

Quick reference guide

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Attention deficit hyperactivity disorder

Diagnosis and management of ADHD in children,
young people and adults

About this booklet

This is a quick reference guide that summarises the recommendations NICE has made to the NHS in Attention deficit hyperactivity disorder: diagnosis and management of ADHD in children, young people and adults (NICE clinical guideline 72).

Who should read this booklet?

This quick reference guide is for healthcare professionals and others involved in the care of people with attention deficit hyperactivity disorder.

Who wrote the guideline?

The guideline was developed by the National Collaborating Centre for Mental Health, which is based at the Royal College of Psychiatrists and the British Psychological Society. The Collaborating Centre worked with a group of healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, who reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

For more information on how NICE clinical guidelines are developed, go to www.nice.org.uk

Where can I get more information about the guideline?

The NICE website has the recommendations in full, reviews of the evidence they are based on, a summary of the guideline for patients and carers, and tools to support implementation (see back cover for more details).

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NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

This guidance represents the view of the Institute, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

Contents

Introduction	4
Definition of terms used in this guideline	4
Key priorities for implementation	5
Person-centred care	6
 Principles of treatment and care	7
 ADHD in children and young people	8
 ADHD in adults	15
 How to use drug treatment in children, young people and adults	17
 Monitoring side effects	20
 Behavioural and psychological interventions in children and young people	22
 Organisation and planning of services	23
 Training	23
Implementation tools	24
Further information	24

Introduction

This guideline covers the diagnosis and management of attention deficit hyperactivity disorder (ADHD) in children aged 3 years and older, young people and adults. The term 'children' refers to those between 3 and 11 years; 'young people' refers to those between 12 and 18 years.

ADHD is a heterogeneous behavioural syndrome characterised by the core symptoms of inattention, hyperactivity and impulsivity. Not every person with ADHD has all of these symptoms – some people are predominantly hyperactive and impulsive; others are mainly inattentive. Symptoms of ADHD are distributed throughout the population and vary in severity; only those people with at least a moderate degree of psychological, social and/or educational or occupational impairment in multiple settings should be diagnosed with ADHD. Determining the severity of ADHD is a matter for clinical judgement, taking into account severity of impairment, pervasiveness, individual factors and familial and social context.

Symptoms of ADHD can overlap with those of other disorders, and ADHD cannot be considered a categorical diagnosis. Therefore care in differential diagnosis is needed. ADHD is also persistent and many young people with ADHD will go on to have significant difficulties in adult life.

Definition of terms used in this guideline

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders 4th edition.

ICD-10: International Classification of Mental and Behavioural Disorders 10th revision.

Impairment: psychological, social and/or educational or occupational impairment.

Domains: refers to a type of social or personal functioning in which people ordinarily achieve competence, such as achievement in schoolwork or homework, dealing with physical risks and avoiding common hazards, and forming positive relationships with family and peers.

Settings: home, school, work or a healthcare setting.

Moderate ADHD: when symptoms of hyperactivity/impulsivity and/or inattention, or all three, occur together and are associated with at least moderate impairment in multiple settings and multiple domains.

Severe ADHD: corresponds approximately to the ICD-10 diagnosis of hyperkinetic disorder. This is when inattention, impulsivity and hyperactivity are all present in multiple settings, and when impairment is severe, affecting multiple domains in multiple settings.

Key priorities for implementation

- Trusts should ensure that specialist ADHD teams for children, young people and adults jointly develop age-appropriate training programmes for the diagnosis and management of ADHD for mental health, paediatric, social care, education, forensic and primary care providers and other professionals who have contact with people with ADHD.
- For a diagnosis of ADHD, symptoms of hyperactivity/impulsivity and/or inattention should:
 - meet the diagnostic criteria in DSM-IV or ICD-10 (hyperkinetic disorder)¹ **and**
 - be associated with at least moderate psychological, social and/or educational or occupational impairment based on interview and/or direct observation in multiple settings, **and**
 - be pervasive, occurring in two or more important settings including social, familial, educational and/or occupational settings.

As part of the diagnostic process, include an assessment of the person's needs, coexisting conditions, social, familial and educational or occupational circumstances and physical health. For children and young people there should also be an assessment of their parents' or carers' mental health.
- Healthcare professionals should offer parents or carers of pre-school children with ADHD a referral to a parent-training/education programme as the first-line treatment if the parents or carers have not already attended such a programme or the programme has had a limited effect.
- Teachers who have received training about ADHD and its management should provide behavioural interventions in the classroom to help children and young people with ADHD.
- If the child or young person with ADHD has moderate levels of impairment, the parents or carers should be offered referral to a group parent-training/education programme, either on its own or together with a group treatment programme (cognitive behavioural therapy [CBT] and/or social skills training) for the child or young person.
- In school-age children and young people with severe ADHD, drug treatment should be offered as the first-line treatment. Parents should also be offered a group-based parent-training/education programme.
- Drug treatment for children and young people with ADHD should always form part of a comprehensive treatment plan that includes psychological, behavioural and educational advice and interventions.

continued

¹ The ICD-10 exclusion on the basis of a pervasive developmental disorder being present, or the time of onset being uncertain, is not recommended.

