THE ATTENTION-DEFICIT DISORDERS

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There are two basic types of attention-deficit disorders: ADD involves inattentiveness only and ADHD combines inattentiveness *and* hyperactivity. (Strictly speaking, there is a third diagnosis of 'hyperactive only' type which is reserved for children who are too young yet to be expected to pay attention, but it is seldom applied in practice.) Both terms are replacement labels for a condition that was first identified in 1902 as a lapse in 'volitional control' and which subsequently has variously been called minimal brain dysfunction, hyperkinesis and hyperactivity (Anastopoulos & Barkley 1992; Campbell et al. 2000). The criteria for diagnosis are listed in Box 15.4.

Box 15.4 Diagnostic criteria for ADD and ADHD

Attention problems. The child must display at least six of the following signs for a duration of at least 6 months to a degree that is maladaptive and inconsistent with the child's developmental level:

- failing to give close attention to details or making careless errors
- difficulty sustaining attention
- often appearing not to listen
- not following through with instructions or failing to finish tasks, not due to resistance or lack of understanding
- difficulty with organisation
- avoidance of tasks that require sustained mental effort
- losing things necessary for tasks or activities
- being easily distracted by extraneous stimuli
- forgetful in daily activities

Hyperactivity–impulsivity. A child must demonstrate at least six of the following symptoms:

- fidgeting with hands or feet, or squirming in seat
- being unable to sit during periods of time when remaining seated is expected
- for children: running about or climbing excessively in inappropriate situations; for adolescents or adults: restlessness
- difficulty playing quietly
- on the go constantly
- talks excessively
- blurts out answers to questions
- interrupts others
- difficulty waiting

To be diagnosed, symptoms must:

- have an onset prior to 7 years of age;
- continue for at least 6 months and for longer in preschool–aged children;
- be present in at least two situations;
- not be the result of other conditions.

Source: Goldstein 1995: 58–59.

NATURE OF THE ATTENTION-DEFICIT DISORDERS

Despite the longevity of the conditions, some writers (e.g. Jacobs 2005) claim that ADD and ADHD do not exist at all and that the labels are simply a form of oppression in which those with power (namely, parents, teachers and doctors) try to enforce child compliance and, when they cannot, will do so chemically. Jacobs is not alone in arguing that it is not children's noncompliance which is the problem, but society's intolerance of diversity (Conrad 2006).

However, most assert that these conditions are not behavioural, but instead represent a cluster of disabling and distressing learning impairments from which children deserve some relief (Karatekin 2004; Olson et al. 2002). Extensive research is concluding that the learning difficulties underpinning ADD or ADHD are deficits in the brain's executive functions. These processes control or regulate our thinking and problem solving, deficits in which produce inattention, lack of self-awareness, poor planning, judgment, organisational skills, reflection, and coordination abilities. Children with the conditions are less able to divide their attention between aspects of the task (Karatekin 2004) and take less time to plan ahead before initiating a response (Papadopoulos et al. 2005), perhaps because they cannot retain a long sequence of steps in their working memory and thus have to get started prematurely. They know what to do, but cannot do what they know – that is, they do not lack knowledge, but have difficulties performing or enacting what they know (Purvis & Tannock 1997). Their resulting inability to sustain a planful approach to tasks is manifested in impulsive behaviour.

These deficits in executive function lead to problems across many domains. The first is in verbal skills (Clark et al. 2002). In expression, children with ADD and ADHD have problems organising and monitoring their conversation, making it difficult for listeners to follow their train of thought; in comprehension, they have problems organising a sequence of ideas and checking their information recall (Purvis & Tannock 1997). In short, they are both misunderstood by listeners and misunderstand speakers (Clark et al. 2002).

To overcome the disorganisation of their thinking, these children talk out loud to themselves *more* than usual (Berk & Landau 1993; Berk & Potts 1991; Diaz & Berk 1995; Kopecky et al. 2005). This can lead to constant reminders to be quiet. When their hyperactivity is verbal rather than in motor skills, the children are insatiable: once they get an idea in their mind, they talk incessantly about it (Green & Chee 1994).

Attention difficulties (but *not* hyperactivity) also lead to reading impairments, because the children miss out on early instruction (Clark et al. 2002; Lonigan et al. 1999; McGee et al. 2002; Rabiner et al. 2000; Spira & Fischel 2005). Subsequently, their reading failure leads to progressive declines in attention skills and academic attainment (McGee et al. 2002; Spira & Fischel 2005).

