



Improving recognition and management of ADHD

Forbes, F. Improving recognition and management of ADHD.
Practitioner 2010; 254 (1728):34-38

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How should
ADHD be
diagnosed?

What are the
evidence-based
treatment options?

What other
disorders are
associated with
ADHD?



**ATTENTION DEFICIT
HYPERACTIVITY
DISORDER (ADHD) IS NOT
A NEW DISORDER. THERE**

are clinical descriptions of children with attention disorders dating back to the late 18th century.¹

ADHD is the term most widely used to cover a group of common, chronic neurodevelopmental disorders characterised by developmentally abnormal and disabling levels of restlessness and overactivity (usually combined with impulsiveness) and/or inattention (see table 1, p35).

ADHD is multifactorial in origin, with a strong genetic component and is four times more common in boys than girls.

For a diagnosis of ADHD to be made:

- onset of symptoms has to occur before the age of seven
- symptoms should have been present > 6 months
- the symptoms must cause significant impairment

The prevalence of ADHD is at least 5% and that of the most severe form i.e. hyperkinetic disorder (HKD) 1-2%. However, a survey of services for ADHD in Scotland found that only 0.6% of children and adolescents were receiving treatment.²

Two-thirds of children with ADHD continue to have symptoms in adolescence. At the age of 25, half will still have symptoms which continue to cause significant impairment.³

ADHD impacts on many areas of a child's life and can lead to secondary problems such as low self-esteem, poor peer relationships, academic and occupational difficulties and strained family relationships. In addition, ADHD is associated with an increased rate of other disorders (see table 2, p35).⁴

NATIONAL GUIDELINES

SIGN first published a clinical guideline on the management of ADHD in children and adolescents (SIGN 52) in 2001. This guideline has now been superseded by SIGN 112, published in October 2009, which contains updated information on treatment and interventions. Studies were included where improvement in core ADHD symptoms was the primary outcome.⁴ NICE published a comprehensive guideline on ADHD in 2008 covering all age groups.⁵ NICE evidence tables were examined and updated for this guideline as appropriate. The SIGN guideline also includes an information leaflet for parents and carers.

THE GP'S ROLE

The GP has an important role in identification of possible ADHD, and onward referral, and also in the management of ADHD post-diagnosis.

It is likely that the GP's main role in the treatment of ADHD will be in the prescribing of medication, usually on a shared care basis with specialist services.

A very small number of GPs are conducting ADHD/HKD medication review clinics of children well stabilised on medication, while maintaining links with specialist services.

GPs also need to be aware of other problems and disorders which may be associated with ADHD (see table 2, p35).

Concerns about the child's behaviour may have been raised by the parents or the school. The child may have been underperforming academically and there may also be problems with peer relationships. A child with ADHD is often described as being 'in your face', 'constantly on the go' or 'hopeless following instructions'. A child with predominantly inattention problems is often described as a daydreamer.

It is important to ask about the core symptoms of ADHD, the age of onset and duration, and to consider the

Table 1**Subtypes of ADHD**

DSM-IV identifies three subtypes of ADHD:

- predominantly inattentive
- predominantly hyperactive-impulsive
- combined type (inattention and hyperactivity/impulsiveness)

ICD-10 describes hyperkinetic disorder (HKD) which equates best with the combined type of ADHD. Symptoms are pervasive with onset before the age of six

possibility of comorbidity. A report from the school is helpful. When enquiring about family history, it is useful to ask parents about their own experiences at school and whether they had difficulties with concentration, behaviour or academic work, for example, did they receive additional learning support? If there is a strong suspicion of ADHD, a referral should be made to the local child and adolescent mental health service (CAMHS) or a paediatrician with a special interest in ADHD.

SPECIALIST ASSESSMENT

This should involve a clinical interview with the child and parents covering presenting difficulties and interventions to date, prenatal and developmental history, family history and family functioning. In addition, older children may have an individual assessment.

Clinical examination of children and young people should include a systems inquiry, details of previous health problems, current drug treatment, and physical examination. Vision and hearing should be assessed and formally tested if indicated.

Parental consent should be sought to obtain information from the child's school regarding presentation as well as attainment level and the child's level of achievement relative to age and ability.

Questionnaires/rating scales, completed by parents and school (and adolescent patients) can be helpful. There is no laboratory or psychological diagnostic test. Observation of the child at school, in both a structured and unstructured setting, can be helpful, particularly in complex cases but is time consuming.

A diagnostic formulation should then be made, including the presence of secondary problems and comorbid disorders (which may require further assessment and treatment).

A management plan needs to be agreed with the family. This should include the provision of information on ADHD and parental consent to involve the school in further management.

