

# Basic Facts: What Every Clinician Should Know Before Starting a Patient on Medication

- Studies have shown that treatment for attention-deficit/hyperactivity disorder (ADHD) with medication is effective in treating the symptoms of ADHD alone or in combination with behavioral interventions.
- Stimulant medications also improve academic productivity but not cognitive abilities or academic skills.
- Stimulants can help reduce oppositional, aggressive, impulsive, and delinquent behaviors in some children.
- Several types of medications are Food and Drug Administration (FDA)-approved for the treatment of ADHD.
  - Stimulant medications: methylphenidate, dexamethylphenidate, dextroamphetamine, mixed amphetamine salts, lisdexamfetamine
  - Non-stimulant medications: atomoxetine, and extended-release guanfacine and clonidine
- When choosing which stimulant and dose to start first, consider
  - Family preference and experience with the medication, including the response of other family members, if they have taken the medication.
  - Duration of action required (approximately 4–6 hours, 6–8 hours, or 8–12 hours).
  - Whether the child is able to swallow pills whole.
  - Age of child (see “Special considerations for preschoolers” on page 3).
  - Presence and severity of comorbid conditions.
  - Whether to start with methylphenidate or amphetamines is a personal preference for families and clinicians.
- Careful titration of medication dose and monitoring of side effects are needed to find the optimal medication and dose; ie, “the best effect with the minimum side effects.”
  - Individual response to stimulants is variable, so weight-based dosing is less applicable for stimulants.
  - Start with lowest dose of stimulants but titrate up quickly (on a weekly basis) until the maximal effect is achieved, you reach the highest recommended dose, or significant adverse effects occur. Consider a set trial of 3 to 4 doses weekly over a month’s time.
  - Obtain ADHD core symptom and side effect ratings from parents and teachers at baseline (no medication) and at each dosage.
- If you reach the maximum recommended dose without noticeable improvement in symptoms, try a different stimulant medication class. Approximately 80% of children will respond to at least 1 of the 2 stimulant classes tried.
- When changing medications, be careful about the dose equivalence of different stimulant medication classes; in general, equivalent doses for dexamethylphenidate and amphetamine-based stimulants are approximately *half* of a methylphenidate dose.
- Non-stimulant medications may require 2 or more weeks to see effects, so you should titrate up more slowly than you would for stimulant medications. Obtaining follow-up rating scales is even more important than for stimulant medications because changes are more gradual.
- Managing side effects effectively can improve adherence to and satisfaction with stimulant medications.
- Common side effects to discuss with families include stomachache, headache, decreased appetite, sleep problems, and behavioral rebound. Rare side effects include dizziness or syncope, irritability, tic exacerbation, hallucinations, psychosis, mania, anxiety, depression, and aggression. “Zombieness” or overfocused behaviors is typically the result of too high a dose or a child very sensitive to medication effects.
- Many common side effects (eg, headache, stomachache, nausea) may subside after the first 1 to 2 weeks. Counseling the family to wait and see whether mild or tolerable initial side effects eventually go away can prevent unnecessary medication changes.
- Ascertaining the temporal relationship between side effect occurrence and the events of a child’s day (eg, meals, transitions to and from school and after-school activities, waking and sleeping) can provide clues about how to adjust medication timing or dosage, or suggest behavioral strategies to implement.
- Appetite suppression during the day can be addressed by maximizing caloric density, adding high-calorie bedtime snacks, and encouraging families to think about whether the child “makes up” his or her caloric intake after the stimulant effect has worn off. For children with restricted food interests or intake, consultation with a nutritionist can be very helpful.
- Delayed sleep onset may require changing the timing of medication dosage, decreasing medication duration, adding a dose of medication in the late afternoon or evening, or adding a medication to promote sleep as a last resort. Behavioral strategies, medication, and good bedtime practices are also helpful.



Medications	Brands	Initial Titration Dose	Frequency	Initial Effect	Duration in Hours	Max Dose	Available Doses
Mixed amphetamine salts	Adderall	2.5–5 mg	Every day to twice a day	20–60 min	6	40 mg	5-, 7.5-, 10-, 12.5-, 15-, 20-, and 30-mg tablets
	Adderall XR	5 mg	Every day	20–60 min	10	40 mg	5-, 10-, 15-, 20-, 25-, and 30-mg capsules
Dextroamphetamine	Dexdrine/Dextrostat	2.5 mg	2 to 3 times a day	20–60 min	4–6	40 mg	5- and (Dextrostat only) 10-mg tablets
	Dexdrine Spansule	5 mg	Every day to twice a day	60+ min	6+	40 mg	5-, 10-, and 15-mg capsules
Lisdexamfetamine	Vyvanse	20 mg	Every day	60 min	10–12	70 mg	20-, 30-, 40-, 50-, 60-, and 70-mg capsules
Methylphenidate	Concerta	18 mg	Every day	20–60 min	12	72 mg	18-, 36-, and 54-mg capsules
	Methylin	5 mg	2 to 3 times a day	20–60 min	3–5	60 mg	5-, 10-, and 20-mg tablets and liquid and chewable forms
	Daytrana	10 mg	Apply for 9 h	60 min	11–12	30 mg	10-, 15-, 20-, and 30-mg patches
	Ritalin	5 mg	2 to 3 times a day	20–60 min	3–5	60 mg	5-, 10-, and 20-mg tablets
	Ritalin LA	20 mg	Every day	20–60 min	6–8	60 mg	20-, 30-, and 40-mg capsules
	Ritalin-SR	20 mg	Every day to twice a day	1–3 h	2–6	60 mg	20-mg capsules
Dexmethylphenidate	Metadate CD	20 mg	Every day	20–60 min	6–8	60 mg	10-, 20-, 30-, 40-, 50-, and 60-mg capsules
	Focalin	2.5 mg	Twice a day	20–60 min	3–5	60 mg	2.5-, 5-, and 10-mg tablets
	Focalin XR	5 mg	Every day	20–60 min	8–12	20 mg	5-, 10-, 15-, and 20-mg capsules
Atomoxetine	Strattera	0.5 mg/kg/d then increase to 1.2 mg/kg/d	Every day to twice a day	1–2 wk	At least 10–12 h	1.4 mg/kg	10-, 18-, 25-, 40-, 60-, 80-, and 100-mg capsules
Extended-release guanfacine	Intuniv	1 mg/d	Every day		At least 10–12 h	4 mg/d	1, 2, 3, and 4 mg
Extended-release clonidine	Kapvay	0.1 mg/d	Every day to twice a day		At least 10–12 h	0.4 mg/d	0.1 and 0.2 mg