Children with the attention deficits have difficulty regulating their emotions and actions in order to select a socially appropriate behaviour (Clark et al. 2002). They also lack self-awareness, having inflated evaluations of their social performance and thus not moderating their actions in response to others' negative feedback (Hoza et al. 2000). These social problems exceed those of children with pure behavioural difficulties alone (Clark et al. 2002). The children's attention deficits produce socially intrusive and disruptive behaviours that generate such significant social problems for them that these really should be included in the criteria for diagnosis (Hoza et al.

2000). The children's inappropriate social behaviour leads both to acrimony at home and difficulties with establishing friendships and, even more importantly, with sustaining friendships – except perhaps with other children who are experiencing similar difficulties (Barkley 1988).

This has an emotional cost. Children whose attention deficits give rise to social difficulties suffer associated emotional problems including low self-efficacy, depression and anxiety (Hinshaw 2006; Hoza et al. 2000; Shelton et al. 1998; Young et al. 2005). While these emotional difficulties may be *caused* by their problems with emotional self-regulation (Lengua 2003), they are almost certainly also a *result* of their social difficulties.

In terms of motor activity, unlike normally boisterous activity, ADHD activity levels are excessive, task irrelevant, developmentally inappropriate, and pervasive across settings (Anastopoulos & Barkley 1992). In short, children with ADHD fail to regulate their motor activity to suit the context. Their impulsiveness also results in a high rate of accidental injuries.

For unknown reasons, they experience a higher than usual rate of health problems such as incoordination, sleep disturbances, middle ear and upper respiratory infections, asthma, and allergies (Anastopoulos & Barkley 1992). Some of these health outcomes may be related to maternal smoking during pregnancy (Rodriguez & Bohlin 2005; Vuijk et al. 2006).

Finally, ADHD in particular often occurs in association with aggression and oppositional behaviour. These behavioural problems tend to increase over the early school years (Snyder et al. 2004) but, nevertheless are considered a byproduct rather than a defining feature of the attention deficits. Children with attentional difficulties but without hyperactivity tend not to develop aggression (Loeber & Hay 1997).

PREVALENCE

Australasian and U.S. research has found that around two per cent of preschool-aged children have ADHD (Lavigne et al. 1996; McGee et al. 1991), rising to three to five per cent during the school years once children's attention difficulties become apparent in the more structured school setting (Spira & Fischel 2005). As with most learning disabilities, more boys than girls are identified, with little variation across socioeconomic groups (Barkley 1988), although children from middle-class families may be rated more poorly by their teachers because of being compared to a more capable peer group (Lonigan et al. 1999).

There is widespread concern that ADHD in particular is over-diagnosed. This does happen, but under-diagnosis is also a concern, especially for girls who, among a mixed-sex group, may stand out less but can be quite disadvantaged compared to their same-sexed peers (L. Arnold 1996).

CAUSES

Inattentiveness appears to be due to difficulties controlling behaviours, while hyperactive-impulsive and antisocial behaviours could arise from impaired control of emotions which, in turn, results from coercive parenting within a stressed environment (Campbell 1995; Martel & Nigg 2006; Spira & Fischel 2005). Attention deficits are thought to result from immaturity in how the frontal parts of the brain function. This area of the brain is responsible for planning and impulse control. Early signs of attention difficulties and impairment in self-regulation appear well before

behavioural difficulties emerge (Olson et al. 2002), which indicates that there is a genuine neurodevelopmental impairment underlying the conditions. However, the exact cause of these impairments is uncertain. Genetics are clearly implicated (Auerbach et al. 2005; Groot et al. 2004; Hinshaw 2006; Stein et al. 2002), as is mothers' health during pregnancy (Anastopoulos & Barkley 1992; Barkley 1988). Two known risk factors are stress and, to a lesser extent, maternal smoking in the first half of pregnancy, when nicotine alters the fetus's serotonin production and brain cell growth (Monuteaux et al. 2006; Rodriguez & Bohlin 2005; Vuijk et al. 2006).

