatments**

Several types of non-medicine treatments have been used for children with ADHD. Sometimes the whole family takes part in these treatments.



### **Parental Behavior Training**

- Parental behavior training programs teach parents better ways to help their child or teen.
- Often, parents and their child attend behavior training sessions together.
- Usually one of the first things the programs focus on is creating a healthy bond between the parents and the child.
- Programs teach parents how to understand their child's behavior. Parents learn skills to help their child avoid behavior problems before they start.
- Parents can learn how to organize tasks in a way that makes it easier for their child or teen to complete them.
- Parental behavior training programs teach parents how to create a system of rewards and consequences.
- Program sessions usually take place in an office, and there may be weekly sessions for several weeks or months.
- These programs usually charge a fee. Some of these costs may be covered by your insurance.

### **Psychosocial Therapy**

- A trained therapist can talk with your child and other family members about controlling behaviors and emotions and improving social skills.
- Therapy sessions usually take place in an office. The therapist may suggest weekly sessions for several weeks, months, or years, depending on the child's needs.
- Therapists usually charge a fee for each hour of therapy. Some of these costs may be covered by your insurance.



## School-Based Programs

- The Individuals with Disabilities Education Act (IDEA) requires public schools to offer special education services to the children who qualify. Children with ADHD are often included.
- Education specialists at schools help students with ADHD succeed in learning and academics. They can work with the child, the parents, and teachers to make adjustments to the classroom, learning activities, or homework assignments.
- An individual education plan (IEP) is created with education specialists, teachers, and parents. The IEP outlines the actions taken at the school to help the child succeed. These plans are reviewed at the end of the year and should be passed on to the child's next teacher.
- These services may be free of charge for families living within the school district.



## What does research say about non-medicine treatments?

Researchers found that:

- Helping parents acquire new skills to help improve their child's behavior (parental behavior training) reduces ADHD symptoms and disruptive behavior disorders in children under 6 with ADHD.
  - Improvements in disruptive behavior lasted as long as 2 years in some studies.
  - Parents who attend more parental behavior training sessions see more improvement in their child's behavior.

There is not enough research to know:

- If combining more than one type of non-medicine treatment helps treat preschoolers with disruptive behavior disorders or ADHD.
- If behavioral or psychosocial therapy alone works beyond 12 months to improve ADHD in children 6 and older.
- If parental behavior training or school-based programs improve ADHD symptoms for more than 12 months in children 6 and older.



## Medicines

Two types of medicines treat ADHD symptoms: stimulants and nonstimulants. There are many different types and brands of these medicines. All ADHD medicines come with possible side effects. It is believed that these medicines work by changing the amount of certain chemicals in the brain.



## Medicines for ADHD

Type of Medicine	Brand Name	How Taken?	Generic Available?
<b>Stimulants</b>			
Mixed amphetamine salts	Adderall <sup>®</sup>	Pill	Yes, for some doses
	Adderall XR <sup>®</sup>	Pill	Yes, for some doses
Dextroamphetamine	Dexedrine <sup>®</sup>	Pill	Yes
Lisdexamfetamine*	Vyvanse <sup>®*</sup>	Pill	Yes
Methylphenidate	Concerta <sup>®</sup>	Pill	Yes
	Daytrana <sup>®†</sup>	Skin patch	Yes
	Focalin <sup>®*</sup>	Pill	Yes
	Focalin XR <sup>®*</sup>	Pill	Yes, for some doses
	Metadate ER <sup>®</sup>	Pill	Yes, for some doses
	Metadate CD <sup>®</sup>	Pill	Yes, for some doses
	Methylin <sup>®</sup>	Pill	Yes
	Methylin ER <sup>®</sup>	Pill	Yes, for some doses
	Ritalin <sup>®</sup>	Pill	Yes
	Ritalin LA <sup>®</sup>	Pill	Yes, for some doses
Ritalin SR <sup>®</sup>	Pill	Yes, for some doses	
<b>Nonstimulants</b>			
Atomoxetine	Strattera <sup>®</sup>	Pill	No
Clonidine hydrochloride	Kapvay <sup>®*</sup>	Pill	Yes
Guanfacine ER	Intuniv <sup>®</sup>	Pill	Yes

CD, ER, LA, SR, and XR all refer to extended-release formulas of the medicine. This means that the medicine lasts longer, and your child may not need to take as many pills each day.

\* Good-quality studies for this medicine were not available.

† Research on this medication in skin patch form was not available.

## Stimulants

- Stimulants can be short-acting (work for 4 to 6 hours) or long-acting (work for 8 to 12 hours).
- Children and teens usually tolerate these medicines well.
- They can be taken by mouth or through a skin patch.
- There are several different types of stimulants available. Your doctor may need to try several to find one that works best for your child.
- Stimulants have been studied very little in children under 6. Your doctor should check the U.S. Food and Drug Administration (FDA) label for these medicines to see if they can be used in children under 6.