Key priorities for implementation *continued*

- When a decision has been made to treat children or young people with ADHD with drugs, healthcare professionals should consider:
 - methylphenidate for ADHD without significant comorbidity
 - methylphenidate for ADHD with comorbid conduct disorder
 - methylphenidate or atomoxetine when tics, Tourette's syndrome, anxiety disorder, stimulant misuse or risk of stimulant diversion are present
 - atomoxetine if methylphenidate has been tried and has been ineffective at the maximum tolerated dose, or the child or young person is intolerant to low or moderate doses of methylphenidate.
- Drug treatment for adults with ADHD should always form part of a comprehensive treatment programme that addresses psychological, behavioural and educational or occupational needs.
- Following a decision to start drug treatment in adults with ADHD, methylphenidate should normally be tried first.

Person-centred care

Treatment and care should take into account peoples' individual needs and preferences. Good communication is essential, supported by evidence-based information, to allow people to reach informed decisions about their care. Follow Department of Health advice on seeking consent if needed. If the person agrees, families and carers should have the opportunity to be involved in decisions about treatment and care. If caring for young people in transition between paediatric and adult services, refer to 'Transition: getting it right for young people' (available from www.dh.gov.uk).

Principles of treatment and care

Respect, understanding and consent

- Develop a trusting relationship with all people with ADHD and their families or carers by:
 - respecting their knowledge and experience of ADHD
 - being sensitive to stigma concerning mental illness.
- During assessment and care of children or young people with ADHD:
 - allow them to give their own account of how they feel; record this in the notes
 - involve them and their family or carer in treatment decisions
 - take into account treatment expectations, so that parents or carers or the young person can give informed consent before treatment starts
 - be able to assess a young person's understanding of issues about ADHD and its treatment (including Gillick competence).
- Work with children and young people with ADHD and parents or carers to anticipate major life changes (such as puberty, starting school, or birth of a sibling) and arrange personal and social support. Consider psychological treatment at these times.
- Be familiar with local and national guidelines on confidentiality and the rights of the child, parental consent and responsibilities, child protection issues, the Mental Health Act (2007) and the Children Act (1989).

Providing information

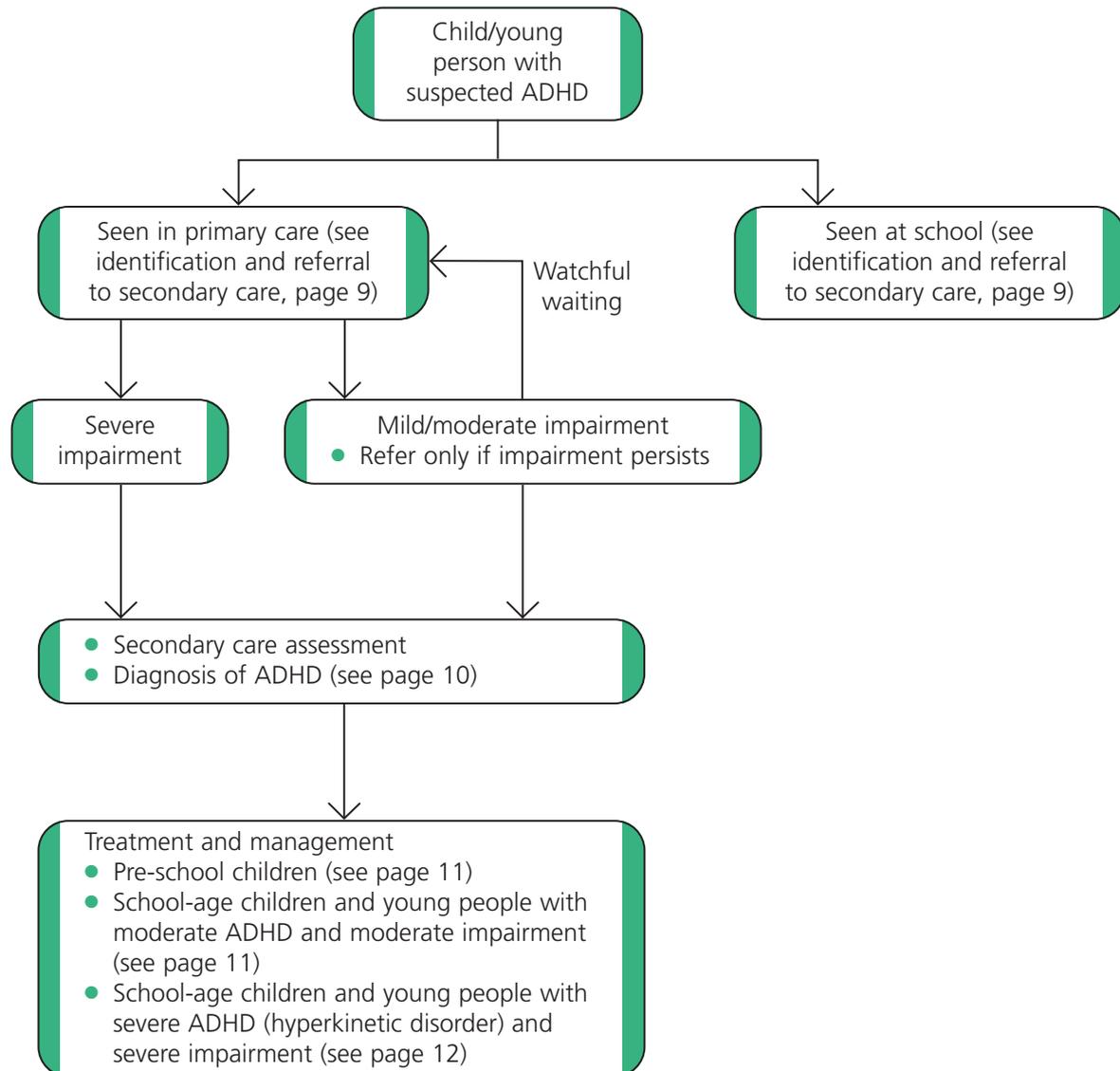
- Provide relevant, age-appropriate written information to people with ADHD and their families and carers about diagnosis, assessment, support, self-help, psychological treatment, drug treatment and possible side effects.
- Give adults with ADHD written information about local and national support groups and voluntary organisations.