The constellation of difficulties experienced by children with ADD and ADHD generate family stress (Sheridan et al. 1997). Both parents and teachers are more negative in interacting with these children but become more positive with the children's behaviour improves, perhaps in response to medication (Whalen et al. 1981; Wodrich 1994). While this suggests that the conditions contribute to adults' negative disciplinary styles, the reverse is also true. Given the high genetic component of the conditions, many parents will themselves have elevated rates of symptoms and, perhaps, shorter fuses when parenting (Whalen et al. 2006). While having little impact on children's *attentional* difficulties, coercive discipline is likely to exacerbate their *behavioural* problems (Hinshaw 2006). Thus, while negative parenting does not cause the conditions, it can perpetuate and exacerbate its behavioural elements.

OUTCOMES

These conditions are likely to remain relatively stable through the school years into adolescence, with children with ADD experiencing ongoing academic (particularly literacy) difficulties and those with ADHD continuing to experience academic plus behavioural problems (Fischer et al. 1990; McGee et al. 1991, 2002; Spira & Fischel 2005). The symptoms do typically improve during the first year or two of school, after which inattentiveness remains stable, while hyperactivity and impulsive behaviours continue a slow decline (Hart et al. 1995). However, while it can appear that the children have outgrown the condition because their overt agitation improves, their inner restlessness often remains into adulthood.

Perhaps only one in four no longer displays ongoing problems into adolescence (Hart et al. 1995; McGee et al. 1991). Nevertheless, most adults make better adjustments to their workplace than they did to school (Barkley 1988). Those with the most favourable adjustment in adulthood have at least average intelligence and language skills, are able to develop and maintain friendships during childhood, are emotionally stable, are not aggressive, and have well-adjusted parents with low levels of family stress (Barkley 1988; Fischer et al. 1993; Goldstein 1995; Greene et al. 1997; Hart et al. 1995; Shaw et al. 2005; Spira & Fischel 2005). The severity of inattentive symptoms appears *not* to make affected children any more prone to behavioural problems in adolescence, unless they were aggressive and oppositional in childhood (Broidy et al. 2003; Nagin & Tremblay 1999) and experience socioeconomic disadvantage (McGee et al. 2002).

ASSESSMENT

Most children show their first signs of the conditions at between three and four years of age. Nevertheless, ADD tends not to be identified until school age, in response to the children's difficulties with sustaining attention. By the school years, ADD is more

prevalent than ADHD but is referred to specialists less often because, while debilitating in terms of learning, it is less disruptive (Hinshaw 2006).

Behavioural observations

Despite the fact that the conditions are intellectual, children's behaviours as listed in Box 15.4 will be the first signal of underlying cognitive impairments. These behaviours are most noticeable when the children are tired; expected to concentrate for long periods; and are in a group rather than one-to-one situations; when the activity is boring or repetitive; and when movement is restricted (Anastopoulos & Barkley 1992). Affected children have most trouble when having to plan and monitor their behaviour independently, compared with having an adult supervise them (Clark et al. 2002).

However, the diagnostic criteria are vague, qualified by the word 'often' (e.g. '*often* fidgets'), with no objective criteria to determine how much *is* 'often' (Jacobs 2005). In the early childhood years in particular, it is difficult to distinguish normal childhood exuberance from ADHD, making accurate diagnosis difficult. Diagnosis on the basis of observations is also complicated by the fact that the children's behaviour varies according to the circumstances. This requires that symptoms be displayed in two different locations, one of which should not be a clinic setting, as children seldom misbehave in clinicians' offices (Barkley 1988; Hinshaw 2006).

Developmental assessments

Given that ADD and ADHD are intellectual impairments, children's attention, intellectual and language skills must be assessed, comparing these findings to observations by the practitioner (psychologist or speech pathologist, for example), caregivers or teachers and parents to determine whether there is a significant discrepancy between the children's measured intellectual abilities and their ability to apply their intelligence in their daily lives (Shelton et al. 1998). Other potential developmental problems must also be excluded (American Psychiatric Association 1994). The precise nature of children's attention deficits will need to be established, as these could encompass problems with *focus*; maintaining attention over time (that is, concentration or *attention span*); *selective* attention (that is, ignoring distractions); or *dividing* their attention between tasks in order to manage more than one activity at a time (Sternberg 1999).

Medical assessments

One of the main barriers to children being diagnosed with ADD and ADHD is that their parents seldom request medical assessments (Sayal et al. 2006). Such assessments will be useful to gain an understanding of any associated health conditions and to exclude other potential health problems that could account for the children's behaviours and developmental skills (Anastopoulos & Barkley 1992).