- Set medication treatment expectations with families before starting medications.
- Discuss the potential benefits and side effects of medications, including possible cardiac effects and suicidal ideation (in the case of atomoxetine) (it often helps to ask parents what they have heard or are most concerned about).
- Discuss how you will try to match the best medication and dose to the child; this might take some time and require trial and error with several different medications or doses before finding

the best fit. There is currently no way to predict how a child will respond to any given medication.

- Emphasize how you will rely on parent and teacher feedback using the NICHQ Vanderbilt follow-up forms to make decisions about medication adjustments.
- Involve the child or adolescent during this discussion by emphasizing the importance of reporting how he or she feels while taking the medication.



- Make sure the family understands how and when to communicate with you about any medication-related concerns.
- Special considerations for preschoolers
  - Behavioral interventions such as parent training programs should be used as initial treatment for preschool-aged children.
  - Because preschool-aged children have slower metabolic rates, lower doses (eg, methylphenidate, 1.25–7.5 mg) and less frequent dosing (every day vs twice a day) are needed (ie, “start low, go slow”).
  - The Preschool ADHD Treatment Study showed that while stimulants do reduce ADHD symptom scores in preschoolers, the effects were less than for school-aged children on the same medication.
  - Preschoolers may experience a different adverse event profile, with emotional outbursts, decreased appetite, difficulty falling asleep, repetitive behaviors or thoughts, and irritability being most commonly reported.
- General medication initiation follow-up plan
  - Obtain baseline parent and teacher NICHQ Vanderbilt assessments, height, weight, blood pressure, and heart rate; obtain a history and family history of cardiac problems and unexplained sudden death in family members; assess preexisting symptoms that could be confused with medication side effects (eg, routine headaches, stomachaches, sleep patterns).
  - Week 1: parent and teacher NICHQ Vanderbilt assessments, response to medication, report of side effects.
  - Week 2: parent and teacher NICHQ Vanderbilt assessments, response to medication, report of side effects; an in-person visit can be helpful for discussing emotional status and obtaining heart rate, blood pressure, and weight.
  - Week 3: parent and teacher NICHQ Vanderbilt assessments, response to medication, report of side effects.
  - Week 4: in-person visit, parent and teacher NICHQ Vanderbilt assessments, response to medication, report of side effects, heart rate, blood pressure, weight, emotional status, and review of the effect of the medication on target goals.
- Subsequent follow-up plan
  - Visit frequency depends on child’s needs, but monthly until determining the optimal treatment and then at least every 3 to 6 months.
  - Obtain parent and teacher NICHQ Vanderbilt assessments, report of side effects, heart rate, blood pressure, weight, and emotional status at every in-person visit.
  - Between visits, suggest obtaining parent and teacher NICHQ Vanderbilt assessments every 1 to 2 months until stable.

## Resources

Gephart HR, Leslie LK. ADHD pharmacotherapy: prescribe with safety in mind and monitor results with vigilance. *Contemp Pediatr.* 2006;23(12):46–54

Greenhill L, Kollins S, Abikoff H, et al. Efficacy and safety of immediate-release methylphenidate treatment for preschoolers with ADHD. *J Am Acad Child Adolesc Psychiatry.* 2006;45(11):1284–1293

For individual FDA medication guides, go to [www.fda.gov/Drugs/DrugSafety/UCM085729](http://www.fda.gov/Drugs/DrugSafety/UCM085729).

*ADHD Parents Medication Guide* from the American Academy of Child & Adolescent Psychiatry and the American Psychiatric Association ([www.parentsmedguide.org/ParentGuide\\_English.pdf](http://www.parentsmedguide.org/ParentGuide_English.pdf)).

Note: Drugs listed on this tool do not appear in any order of importance. The appearance of the names American Academy of Pediatrics, Quality Improvement Innovation Network, and National Initiative for Children’s Healthcare Quality does not imply endorsement of any product or service. Every effort has been made to ensure that the drug selection and dosage set forth in this text are in accordance with the current recommendations and practice at the time of publication. It is the responsibility of the health care provider to check the package insert of each drug for any change in indications and dosage and for added warnings and precautions.

The recommendations in this publication do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate. Original document included as part of *Caring for Children With ADHD: A Resource Toolkit for Clinicians*, 2nd Edition. Copyright © 2012 American Academy of Pediatrics. All Rights Reserved. The American Academy of Pediatrics does not review or endorse any modifications made to this document and in no event shall the AAP be liable for any such changes.

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