INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a childhood psychiatric disorder, estimated to affect 3 to 5% of school-aged children (American Psychiatric Association, 1994; Barkley, 1997). Children diagnosed with ADHD vary widely in the type and severity of symptoms that they demonstrate, but the disorder is generally characterized by developmentally inappropriate levels of inattention, impulsivity, and hyperactivity (American Psychiatric Association, 1987, 1994; Barkley, 1997; Cantwell, 1996). The diagnostic criteria for ADHD, specified in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV: American Psychiatric Association, 1994), divides symptoms into three domains of inattention, hyperactivity, and impulsivity. Inattention symptoms include difficulty concentrating and distractibility, impulsivity symptoms include acting without thinking and taking risks, and hyperactivity symptoms include being constantly “on the go” and excessive restlessness or fidgeting. The DSM-IV describes three subtypes of ADHD—predominantly inattentive type, predominantly hyperactive-impulsive type, and combined type, which describes children who exhibit features of all three symptom domains (American Psychiatric Association, 1994).
These diagnostic criteria result in a heterogeneous group of children being diagnosed with ADHD. Between 50 and 80% of these children also meet criteria for other psychiatric disorders or learning disabilities (Biederman et al., 1991; Cantwell, 1996; Tannock, 1998). Comorbid diagnoses commonly seen in children with ADHD include conduct disorder, oppositional defiant disorder, learning disabilities, affective disorders, and anxiety disorders. Social difficulties, low self-esteem, and aggression are also commonly associated problems (Barkley, 1997; Whalen, 1989; Wood, 1995).

The problem behaviours associated with ADHD usually appear early in a child’s development and are sustained over a long period of time, continuing into adolescence in 50 to 80% of cases and into adulthood in 30 to 50% of these cases (Barkley, 1997). Severe childhood ADHD can be associated with behavioural, social and academic problems that lead to difficulties coping with everyday life. Adolescents and adults with a history of ADHD are at greater risk for antisocial problems, alcohol and drug abuse, criminal behaviour, and academic and employment difficulties (Barkley, 1997; Castellanos, 1997; Fischer et al., 1990).

The most common treatment for ADHD is the prescription of the stimulant drugs methylphenidate (Ritalin) and dexamphetamine (Dexedrine). The efficacy of these drugs in alleviating the symptoms of ADHD in around 80% of cases has been well documented (Barkley, 1998; Campbell et al., 1989; Erickson, 1987; Jarman, 1996; Schachar, 1991; Solanto, 1998). They improve attention, concentration and self-control, while reducing impulsive behaviour, restlessness, motor overactivity and aggression (Barkley, 1995, 1998; Campbell et al., 1989; Jarman, 1996; Wood, 1995). Stimulants have a short half-life, producing therapeutic effects within 20 to 60 minutes after ingestion, which then dissipate within 3 to 7 hours (Dinklage & Barkley, 1992; Jarman, 1996). These drugs are thought to enhance the activity of dopamine and noradrenaline, principally by blocking their reuptake (Bradley, 1989; Cooper et al., 1986; Solanto, 1998). It is believed that these short-term effects on neurotransmitter systems are responsible for the improved attention, reduced motor activity and reduced impulsivity that is seen in children with ADHD treated with these drugs.

Non-pharmacological treatments for ADHD include behavioural and cognitive therapies such as positive reinforcement for appropriate behaviour, behaviour modification training, social-skills training, and special education programs (Cantwell, 1996; Dinklage & Barkley, 1992; Gelfand et al., 1988; Jarman, 1996; Levine, 1984; Wood, 1995). It is generally recognised that ADHD is best managed using a multiple-modality approach, combining psychosocial and pharmacological interventions (Cantwell, 1996; Dinklage & Barkley, 1992; Swanson et al., 1998b).

Despite extensive research, the underlying neurobiological mechanisms involved in ADHD are not well understood and its cause is not known (Barkley, 1998; Cantwell, 1996; Zametkin, 1995), although several theories to explain the disorder have been suggested. Brain damage, frontal lobe dysfunction, genetic factors,