



# Managing ADHD

## Getting the balance right

### Key points

- A careful and comprehensive assessment is needed to develop an effective treatment plan for a patient with ADHD. Multiple informants should be involved.
- Behavioural symptoms must always be evaluated, with consideration of the developmental stage of the young person.
- Key comorbid conditions have to be identified and specific treatments applied for them.
- Psychosocial interventions and medications for ADHD always need to be tailored for an individual patient to maximise benefits and minimise adverse effects.
- GPs have a central role in monitoring an approved treatment plan and liaising with the paediatrician and/or child and adolescent psychiatrist.
- Careful ongoing patient monitoring across the developmental stages is required to get the balance of medication and psychosocial/educational interventions right.

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Attention deficit hyperactivity disorder (ADHD) is common and usually presents with other comorbid psychiatric disorders that need to be recognised and treated. Careful ongoing patient monitoring across developmental stages is needed to get the balance of medication and psychosocial/educational interventions right.

**A**ttention deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental conditions affecting children and adolescents. It has the core symptom dimensions of inattentiveness, motor overactivity and impulsiveness, with three subtypes being recognised. The inattentive subtype (inattention dimension alone) has the highest point prevalence in epidemiological samples, whereas the combined subtype (all three core symptom dimensions) predominates in clinically referred samples.<sup>1</sup> The other subtype (hyperactive-impulsive dimension) tends to be indistinguishable from the combined subtype.

ADHD is a major driver for patient referral to educational, health and welfare services because of its significant associated functional impairments in the home, school classroom and playground environments. Young people with

ADHD struggle to learn from their parents and siblings at home, to progress academically in large classroom groups, and to develop nuanced social skills within their peer group.<sup>2</sup> As childhood gives way to adolescence and ever more is expected of young people (academically, socially and within the family), ADHD-related deficits often become increasingly apparent. Although the symptoms (especially hyperactivity and impulsiveness) improve over time, unfortunately only a minority of sufferers experience improved quality of life and functionality without medication and/or psychosocial interventions as they grow into adults. Indeed, the effects of ADHD in adults (mainly the inattentive and impulsive symptom dimensions) have recently begun to be systematically examined, with educational, occupational and relationship underachievement clearly evident.<sup>3</sup> Consequently, ongoing targeted treatment has been emphasised.

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Figure. Speech therapy can be helpful for patients who have ADHD and speech and language developmental delay.

## COMORBID DISORDERS ARE THE RULE

One of the most troubling clinical aspects of ADHD is the fact that it usually presents with other psychiatric disorders rather than as a single disorder.<sup>4</sup> For optimal outcomes to be achieved, both ADHD and the comorbid conditions need to be recognised and treated.

It is particularly important to recognise the comorbid conditions that respond well to specific interventions and, if left untreated, contribute to poorer response to ADHD treatment. Interventions include motor learning programs (for clumsiness), speech therapy (for speech and language developmental delay and pragmatic difficulties) and educational remediation and tutoring (for learning disorders, especially in reading, spelling and maths). Further, the effects of learning disorders may lead to symptoms presumed to be ADHD; this can be identified through careful and systematic assessment of the child's developmentally appropriate abilities and impairments in school and home domains.

Oppositional defiant disorder and the more severe (but much less common)

conduct disorder are the comorbid conditions that are most frequently encountered in patients with ADHD. These are easily recognised in the clinical setting and significantly enhance the risk of educational, social and future occupational underachievement. Fortunately, they respond to well-delivered psychosocial interventions, such as training for parents in behaviour management techniques, school-based training for teachers in management strategies for the classroom and playground, and training for the child in social skills. If possible, these interventions are best delivered together as a package. Oppositional symptoms may also respond to stimulant medication, although a higher dose is generally needed than that used to treat ADHD in the absence of oppositional symptoms.

Comorbid anxiety and depressive disorders can be harder to recognise in the setting of ADHD but they do respond to psychosocial interventions and/or medication. Separation anxiety disorder, social phobia and generalised anxiety disorder are frequently linked to school refusal behaviour in young people with ADHD. Dysthymic disorder can then develop and

worsen school refusal behaviour and increase the risk of a major depressive episode, especially in adolescence and adulthood. Targeted management of anxiety, mood regulation and social skills training programs can be of significant benefit. Fluoxetine, fluvoxamine and sertraline (the three selective serotonin reuptake inhibitors approved for use in patients under the age of 18 years) can be used to treat moderate or severe anxiety and depressive disorders.

It is important to note that ADHD-linked poor planning and organisational abilities occurring in combination with increased impulsiveness and worsening anxiety or depressive symptoms can enhance the risk of suicidal ideation and attempts at suicide. Symptoms of self-harm need to be planned for, recognised and monitored carefully in adolescents and adults with ADHD and anxiety and depressive disorders.