## Nonstimulants

### *Atomoxetine (brand name Strattera®)*

- Atomoxetine may work by increasing a chemical called norepinephrine in the brain.
- Atomoxetine is approved by the FDA for children 6 and older and is taken by mouth.

### *Guanfacine ER (brand name Intuniv®)*

- Extended-release guanfacine interacts with the part of the brain that controls attention and impulse.
- It is approved by the FDA for children 6 and older. It is taken by mouth.





## **What does research say about how these medicines compare with one another?**

A few studies found:

- All stimulants seem to improve ADHD symptoms in children 6 and older for months to years at a time with few side effects, but there is not enough research to know for certain.
- The stimulant methylphenidate (Ritalin® and Concerta®, among others) works and is generally safe for treating ADHD symptoms, but there is not enough research to know if it is safe for preschool children (under age 6) for longer than 1 year.
- Atomoxetine (Strattera®) is safe and appears to work well to treat ADHD symptoms in children 6 and older for several years, but there is not enough research to know for certain.

There is not enough research to know:

- How well extended-release guanfacine (Intuniv®) works over several years to treat ADHD symptoms in children 6 and older.

## Common Side Effects of ADHD Medicines

These side effects are listed on the FDA labels of each medicine and in the medical research studied for this summary.

Medicine	Side Effects	Additional Information
<b>All Stimulants</b> (regular or extended-release formulas)		
Adderall® Concerta® Daytrana® Dexedrine® Focalin® Metadate® Methylin® Ritalin® Vyvance®	<ul style="list-style-type: none"> <li>■ Less appetite</li> <li>■ Worsened tic (uncontrollable movement)</li> <li>■ Difficulty falling asleep</li> <li>■ Headaches, stomach aches, and irritability</li> <li>■ Increased heart rate</li> </ul>	Children or teens with heart problems of any kind should be followed by their doctor for side effects.  Every child reacts a bit differently to stimulants, and these side effects may be mild or strong.
<b>Nonstimulants</b> (regular or extended-release formulas)		
Atomoxetine (Strattera®)	<ul style="list-style-type: none"> <li>■ Increased thoughts of suicide (more than in children not taking the medicine)</li> <li>■ Less appetite</li> <li>■ Increased heart rate</li> <li>■ Headaches, stomach aches, and irritability</li> </ul>	Parents should watch for signs of suicidal thoughts. This medicine has been associated with heart problems and may not be safe in children or teens with a history of severe heart problems.
Guanfacine (Intuniv®)	<ul style="list-style-type: none"> <li>■ Drowsiness, fatigue, and sleepiness</li> <li>■ Headaches, stomach aches, and irritability</li> <li>■ Possible heart side effects include low blood pressure, slow heart rate, or other changes in heart rhythm. These side effects may need to be followed by your doctor.</li> </ul>	This medicine should not be stopped suddenly, as doing so can increase blood pressure.

## What does research say about using non-medicine treatments and medicine together?

A few studies found:

- Stimulants, whether taken alone or while in behavioral therapy, may help children 6 and older with ADHD, but there is not enough research to know for certain.

## Making a Decision

### What should I think about when deciding?

There are several things to consider when deciding on medicine or non-medicine treatments for your child or teen with ADHD.

- If you choose to use non-medicine treatment, you will need to think about how to schedule or participate in treatment sessions with your child.
- You will also need to consider the costs of ongoing non-medicine treatments and the commitment to stay in therapy sessions or parental behavior training for a long period of time.
- When deciding whether your child should take a medicine, only you and the doctor can decide whether the benefits of any medicine are worth the risk of having a side effect.
- Each person responds differently to different medicines, and the doctor may try several medicines and doses (amounts) before finding the right one.

You and the doctor should discuss:

- If non-medicine treatments might be helpful for your child or teen.
- What kinds of non-medicine treatments are available in your area.
- The benefits and side effects of taking a medicine.
- The ways in which the doctor can help you notice any side effects so that they can be treated or so the medicine can be changed.
- The cost of each treatment option.

The National Resource Center on ADHD, a program of Children and Adults with Attention Deficit/Hyperactivity Disorder (CHADD®) supported by the Centers for Disease Control and Prevention (CDC), has information and many resources. You can reach this center online or by phone.

**[www.help4adhd.org](http://www.help4adhd.org) 1-800-233-4050**

## **What are the costs of treatment?**

The cost of non-medicine treatment programs can range between \$300 and \$2,000, depending on the individual therapist or program and the amount of time needed. There are some services available through schools and the Federal Government.

The cost to you for ADHD medicines depends on:

- Your health insurance.
- The dose (amount) of medicine your child or teen needs to take.
- Whether the medicine is available in generic form.





