

# Implementing AHRQ Effective Health Care Reviews

*Helping Clinicians Make Better Treatment Choices*

## ADHD Interventions in Children Younger Than Six Years

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The Agency for Healthcare Research and Quality (AHRQ) conducts the Effective Health Care Program as part of its mission to organize knowledge and make it available to inform decisions about health care. A key clinical question based on the AHRQ Effective Health Care Program review is presented, followed by an evidence-based answer and an interpretation that will help guide clinicians in making treatment decisions. For the full review, clinician summary, consumer summary, and CME activity, go to <http://www.effectivehealthcare.ahrq.gov/adhdtreatment.cfm>.

A collection of Implementing AHRQ Effective Health Care Reviews published in *AFP* is available at <http://www.aafp.org/afp/ahrq>.

**CME** This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz on page 227.

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### Key Clinical Issue

What are the potential benefits and adverse effects associated with treatments for attention-deficit/hyperactivity disorder (ADHD) in preschool-aged children (younger than six years)?

### Evidence-Based Answer

Parent behavior training is an efficacious treatment for preschoolers with disruptive behavior disorders and ADHD symptoms, with no reported adverse effects. Parents who attend more training sessions see greater improvement in their child's behavior. Long-term follow-up studies suggest that the benefits can be maintained for at least six months and for up to two years. The psychostimulant methylphenidate is efficacious for treatment of ADHD symptoms in preschoolers, but is associated with more reports of adverse effects than when used in elementary school-aged children. Evidence is insufficient to determine if school-based interventions are effective for children younger than six years, and there are very limited data about the use of ADHD medications other than methylphenidate. For both preschoolers and children six years and older, long-term effectiveness and adverse effects are not well studied. (Strength of Recommendation: B, based on inconsistent or limited-quality patient-oriented evidence.)

### Practice Pointers

ADHD is characterized by inattention, overactivity, and impulsivity. To meet *Diagnostic and Statistical Manual of Mental Disorders*, 5th ed., criteria, ADHD symptoms must present before 12 years of age and occur in at least two settings (e.g., school and home).<sup>1</sup> An estimated 2% to 6% of preschoolers meet criteria for ADHD.<sup>2-4</sup>

Preschoolers with ADHD commonly present with oppositional noncompliant behaviors, temper tantrums, and aggression. These children may be given the more general diagnosis of disruptive behavior disorder, which includes oppositional defiant disorder and conduct disorder in addition to ADHD. Preschoolers with ADHD are more likely to be suspended from school or day care because of disruptive behavior. There is increasing interest in identifying children with ADHD symptoms at a younger age so they can be treated early, and to potentially avoid social and academic consequences.<sup>5</sup>

This Agency for Healthcare Research and Quality (AHRQ) review identified 28 randomized controlled trials that found that parent behavior training is efficacious for preschool-aged children with disruptive behavior disorder; eight of these studies specifically showed improvements in ADHD symptoms.<sup>6</sup> Four standardized parent behavior training programs were identified: the Triple P (Positive Parenting Program),<sup>7</sup> Webster-Stratton Incredible Years parenting program,<sup>8</sup> Parent-Child Interaction Therapy,<sup>9</sup> and New Forest Parenting Programme.<sup>10</sup> Although only the New Forest Parenting Programme was designed to specifically address ADHD symptoms, the four programs have similar therapeutic elements and are designed to help parents develop effective discipline strategies using rewards and nonpunitive consequences.

Parent-rated behavior scores showed a statistically significant improvement in the intervention group compared with the control group (standardized mean difference of  $-0.68$ , indicating a moderate to large effect).<sup>6</sup> Children whose parents attended more parent behavior training sessions had better behavioral outcomes. Eight long-term

## Clinical Bottom Line: ADHD Interventions for Children Younger Than Six Years

### Nonpharmacologic treatments

Parent behavior training is an efficacious treatment option for preschoolers with disruptive behavior disorders or ADHD symptoms. ●●●

- Benefits for children with disruptive behavior disorders are maintained at least six months and, in some studies, up to two years.
- Parents who attend more parent behavior training sessions see more improvement in their child's behavior.

Adverse effects have not been reported with parent behavior training. (Evidence strength not rated)

Where there is socioeconomic burden, a school-based intervention appears to be the primary beneficial intervention. However, benefits diminished over two years, likely because of lack of parental engagement and attendance at sessions. The evidence is insufficient to quantify the effect. ○○○

### Pharmacologic treatments

Methylphenidate is efficacious for treating ADHD symptoms, but there has been limited long-term follow-up beyond 12 months in preschoolers. ●○○

Methylphenidate can produce adverse effects (e.g., diminished growth rates, insomnia, loss of appetite, tiredness, social withdrawal, abdominal pain), and more adverse effects are reported in preschoolers than in elementary school-aged children. (Evidence strength not rated)

### Combining nonpharmacologic and pharmacologic treatments

Evidence is insufficient to know if there are additional benefits from combining different treatments. ○○○

### Strength of evidence scale

High: ●●● There are consistent results from good-quality studies. Further research is very unlikely to change the conclusions.

Moderate: ●●○ Findings are supported, but further research could change the conclusions.

Low: ●○○ There are very few studies, or existing studies are flawed.

Insufficient: ○○○ Research is either unavailable or does not permit estimation of a treatment effect.

ADHD = attention-deficit/hyperactivity disorder.

Adapted from the Agency for Healthcare Research and Quality, Effective Health Care Program. Attention deficit hyperactivity disorder: in children and adolescents. Clinician research summary. Rockville, Md.: Agency for Healthcare Research and Quality; June 2012. [http://www.effectivehealthcare.ahrq.gov/ehc/products/191/1149/adhd\\_clin\\_fin\\_to\\_post.pdf](http://www.effectivehealthcare.ahrq.gov/ehc/products/191/1149/adhd_clin_fin_to_post.pdf). Accessed April 1, 2013.

extension studies included in the AHRQ review suggested that the benefits of parent behavior training are maintained for up to two years. No adverse effects were noted.<sup>6</sup>

Eleven studies included in the AHRQ review examined the effectiveness of psychostimulants in preschool-aged children, all of which found clinically significant improvements in ADHD symptoms. However, it should be noted that most of the studies had small sample sizes and were of short duration (lasting days to weeks).<sup>6</sup>

Only one good-quality study of effectiveness and safety of methylphenidate (Ritalin) treatment for preschoolers with ADHD was identified: the Preschool ADHD Treatment Study.<sup>11</sup> This clinical trial enrolled 303 preschoolers, with 114 randomized into the treatment group. The study concluded that methylphenidate was an effective treatment for ADHD symptoms (standardized mean difference of -0.83, indicating a large

effect).<sup>11</sup> However, 30% of the children in the treatment group had moderate to severe adverse effects, such as emotional outbursts, repetitive behaviors/thoughts, difficulty falling asleep, appetite suppression, and irritability.<sup>11</sup> Overall, 11% of children discontinued methylphenidate because of adverse effects, with emotionality/irritability as the most common reason for discontinuation.<sup>12</sup> A follow-up study of the same cohort found a reduction in annual growth rates in children taking methylphenidate.<sup>13</sup>

No trials directly compare parent behavior training with methylphenidate.<sup>6</sup> Therefore, clinicians should discuss the benefits and harms of these interventions with parents. Because positive outcomes and no adverse effects have been reported with parent behavior training, it seems reasonable to discuss with parents its use as a first-line therapy for ADHD in preschool-aged children.

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