TREATMENT

Given the above litany of cognitive deficits and their impacts on children academically and socially, it remains to be asked how an educational problem comes to be defined as a medical one. Conrad (2006) reports that children are typically referred to doctors for diagnosis of ADHD when their parents and teachers have 'tried everything' but have failed to contain the children's inattentiveness,

impulsivity or hyperactive behaviour. However, 'everything' typically means every behaviourist sanction they know of (such as time out, lectures by the principal, case conferences with parents), when instead interventions for an educational problem *need to be educational.*

Educational interventions

Surprisingly little research has been conducted on how best to remediate the learning difficulties of children with ADD and ADHD (Raggi & Chronis 2006). However, the teaching environment, content and processes can all be modified.

Environment. Children with attention deficits will be more productive in settings that are well organised, with clear procedures and predictable schedules. In classrooms, it can also be useful to seat children with ADHD in the least distracting location in the room (Lewis & Doorlag 2003).

Content modifications. Children will need intensive instruction in problem solving (Purdie et al. 2002) and self-restraint skills, such as using an inside voice, settling to activities, and taking turns (Merrell & Wolfe 1998; Rogers 2003), as well as remediation of their associated learning difficulties (e.g. language or reading impairments). At the same time, however, the children need ample opportunities to demonstrate their strengths to counteract this focus on their difficulties (Lewis & Doorlag 2003).

Process adjustments. Teaching and learning processes will need to be modified so that the children's attentional problems do not impede their ability to profit from instruction. They will need to be actively engaged in learning in contrast to passive listening, receive simplified instructions in short bursts, be allocated extra time to complete tasks, and given assistance to structure activities and manage transitions. Fidget items can help them concentrate while sitting still.

Social and emotional interventions

The subgroup of children who display both ADHD *and* aggression have pervasive social difficulties, suffering impaired relationships with peers and family. Although their number of prosocial interactions is the same as for children without ADHD, their impaired social judgment leads to a ten-fold increase in physical aggression and a three-fold increase in verbal aggression (Goldstein 1995). Their low self-control is also associated with elevated levels of both victimisation and bullying by others and, in turn, peer rejection (Hay et al. 2004; Snyder et al. 2004). If their aggression does not remit, their peer rejection becomes entrenched over time (Stormshak et al. 1999), while being rejected makes it more likely that they will remain aggressive (Snyder et al. 2004). Therefore, social interventions will need to focus on teaching self-monitoring and emotional self-control (particularly anger management), and adjusting dysfunctional thinking (Hinshaw 2006; Miranda & Presentación 2000). See chapters 5 and 14 for ways to encourage prosocial skills.

Behavioural guidance

Educational adjustments are intended to make it *easier* for affected children to engage with learning; disciplinary methods must help them be more *willing* to do so by enhancing the children's relationships with adults. Despite the fact that these

children's lack of self-control seems to imply that they *need* someone else to take charge of them through the delivery of rewards and punishments (such as star charts, time out, and withdrawal of privileges), one study found that an extensive behaviourist treatment produced some improvements in children's functioning in the classroom, but no measurable improvement at home or on any test of academic skills (Barkley et al. 2000). In contrast, parents' use of a guidance approach improves the children's social skilfulness and reduces their antisocial and defiant behaviour (Hinshaw 2006). Even if controlling methods could teach these children to do as they are told, they most need to learn to take charge of their own behaviour, which cannot happen if adults manage their behaviour for them. Therefore, I recommend the guidance methods described in chapters 9 to 12 for teaching affected children how to regulate their own behaviour.

Dietary management

The research evidence for dietary restrictions is still scant, perhaps because all children were advised to eliminate the same food groups, when instead individuals can be sensitive to particular foods. (The foods most suspect were listed in chapter 13 in the section on *Fussy eating*.) Food intolerances are more likely in children who have severe symptoms of the condition and who have family members with allergic conditions such as eczema, asthma or migraines (Goldstein 1995). Elimination diets have been recommended, particularly to improve the emotional aspects of ADD and ADHD (Dengate 1997, 2004). However, these turn parents into helicopters, having to hover over their children to monitor what they eat. More successful in my clinical experience is bioresonance, which uses a computer to detect and then treat individuals' food intolerances and viral overloads (see the web address below).