## RISK FACTORS

Aetiological risk factor research is increasingly being influenced by epigenetic principles emphasising common and combined effects of biological and environmental factors on the onset, progression and treatment response of young people with ADHD.<sup>5</sup> These principles suggest that the developing brains and minds of young people are influenced by both biological factors and psychosocial/environmental factors. Therefore, both sets of factors need to be understood in each clinical case and be the focus of targeted medication and psychosocial treatment.<sup>6</sup>

To date, biological risk factor research supports the following:

- ADHD is associated with mainly white matter-altered development
- prefrontal cortex connections with the basal ganglia, temporal and parietal lobes can be affected in patients with ADHD, with more diffuse and immature neural network formation as a result
- cognitive capacitance may be diminished in patients with ADHD, with

reduced planning, organising and monitoring abilities and decreased inhibitory abilities affecting behavioural, emotional and cognitive regulation

- ADHD is highly heritable, although a particular candidate gene may not contribute much to the development of ADHD on its own because there are many potential aetiological pathways into the condition.

Future research into biological risk factors for ADHD will be enhanced by methodologies that allow the spatial resolution abilities of MRI to be integrated with the temporal resolution abilities of brain electrical activity mapping.

Psychosocial risk factor research is not yet able to identify particular factors in the parent-child relationship, family unit, parental relationship or parental psychopathology that are associated with ADHD separate from its common comorbid conditions. However, role definition problems and behavioural control difficulties within the family unit, as well as coercive, poorly empathic and attuned parent-child relationships and parental psychopathology remain risk factors for the development of ADHD and its comorbid conditions.

## MANAGEMENT

Treatment for ADHD usually follows on from the comprehensive specialist clinical assessment that identifies ADHD and its comorbid disorders. Assessment includes a careful history, physical examination and, if indicated, specialist investigations. The history is provided by multiple informants – parents, the child, teachers and other responsible adults, siblings and peers (with parental permission). Information from the young person him/herself, is especially important and helps to ensure compliance with treatment. Management should involve specific psychosocial interventions and educational strategies, facilitated by medication that maximises the patient's ability to engage in and learn from these.

## ADHD IN CHILDREN AND ADOLESCENTS: THE ROLE OF THE GP

GPs are central to the early identification, initial assessment and management of patients with ADHD (with or without comorbid conditions), as well as referral to paediatricians and/or psychiatrists. Together with their specialist colleagues, GPs have a role in evaluating the potential benefits of medication and psychosocial treatments and in recognising and treating possible adverse effects of these interventions. They are also involved in parent management training and may undertake patient social skills training. Further, GPs oversee the referral of ADHD patients to allied health professionals (e.g. psychologists, occupational therapists, speech therapists and nurse practitioners) to manage comorbidities and they liaise with teachers and school support staff to optimise the academic and social learning outcomes of these patients with ADHD.

At present, the community in general, health professionals and educators have widely varying knowledge about risk factors for ADHD and its holistic management. At times, simplistic and sensationalist discussion in the media can confuse and indeed alarm patients and their families. In this situation, the GP must allay fears and concerns by conveying accurate knowledge of the condition and the medications used to treat it (effectiveness and safety), based on international consensus views and objective research. This can be a difficult undertaking, given that GPs alone rarely prescribe stimulant medication and atomoxetine for children and adolescents with ADHD. The international guidelines are the most helpful sources for information that is current and accurate – some of these are available online, for example:

- *ADHD: Clinical Practice Guideline for the Diagnosis, Evaluation, and Treatment of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents*, at <http://pediatrics.aapublications.org/content/early/2011/10/14/peds.2011-2654> (reference 3)
- *Clinical Practice Points on the Diagnosis, Assessment and Management of Attention Deficit Hyperactivity Disorder in Children and Adolescents*, at <http://www.nhmrc.gov.au/guidelines/publications/mh26> (reference 6).
- *Canadian ADHD Practice Guidelines*, at <http://www.caddra.ca/cms4/pdfs/caddraGuidelines2011.pdf> (reference 8).

The role of the GP in managing patients with ADHD is outlined in the box on this page.

### Psychosocial interventions

At present, psychosocial interventions are mainly helpful for the comorbid conditions associated with ADHD rather than for the core symptom dimensions of ADHD itself.<sup>3,6-8</sup> Appropriate psychosocial interventions include positive reinforcement of desired behaviour (such as token systems), response-cost procedures for undesired behaviour and, for older children and adolescents, contingency contracts. Techniques for self-management of stress, anxiety and mood regulation are helpful, as is training in social skills.

