time. Negative responses by parents, teachers, and peers to the affected child's impulsivity and hyperactivity may contribute to feelings of low self-esteem, especially in children who are also depressed (Anastopoulos, Sommer, & Schatz, 2009). Years of constant reminders by teachers and parents to behave, sit quietly, and pay attention may create a negative self-image in these children, which, in turn, can negatively affect their ability to make friends, and these effects can last into adulthood (Murphy, 2015). Thus, the possible biological influences on impulsivity, hyperactivity, and attention, combined with attempts to control these children, may lead to rejection and consequent poor self-image. An integration of the biological and psychological influences on ADHD suggests that both need to be addressed when designing effective treatments (Barkley, 2015c).

Treatment of ADHD

Treatment for ADHD has proceeded on two fronts: psychosocial and biological interventions (Smith & Shapiro, 2015). Psychosocial treatments generally focus on broader issues such as improving academic performance, decreasing disruptive behavior, and improving social skills. Typically, the goal of biological treatments is to reduce the children's impulsivity and hyperactivity and to improve their attention skills. Current thinking in this area points to using parent- and/or teacher-delivered behavioral interventions for young children before attempting medication (Subcommittee on Attention-Deficit/Hyperactivity Disorder & Management, 2011).

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A child with ADHD is likely to behave inappropriately regardless of the setting.

Psychosocial Interventions

Researchers recommend various behavioral interventions to help these children at home and in school (Pfiffner & DuPaul, 2015; Robin, 2015). In general, the programs set such goals as increasing the amount of time the child remains seated, the number of math papers completed, or appropriate play with peers. Reinforcement programs reward the child for improvements and, at times, punish misbehavior with loss of rewards. Other parent education programs teach families how to respond constructively to their child's behaviors and how to structure the child's day to help prevent difficulties (e.g., Loren et al., 2015). Social skills training for these children, which includes teaching them how to interact appropriately with their peers, also seems to be an important treatment component (Watson, Richels, Michalek, & Raymer, 2015). For adults with ADHD, cognitive-behavioral intervention to reduce distractibility and improve organizational skills appears quite helpful (Knouse, 2015). Most clinicians typically recommend a combination of approaches designed to individualize treatments for those with ADHD, targeting both short-term management issues (decreasing hyperactivity and impulsivity) and long-term concerns (preventing and reversing academic decline and improving social skills).

Biological Interventions

The first types of medication used for children with ADHD were stimulants. Since the use of stimulant medication for children with ADHD was first described (Bradley, 1937), hundreds of studies have documented the effectiveness of this kind of medication in reducing the core symptoms (hyperactivity, impulsiveness) of the disorder. It is estimated that 3.5% of the children living in the United States are being treated with medication for symptoms of ADHD (Zuvekas & Vitiello, 2012). Drugs such as methylphenidate (Ritalin, Adderall) and several nonstimulant medications such as atomoxetine (Strattera), guanfacine (Tenex), and clonidine have proved helpful in reducing the core symptoms of hyperactivity and impulsivity and in improving concentration on tasks (Connor, 2015).

Originally, it seemed paradoxical or contrary to expect that children would calm down after taking a stimulant. However, on the same low doses, children and adults with and without ADHD react in the same way. It appears that stimulant medications reinforce the brain's ability to focus attention during problem-solving tasks (Connor, 2006). Although the use of stimulant medications remains controversial, especially for children, most clinicians recommend them temporarily, in combination with psychosocial interventions, to help improve children's social and academic skills.