

## Management of ADHD in Preschool-Aged Children

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### Clinical Question

What is the best management approach for attention-deficit/hyperactivity disorder (ADHD) in preschool-aged children?

### Evidence-Based Answer

Behavior therapy interventions, such as parent training, are first-line treatment for ADHD in preschool-aged children (three to five years of age). (Strength of Recommendation [SOR]: B, based on a systematic review of a small number of heterogeneous randomized controlled trials [RCTs].) Medication is an option for children with moderate to severe ADHD if behavior therapy has not been effective and if the benefits outweigh the harms. (SOR: B, based on a systematic review of a small number of heterogeneous RCTs.) Alternative therapies, such as elimination diets, have limited evidence of success and should generally be avoided or used in conjunction with standard therapies. (SOR: B, based on a systematic review of a small number of heterogeneous RCTs.)

### Evidence Summary

A comprehensive systematic review examined 25 guidelines, books, RCTs, reviews, and other studies from 1981 to 2008 on behavior therapy interventions for preschool-aged children with ADHD.<sup>1</sup> Behavior therapy is the initial treatment strategy, with parent-training programs being the mainstay. Three parent-training programs have been studied extensively: the Triple P–Positive Parenting Program, which consists of 10 to 12 individual training sessions; Parent-Child Interaction Therapy, which consists of 12 to 20 individual sessions focused on live coaching of the parent while interacting with the child<sup>1</sup>; and the New Forest Parenting Programme, an eight-week program that com-

bines traditional parent training with direct observation of parent-child interactions during two sessions.<sup>2</sup>

A randomized trial of 87 children three to four years of age found decreases in parent ratings of disruptive and ADHD-related behaviors in those randomized to the Triple P–Positive Parenting Program ( $P < .01$ ).<sup>3</sup> An RCT evaluating Parent-Child Interaction Therapy in the families of 13 children three to six years of age found declines in parent ratings of ADHD-related behaviors at 12 and 24 months ( $P < .01$ ); 54% of the children were free of a formal disruptive-behavior diagnosis at 24 months.<sup>4</sup> A follow-up study of an RCT evaluating Parent-Child Interaction Therapy ( $n = 84$ ) noted benefit at 12 months, but demonstrated declines on most measures at 18 months into the range of pretreatment levels.<sup>5</sup> An RCT evaluating the New Forest Parenting Programme in the families of 78 boys three years of age found a decline in parent-reported and observed ADHD symptoms when the program was delivered by specialist nurse-therapists ( $P < .0001$ ).<sup>6</sup> Another RCT of 41 children 30 to 77 months of age found clinically significant reductions in ADHD symptoms ( $P = .008$ ).<sup>7</sup>

Two additional behavioral interventions for ADHD include classroom-based and multimodal techniques, which combine parent training with classroom-based therapy.<sup>1</sup> Classroom-based behavioral programs have not demonstrated consistent benefit on long-term follow-up.<sup>1</sup> In contrast, multimodal treatments such as the Incredible Years Program have been shown in a small number of RCTs to produce clinically significant reductions in ADHD symptoms, with results maintained at one year in some studies.<sup>1,2</sup> An RCT of 79 children three to four years of

**Table 1. Indications and Considerations for Pharmacotherapy in Preschool-Aged Children with ADHD**

**Considerations before initiating pharmacotherapy**

Consider referral to a mainstream or special-education preschool<sup>9</sup>

Decision to initiate pharmacotherapy depends on anticipated developmental delays, safety concerns, and potential school or social impairments that could result without pharmacotherapy<sup>13</sup>

Risks and benefits of pharmacotherapy must be considered individually, and it may be helpful to consult a mental health specialist with experience in treating preschool-aged children<sup>13</sup>

**Factors that reflect severe ADHD<sup>9</sup>**

Ejection or threatened ejection from a mainstream preschool or child care center

Parent on the verge of a "mental breakdown" because of the child's behavior

Parents' marriage on the verge of divorce or separation because of the child's behavior