### Stimulant medication

The primary effective treatment for ADHD is stimulant medication, in both short-acting and long-acting forms. It is effective across all developmental stages. The therapeutic effects of stimulant medication include:

- decreased ADHD symptoms
- improved cognitive deficits (e.g. attention, memory, working memory and response inhibition)
- reduced academic and social impairments due to ADHD
- improved quality of life for patients and their families, and
- increased compliance and learning from psychosocial interventions.<sup>3,9</sup>

The key actions of stimulant medication, which are thought to be associated with its



therapeutic effects, include increasing the functional activity of dopamine and nor-adrenaline through inhibition of their presynaptic reuptake. These actions appear to facilitate compensatory brain neural networks that subserve more situation-appropriate cognitions, emotions and behaviour in the child with ADHD.<sup>10</sup> The effects are dose-dependent for hyperactivity and impulsiveness; however, in a subgroup of children, attention and working memory improve at low doses but can become impaired at high doses.<sup>11</sup>

There are two stimulant medications available in short-acting form: dexamphetamine and methylphenidate. These medications do not differ in effectiveness or adverse effects, although individual patients may appear to respond better to one compared with the other. The clinical effect of short-acting stimulant medication is evident for three to four hours on average, necessitating dosing two to three times daily.

Methylphenidate is also available in long-acting form. This has the primary

advantages of once-daily dosing, with clinical effectiveness lasting through morning and afternoon, which removes the perceived stigma of medication use while at school.

The key adverse effects of stimulant medication are all dose-dependent and can be managed through subtle dose reduction. Appetite suppression and initial insomnia are the most common adverse effects, along with nervousness and dysphoria early in treatment. Motor and/or vocal tics and growth retardation (of small effect) can emerge. Rarer adverse effects include nausea, vomiting, rash, headache, dizziness, significant weight loss and irritability.

Paediatricians and psychiatrists are approved prescribers of stimulant medication in all Australian states and territories and should initiate and optimise the dosage in children with ADHD. GPs may be approved to provide maintenance doses when working with a paediatrician and/or child psychiatrist. In the early phase of treatment, monitoring should include daily phone consultations with the primary

caregiver for the first five days and weekly face-to-face consultations so that therapeutic and adverse effects can be assessed. Dosing is usually optimised after one to two weeks, and weekly or monthly face-to-face monitoring is recommended thereafter.

Stimulant medication can be used on a day-to-day basis with none used on weekends. This is an option that some families prefer. Each child should be thoroughly reassessed every six months and the requirement for stimulant medication (short- or long-acting form) re-evaluated.

If stimulant medication is to be ceased, it should be decreased by one tablet (e.g. 10 mg per day for methylphenidate and 5 mg per day for dexamphetamine) until finished. Patients taking long-acting medication should be switched to an equivalent short-acting form, with this being decreased gradually, as described above, until finished. Occasionally, stimulant medication will need to be continued into adult life.

The abuse potential of stimulant

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medication has been repeatedly noted in the media. Interestingly, the pharmacodynamic and pharmacokinetic properties of stimulant medication and metamphetamine (the illegal form of amphetamine) differ to the extent that stimulant medication has a much lower abuse potential when used in therapeutic doses.

**Atomoxetine**

When stimulant medication is ineffective, leads to adverse effects (e.g. emotional disturbance or worsening of tics) or is not a treatment that a patient will use, alternative options can be considered. Atomoxetine is the current second-line treatment for ADHD. It is a potent reuptake inhibitor of noradrenaline at the presynaptic terminal and is of some benefit in the short term for children with ADHD.

Atomoxetine has a longer duration of action than stimulant medication and can be helpful during the evening and night as well as during the day. It has a similar benefit and adverse effects profile to stimulant medication and a significantly lower abuse potential.

**Other medications**

There are several other medications, such as clonidine and risperidone, that are noted in Australian<sup>6</sup> and international<sup>3,7-9</sup> clinical practice guidelines for ADHD. These guidelines all affirm a holistic approach to ADHD management that integrates medication and psychosocial/educational interventions to maximise the development of the patient with ADHD.

**Dietary measures**

At present, there is insufficient evidence to support the use of targeted dietary adjustments and/or free fatty acid supplementation (e.g. fish oils) as first-line treatments for patients with ADHD.

**CONCLUSION**

An effective treatment plan for a young person with ADHD involves careful and comprehensive assessment and is dependent on information from a number of

informants, especially the young person. Key comorbid conditions need to be identified and require specific treatment. A management approach for ADHD always needs to be tailored to an individual patient to maximise benefits and minimise adverse effects, and careful ongoing monitoring is needed to ensure necessary adjustments are made as the child develops through adolescence into adulthood. The GP has a central role in monitoring an approved treatment plan and liaising with the paediatrician and/or child and adolescent psychiatrist. **MT**

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