ADHD can impact on many areas of a

child's life. Therefore a comprehensive package of care is required. SIGN continues to underline the importance of a multi-agency approach to ADHD management, involving both health and education services. The multidisciplinary guideline development group (GDG), in updating the treatment section, reviewed evidence for the effectiveness of a range of interventions, including psychological, pharmacological and alternative treatments.

Figure 1 summarises the main recommendations on specific treatment approaches (see p36).

INTERVENTIONS FOR ADHD**Psychological interventions**

The GDG found a relative lack of randomised trials of psychological and other non-pharmacological interventions for core ADHD symptoms. No good quality studies were identified in adolescents.

Parents: The most commonly evaluated psychological intervention is behavioural training for parents. This is a treatment method which teaches parents how to apply child management strategies, improve their parenting skills and help them deal with specific problem behaviours. It also includes encouraging parents to identify and reinforce appropriate behaviours and helping parents engage in play and child-centred activities.

SIGN recommends behavioural training as first-line management for parents of preschool children with symptoms of ADHD. This should be provided by trained facilitators.

Parenting training programmes are recommended for parents of school children with ADHD as first-line management where symptoms are mild. In more severe cases, training is recommended for the treatment of the associated behavioural and/or anxiety disorders which commonly coexist with ADHD.

Child: Individual cognitive, self-regulatory training (particularly targeting impulsive behaviours) has not been shown to be very successful in children. Psychosocial

Table 2**Other disorders associated with ADHD**

- mood disorders
- anxiety
- other behavioural disorders (e.g. conduct disorder, oppositional defiant disorder)
- autism spectrum disorders
- tic disorders
- specific learning difficulties
- developmental co-ordination disorder
- sleep disorders in up to 50% of cases

treatment approaches with the child are best reserved for associated problems such as anxiety, low self-esteem and difficulties with peer relationships.

School: Individualised school intervention programmes including behavioural and educational interventions are also recommended for children with ADHD.

Pharmacological treatments

Medication is recommended as first-line treatment for core symptoms of severe ADHD (i.e. HKD) and for milder forms when simple behavioural interventions alone have been unsuccessful.

The use of medication, and in particular stimulants such as methylphenidate, has sparked controversy in the lay media. And yet these are relatively safe drugs, which have been used for decades, and have been shown in numerous studies to be effective in treating the core symptoms of ADHD, at least in the short- to medium-term (24 months).

There are three licensed medicines in the UK for the treatment of ADHD: the psychostimulants methylphenidate hydrochloride and dexamfetamine sulphate and the non-psychostimulant atomoxetine. Methylphenidate and atomoxetine are licensed for use in children aged six years and above, whereas dexamfetamine is licensed for use in children aged three years and above. Medication is not recommended as first-line therapy for children of preschool age.