Risk of injury to self, other children, or parents

Strong family history of ADHD

Suspected or established central nervous system risk factors (e.g., prematurity, prenatal alcohol or cocaine exposure, lead poisoning)

Symptoms interfere with needed developmental therapies (e.g., speech therapy, occupational or physical therapy)

**Indications for stimulant medication<sup>13</sup>**

Inadequate response to parent- or teacher-administered behavior therapy

Moderate to severe disturbance of functioning in home and other settings (e.g., child care, preschool)

Symptoms persist for at least nine months

*ADHD = attention-deficit/hyperactivity disorder.*

*Information from references 9 and 13.*

age who displayed signs of conduct problems and ADHD showed that those in the Incredible Years Program had significant improvements in parent-reported inattention and hyperactivity and impulsivity (52% vs. 21% among children who were not in the program;  $P < .004$ ).<sup>8</sup>

A 2011 systematic review appraised eight guidelines, websites, reviews, RCTs, and other studies on the role of medication in preschool-aged children with ADHD.<sup>9</sup> The Preschool ADHD Treatment Study (n = 303) found that immediate-release methylphenidate produced significant, moderate to large reductions in ADHD symptom scales compared with placebo.<sup>10</sup> However, 30% of parents reported adverse effects, including difficulty falling asleep, appetite decrease, emotional outbursts, repetitive behaviors and thoughts, and irritability; 11% discontinued therapy because of drug-attributed effects.<sup>11</sup> Furthermore, children who received medication during the approximately one-year study grew about

0.5 inches (1.3 cm) less and weighed about 3 lb (1.4 kg) less than expected ( $P < .0001$ ).<sup>12</sup>

Medication may be considered when behavior therapy provides an inadequate response or is difficult to access, or when adherence is low<sup>9</sup> (Table 1<sup>9,13</sup>). Few studies, however, have examined the long-term effects of medication use in children at such a young age. Therefore, physicians should generally be cautious about prescribing medication; start with low-dose, immediate-release methylphenidate, and increase the dosage only in small increments.<sup>9</sup>

Short-acting amphetamines are the only drugs approved by the U.S. Food and Drug Administration for treatment of ADHD in children three to five years of age, and should be considered when methylphenidate is not effective or tolerated.<sup>9</sup> Nonstimulant medications, such as atomoxetine, are not first-line pharmacologic treatment.<sup>9</sup> There are no studies directly comparing medication with behavioral intervention in preschool-aged children with ADHD.

A 2008 systematic review examined three alternative treatments for ADHD in preschool-aged children.<sup>14</sup> Elimination diets, especially additive-free diets, were the only intervention with evidence to support its use.<sup>14</sup> A 2004 randomized trial examined the effects of artificial food colorings and benzoate (a preservative) in children three to four years of age with hyperactivity.<sup>15</sup> Based on parental reports, there were significant increases in hyperactive behaviors during the active period vs. the placebo period ( $P < .02$ ).

Vestibular stimulation and vitamin and mineral supplementation also have limited evidence for use in the treatment of ADHD, although the studies included very few preschool-aged children (one to three).<sup>14</sup> These alternative treatments may be considered in conjunction with standard treatments, because they are relatively safe and easy to implement.<sup>14</sup>

**Recommendations from Others**

The American Academy of Pediatrics recommends parent- and/or teacher-administered behavior therapy as first-line management of ADHD in preschool-aged children.<sup>13</sup> Methylphenidate may be prescribed for second-line management in children who continue to exhibit marked impairment in function after behavior intervention.

The London-based National Institute for Health and Clinical Excellence recommends caregiver training and education programs for the management of ADHD in preschool-aged children.<sup>16</sup> The use of pharmacologic treatment is not routinely recommended for this age group. Children with persistent symptoms associated with functional impairment despite behavior therapy should be referred to a subspecialist.

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