Another potential dietary trigger is high insulin production. This causes affected children's blood sugar levels to drop too low. In response, blood (containing the fuel, sugar) is directed away from non-essential areas of the brain: namely, the pre-frontal lobes (Blum & Mercugliano 1997). The symptoms of ADD/ADHD then surface. This potential cause is particularly relevant for children aged under ten, as their brains use twice as much glucose as adults' (Glaser 2000). Low blood glucose levels are most likely in children who have a family member with diabetes, who crave carbohydrates, or whose symptoms appear around two hours after the last meal. Blood tests for glucose tolerance and serum insulin levels can flag hyperinsulinemia as a potential cause. Treatment can involve a low-carbohydrate diet, or a diet in which every meal contains at least half protein and not more than half carbohydrates. Naturally, medical advice would be essential before parents were to implement any dietary restrictions for their children. Although medical evidence is still accumulating, many practitioners consider that at least some children who have been diagnosed with ADHD can benefit from dietary modifications, and that these children would suffer unnecessarily if we withheld dietary management while awaiting unequivocal evidence.

Support parents

As a result of their children's demanding behaviours and their own reduced self-confidence, parents of children with ADHD often feel stressed and as a consequence may discipline their children in ways that appear to be exacerbating their behavioural difficulties. Alternatively, some parents report that their child has ADHD-like behaviour at home but you see none of it in your setting. This, however, is not

evidence that the parents are incompetent or exaggerating: children's behaviour does fluctuate across settings. Also, many children behave less well for their parents in the confidence that their parents will love them anyway.

Therefore, resist the temptation to doubt parents. Exchange information with them about what works and doesn't work for each of you; if they want more information and like to read, suggest some books that might give them some additional disciplinary strategies. Ask their permission to speak directly to their child's medical and developmental specialists, so that you are better equipped to understand their child's condition and treatment regime.

Medication

For children aged over five years and those with moderate to severe symptoms, medication still appears to have more benefits than any other form of treatment, although it produces no permanent improvements (Anastopoulos & Barkley 1992; Barkley 1988; Fox & Rieder 1993; Goldstein 1995; Hinshaw 2006; Purdie et al. 2002). While around 75 per cent of those who are accurately diagnosed respond to an amphetamine, the debate continues about which children benefit most from medication, and at which doses (Levy 1993). Almost 40 per cent experience significant side-effects spanning fatigue, confusion, insomnia, appetite suppression (resulting in slowed growth), nausea, headaches, tremors and tics (Goldstein & Goldstein 1995; Levy 1993; Moline & Frankenberger 2001; Purdie et al. 2002), particularly at higher doses (Fox & Rieder 1993).

Sustained-release methylphenidate (whose brand name is *Concerta*) is designed to avoid many of these side-effects and, being a once-daily dose, also averts both the detrimental effects of missed doses and the social stigma of having to take medication. However, its therapeutic effects are more variable (Stein et al. 2002).

There is some preliminary evidence that children's inattentiveness responds better to medication than do their hyperactive symptoms (Kopecky et al. 2005), while the secondary problems such as aggression seem even less amenable to medication (Hinshaw 2006). Moreover, while medication may improve some symptoms and young people report that it helps them to get along with their peers and parents, it does not completely ameliorate their restlessness, impatience, talkativeness or inattention, or improve their educational outcomes (Moline & Frankenberger 2001; Purdie et al. 2002; Whalen et al. 2006). This means that educational interventions remain necessary, with or without accompanying medication.

Despite their effectiveness in proscribed cases, drugs should never be the first treatment option. On the other hand, the impact of severe ADHD on affected children and their families sometimes justifies the administration of drugs. The decision to use medication, then, will depend on:

- the severity of the condition;
- whether other methods have been tried and have failed;
- the child's age;
- the child's and family's attitude to medication; and
- the ability of parents and caregivers or teachers to supervise a medication regime adequately (Goldstein & Goldstein 1995).

Medication does not have to continue indefinitely: sometimes, children and their

families benefit from giving themselves a few weeks' respite from the symptoms, during which time they can muster their resources to practise other forms of management.

FURTHER READING

Green, C. & Chee, K. (1997). *Understanding ADHD: A parent's guide to attention-deficit hyperactivity disorder in children.* Sydney: Random House.

Bioresonance websites

www.biocom-bioresonanz.de

www.bioresonance.net.au