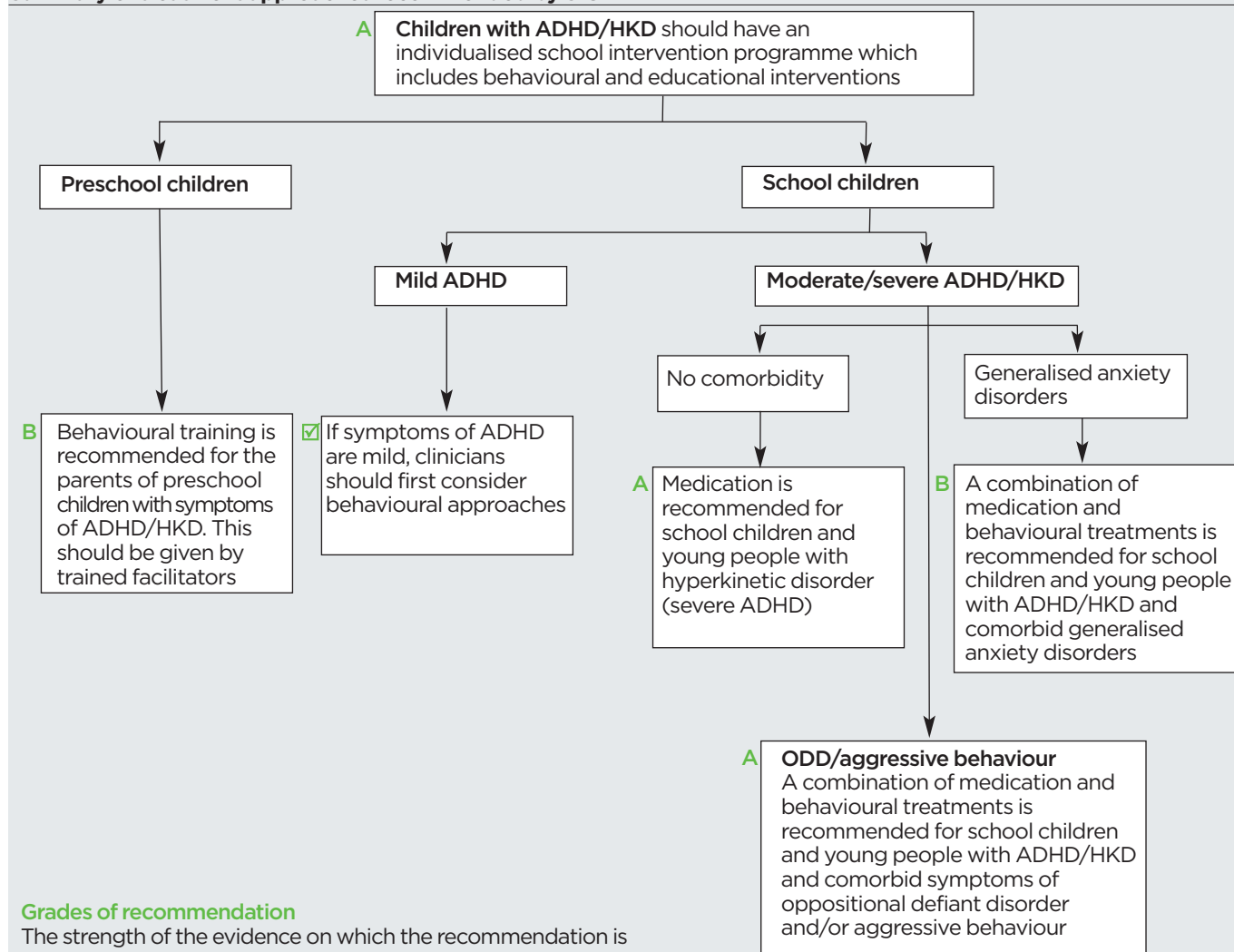
The continuing benefit from, and need for, medication should be assessed at least once per year.

Psychostimulants

SIGN recommends psychostimulants as first choice medication for core symptoms of ADHD. In the UK, in practice this is usually methylphenidate. If there is no response to methylphenidate or poor >>

Figure 1

Summary of treatment approaches recommended by SIGN



Grades of recommendation

The strength of the evidence on which the recommendation is based.

A At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 1++ or 1+

C A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++

D Evidence level 3 or 4; or extrapolated evidence from studies rated as 2+

Good practice points

✓ Recommended best practice based on the clinical experience of the guideline development group

Levels of evidence

1++ High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias

1+ Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias

1- Meta-analyses, systematic reviews, or RCTs with a high risk of bias

2++ High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 Non-analytic studies, e.g. case reports, case series

4 Expert opinion

Adapted from SIGN 112. Management of attention deficit and hyperkinetic disorders in children and young people

key points

SELECTED BY

Dr Peter Saul

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ADHD is the term most widely used to cover a group of common, chronic neurodevelopmental disorders characterised by developmentally abnormal and disabling levels of restlessness and overactivity (usually combined with impulsiveness) and/or inattention. There are three subtypes of ADHD: predominantly inattentive; predominantly hyperactive-impulsive; and combined type. For a diagnosis of ADHD to be made: onset of symptoms has to occur before the age of seven, symptoms should have been present longer than 6 months and they must be causing significant impairment.

The prevalence of ADHD is at least 5%. Two-thirds of children with ADHD continue to have symptoms in adolescence. At the age of 25, half will still have symptoms which continue to cause significant impairment. ADHD is associated with an increased rate of other disorders: mood disorders; anxiety; other behavioural disorders; autism spectrum disorders; tic disorders; specific learning difficulties; developmental co-ordination disorder and sleep disorders.

The GP has an important role in identification of possible ADHD, and onward referral, and also in the management of ADHD post-diagnosis, particularly with respect to prescribing medication usually on a shared care basis with specialist services. It is important to ask about the core symptoms of ADHD, the age of onset and duration, and to consider the possibility of comorbidity. A report from the school is helpful. If there is a strong suspicion of ADHD, a referral should be made to the local CAMHS or paediatrician with a special interest in ADHD.

SIGN recommends behavioural training as first-line management for parents of preschool children with symptoms of ADHD, provided by trained facilitators. Medication is recommended as first-line treatment for core symptoms of severe ADHD and for milder forms when behavioural interventions have been unsuccessful.