# Wholesale Prices of Prescription ADHD Medicines

Brand Name	Dose	Price per Month for Brand*	Generic Name	Price per Month for Generic*	
<b>Stimulants</b>					
Adderall®	5 mg	\$113	Mixed amphetamine salts	\$45	
	10 mg	\$113		\$45	
	20 mg	\$113		\$45	
	30 mg	\$113		\$45	
Adderall XR®	10 mg	\$236		\$184	
	20 mg	\$236		\$184	
	30 mg	\$236		\$184	
Concerta®	18 mg	\$197		Methylphenidate hydrochloride	\$186
	27 mg	\$202			\$191
	36 mg	\$208			\$197
	54 mg	\$226	\$214		
Daytrana® Patch (9 hour per dose)	10 mg	\$212 (all doses)	Methylphenidate	N/A	
	15 mg				
	20 mg				
	30 mg				
Dexedrine®	5 mg	N/A	Dextroamphetamine	\$206	
	10 mg	N/A		\$206	
	20 mg	N/A		\$412	
	30 mg	N/A		\$412	
Focalin®	2.5 mg	\$22	Dexmethylphenidate hydrochloride	\$20	
	5 mg	\$32		\$29	
	10 mg	\$46		\$42	
	Focalin XR®	10 mg		\$200	N/A
20 mg		\$206		N/A	
30 mg		\$216		N/A	
40 mg		\$227		N/A	
Metadate CD®	10 mg	\$171		Methylphenidate hydrochloride	\$15
	20 mg	\$171			\$26
	30 mg	\$171			\$138
	40 mg	\$234	N/A		
	50 mg	\$288	N/A		
	60 mg	\$288	N/A		

*Continued on next page*

CD, ER, LA, SR, and XR all refer to extended-release formulas of the medicine.

N/A = Price or generic product is not available.

\* Prices are the average wholesale prices listed from RED BOOK Online®. Generic prices are the middle value in the range of prices listed from different manufacturers. The actual price of the medicines may be higher or lower than the prices listed here, depending on the manufacturer used by your pharmacy.

## Wholesale Prices of Prescription ADHD Medicines (Continued)

Brand Name	Dose	Price per Month for Brand*	Generic Name	Price per Month for Generic*
<b>Stimulants</b>				
Metadate ER®	20 mg	\$53	Methylphenidate hydrochloride (continued)	N/A
Methylin®	2.5 mg	\$105		N/A
	5 mg	\$150		N/A
	10 mg	\$214		N/A
	Methylin ER®	10 mg		N/A
Ritalin®	20 mg	N/A		N/A
	5 mg	\$18		N/A
	10 mg	\$30		N/A
	20 mg	\$53		N/A
Ritalin LA®	10 mg	\$165		N/A
	20 mg	\$165		N/A
	30 mg	\$169		N/A
	40 mg	\$173		N/A
Ritalin SR®	20 mg	\$80		N/A
Vyvanse®	20–70 mg	\$205 (all doses)	Lisdexamfetamine dimesylate	N/A
<b>Nonstimulants</b>				
Intuniv®	1 mg	\$194 (all doses)	Guanfacine	\$27 (1 mg) \$40 (2 mg)
	2 mg			
	3 mg			
	4 mg			
Kapvay®	1 mg	\$104	Clonidine hydrochloride	\$8
	2 mg	N/A		\$9
	3 mg	N/A		\$16
Strattera®	By child's weight	\$206–\$241	Atomoxetine	N/A

CD, ER, LA, SR, and XR all refer to extended-release formulas of the medicine.

N/A = Price or generic product is not available.

\* Prices are the average wholesale prices listed from *RED BOOK Online*®. Generic prices are the middle value in the range of prices listed from different manufacturers. The actual price of the medicines may be higher or lower than the prices listed here, depending on the manufacturer used by your pharmacy.

## Ask your doctor

- In your opinion, would my child or teen benefit from non-medicine treatments, medicine, or both?
- What kind of changes can I expect? How long will they take to occur?
- What non-medicine treatment programs are available locally?
- Is there a therapist or program that you recommend? Why?
- How will I know if my child or teen is having a serious side effect and needs to change medicines?
- Are there any local support groups that might be able to help me?

## Other questions:

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## Write the answers here:

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## Source

The information in this summary comes from the report *Attention Deficit Hyperactivity Disorder: Effectiveness of Treatment in At-Risk Preschoolers; Long-term Effectiveness in All Ages; and Variability in Prevalence, Diagnosis, and Treatment*, October 2011.

The report was produced by the McMaster University Evidence-based Practice Center through funding by the Agency for Healthcare Research and Quality (AHRQ).

For a copy of the report or for more information about AHRQ and the Effective Health Care Program, go to [www.effectivehealthcare.ahrq.gov/adhdtreatment.cfm](http://www.effectivehealthcare.ahrq.gov/adhdtreatment.cfm). Additional information came from the MedlinePlus® Web site, a service of the National Library of Medicine and the National Institutes of Health. This site is available at [www.nlm.nih.gov/medlineplus](http://www.nlm.nih.gov/medlineplus).

This summary was prepared by the John M. Eisenberg Center for Clinical Decisions and Communications Science at Baylor College of Medicine, Houston, TX. Parents and caregivers of children or teens with ADHD reviewed this summary.