There are three licensed medicines in the UK for the treatment of ADHD: the psychostimulants methylphenidate hydrochloride and dexamfetamine sulphate and the non-psychostimulant, atomoxetine. Methylphenidate and atomoxetine are licensed for use in children aged six years and above; dexamfetamine for children aged three years and above. Medication is not recommended as first-line therapy for preschool children.

Psychostimulants are recommended as the first choice medication for core symptoms of ADHD. In the UK, in practice this is usually methylphenidate. Response to methylphenidate is assessed by means of a trial period, during which there should be close liaison with parents and with school. Arrangements for follow up and six-monthly checks of height, weight and blood pressure are necessary. Atomoxetine is recommended for core symptoms of ADHD in children where psychostimulant medication is not appropriate, not tolerated or ineffective.

tolerance of side effects, dexamfetamine can be tried. The effect of psychostimulants occurs very quickly, in approximately 20 minutes, and lasts for only three or four hours.

The adverse effects include insomnia, reduced appetite, abdominal pain, gastrointestinal disturbance, headache and dizziness and less frequently, anxiety, irritability or tearfulness. Most of the short-term adverse effects are dose related and subject to differences between patients. They frequently diminish within 1-2 weeks of starting treatment, and usually disappear when treatment is discontinued, or the dose reduced.

There is some evidence that growth may be affected in certain children treated with psychostimulants, so growth should be monitored regularly. Debate remains about the association of tics with psychostimulant use but it is likely to be a weaker association than previously thought.

Psychostimulants are controlled drugs. Response to methylphenidate is assessed by means of a trial period, during which there should be close liaison with parents and the school. Once an optimum dose-response has been reached, arrangements for follow-up and six-monthly checks of height, weight and blood pressure are necessary. Good practice entails continuing liaison with the school to help in decisions regarding possible dose adjustments. For long-term prescribing of stimulant medication, shared care protocols should be developed between specialist services and GPs.

Methylphenidate is available in modified release forms, which can be particularly helpful for adolescents. There is no modified release form of dexamfetamine currently licensed in the UK.

Methylphenidate has a much lower abuse potential than cocaine, but abuse does occur, mainly by intravenous injection. ADHD per se may increase the risk of later substance misuse.

Many children on medication for ADHD will continue to require this to treat core ADHD symptoms during their teenage years. It is good practice to consider annual drug-free periods during adolescence to establish the continuing necessity, or not, of the medication.

Non-psychostimulant medication

Atomoxetine is recommended as treatment for core symptoms of ADHD in children where psychostimulant medication is not appropriate, not

tolerated or ineffective.

Adverse effects of atomoxetine include nausea and appetite reduction, dry mouth, insomnia, constipation and mood swings. These adverse effects are similar to those seen with psychostimulants and diminish over the first few months of treatment. Unlike psychostimulants, somnolence is commonly seen with atomoxetine. Atomoxetine is suggested to be less likely to cause sleep problems than psychostimulants, but there are no data delineating this from the somnolent adverse effect of the medication.

Unlike psychostimulants, the dose of atomoxetine is based upon body weight for individuals under 70 kg.

The effects of atomoxetine may not become apparent for four or more weeks. Once treatment is established, efficacy is described as being present over the 24-hour period, with possible greater effect over the 12 hours following administration. Initially, short-term combination with psychostimulant medication may be necessary during the transition phase.

Where atomoxetine is prescribed, clinicians should review at least six monthly, including assessment of ongoing efficacy and adverse effects and measurement of growth, pulse and blood pressure. Additional monitoring is advised for those at increased cardiovascular risk, hepatobiliary risk, seizure risk and potential suicidal ideation.

Diet and supplements

SIGN concluded that, as a good practice point, avoiding food and drinks that contain certain artificial colours and/or preservatives may help some children with ADHD/HKD. Parents should be advised to take reasonable steps to limit the number and variety of these in their children's diets, excluding any item that seems to provoke an extreme physical or behavioural reaction.

SIGN also recommends, as a good practice point, that clinicians should consider iron status when taking a history, with measurement of serum iron and ferritin, and treatment, where appropriate.

There was insufficient evidence on which to base a recommendation for omega-3, omega-6, zinc or antioxidants.

There was also insufficient evidence on which to base a recommendation for alternative therapies such as: Bach flower remedies; homoeopathy; massage therapy or neurofeedback.



CONCLUSION

ADHD is a common chronic condition which can adversely affect a child's development in many areas, and can also place a strain on family life.

The GP and the primary healthcare team are well placed to contribute to improving the recognition of ADHD in children (and indeed in adolescents and adults) and to the continuing management and support of the children and their parents.

REFERENCES

- 1 Palmer ED, Finger S. An early description of ADHD (inattentive subtype): Dr Alexander Crichton and 'Mental Restlessness' (1798). *Child and Adolescent Mental Health* 2001; 6(2): 66-73
- 2 NHS.QIS. Attention Deficit and Hyperkinetic Disorders: Services over Scotland. Report of the implementation review exercise. NHS Quality Improvement Scotland. Edinburgh. 2008
- 3 Faraone SV, Biederman J and Mick E. The age-dependent decline of attention deficit hyperactivity disorder: a meta-analysis of follow-up studies. *Psychol Med* 2006, 36(2): 159-165
- 4 Scottish Intercollegiate Guidelines Network. SIGN 112. Management of attention deficit and hyperkinetic disorders in children and young people: a national clinical guideline. SIGN. Edinburgh. 2009
- 5 National Institute for Health and Clinical Excellence. CG 72 Attention deficit hyperactivity disorder: diagnosis and management of ADHD in children, young people and adults. NICE. London. 2008

Useful information

SIGN 112

The guideline includes an information leaflet for parents/carers, at the end of which is a list of useful contacts. www.sign.ac.uk

ADISS (ADHD Information Services)

ADHD Information Services provides information for parents and doctors. www.addiss.co.uk

A HUNDRED YEARS AGO

Extracted from a 1910 issue of *The Practitioner*

CHRONIC GONORRHOEA IN THE FEMALE

By C.D. LOCHRANE, M.D., F.R.C.S.

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THERE is probably no disease affecting the female urinary genital organs which presents itself so often to the practitioner as the chronic variety of gonococcal infection. The successful treatment of the condition is invariably difficult, calling for considerable exercise of patience and discretion on the part of the medical attendant. Injudicious treatment, especially in the way of systematic curettings, etc., is not infrequently followed by extension of the disease.

In the treatment of chronic gonorrhoea the cardinal aims, are to destroy the gonococci at all points where they exist with the least possible injury to mucous membrane; to try to subdue inflammation, and to avoid all harmful influences.

There are certain essential points in treatment which must be insisted upon if we are to expect good results. Absolute rest in bed is essential during the period of treatment. The diet must be generous, though non-stimulating, and a large amount of fresh milk should be taken in addition to ordinary food. I invariably order at least three pints daily. Many women complain that they "never could take milk." If, however, the milk is heated (not boiled) and gr. xv. bicarbonate of soda per half pint are added to it, there will be found very few indeed who cannot take the amount I have stated. Coitus must be forbidden. As regards drugs, iron and arsenic in full doses should be given with a saline if necessary. I have found the citrate of iron and ammonium very satisfactory.

The *vulva* are first cleaned up thoroughly by washing with soap and water and then with a solution of biniodide of mercury; or the bichloride may be used after first washing away all discharge.

A copious vaginal douche of biniodide solution 1 : 4000 – or the bichloride as above – is then given once daily for four days. At the same time Bartholin's ducts and glands are treated. If the ducts alone are involved they should be swabbed out on each of these days with a solution of argyrols (20 per cent.) or a fine cotton-wool (sterile) probe. Or the argyrols may be injected into the duct with a blunt-pointed syringe. The treatment of this condition may prove

very troublesome, and in many cases it is best, if the condition resists treatment, to lay open the duct as thoroughly as possible on a probe-pointed director, swab out thoroughly with argyrols 20 per cent., and pack with gauze soaked in a weaker (5 per cent.) solution of the same material. If the gland itself is evidently involved it may have to be dissected out.

The cervix is then exposed, the cervical canal swabbed free from discharges, and Nabothian follicles present are laid open, and if there is any erosion it is burnt off with nitric acid or a 20 per cent. solution picric acid in alcohol. The cervical mucous membrane is then thoroughly rubbed over, up to the internal os, with a solution of one of the silver nitrate compounds – argyrols 20 per cent. is the best in my experience. The excess of solution is then wiped away and a small pencil-shaped piece of fresh German yeast is inserted into the mouth of the cervical canal, and a few grains of ordinary cane sugar are introduced immediately after it (sugar is necessary to promote the action of the yeast). Yeast has been proved to have a remarkably destructive effect on the gonococcus and upon most of the pyogenic cocci. A large piece of fresh yeast, with a few grains of sugar, is left against the cervix.

I repeat this treatment every second day for 10 days. The treatment is then stopped for a few days and the discharge is examined for gonococci. If any gonococci remain in the cervix their presence will be made obvious in any discharge which may remain after the completion of this treatment.

If the disease has not extended into the uterine cavity, this treatment is all that is necessary, and the results are often very satisfactory. The internal os must not be dilated or gone beyond in the process of manipulation, as the liability of the disease to spread upwards must be borne in mind.

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