Carer support

- Ask families or carers about the impact of ADHD on themselves and other family members and discuss their concerns.
- Offer families or carers an assessment of their personal, social and mental health needs.
- Encourage participation in support and self-help groups if appropriate.
- Advise about positive parent– and carer–child contact, clear and appropriate rules about behaviour and structuring the child or young person's day.
- Explain that parent-training/education programmes (see page 22) aim to optimise parenting skills to meet the above-average parenting needs of children and young people with ADHD and do not necessarily imply bad parenting.

ADHD in children and young people

Care pathway



Identification and referral to secondary care

School

- Universal screening for ADHD should not be undertaken in schools or nurseries.
- On referral to a special educational needs coordinator (SENCO), the SENCO should:
 - help children or young people with disordered conduct and suspected ADHD with their behaviour
 - inform the parents about local parent-training/education programmes (see page 22).

- If a child or young person is referred to secondary care, inform the GP.

Primary care

- Determine the severity of behavioural and/or attention problems suggestive of ADHD and how they affect the child or young person and their parents or carers in different domains and settings.
- If the problems are having an adverse impact on development or family life, consider:
 - watchful waiting for up to 10 weeks
 - offering referral to a parent-training/education programme (see page 22); this should not wait for a formal diagnosis of ADHD.
- If the problems persist with at least moderate impairment, refer to secondary care (paediatrician, child psychiatrist or specialist ADHD child and mental health services [CAMHS]).
- If the problems are associated with severe impairment, refer directly to secondary care.

- Do not diagnose or start drug treatment for ADHD in children and young people in primary care.
- If a child or young person is currently receiving drug treatment for ADHD and has not yet been assessed in secondary care, refer to a paediatrician, child psychiatrist or to specialist ADHD CAMHS as a clinical priority.

Diagnosis of ADHD

- Diagnosis should only be made by a specialist psychiatrist, paediatrician or other healthcare professional with training and expertise in the diagnosis of ADHD.
- Diagnosis should be based on:
 - a full clinical and psychosocial assessment. Discuss behaviour and symptoms in the different domains and settings of the person's everyday life
 - a full developmental and psychiatric history, and
 - observer reports and an assessment of mental state.
- Diagnosis should be made when symptoms of hyperactivity/impulsivity and/or inattention:
 - meet the criteria in DSM-IV or ICD-10 (hyperkinetic disorder), **and**
 - are associated with at least moderate psychological, social and/or educational or occupational impairment based on interview and/or observation in multiple settings, **and**
 - are pervasive, occurring in at least two settings.
- As part of the diagnostic process, include an assessment of needs, coexisting conditions, social, familial and educational or occupational circumstances and physical health. For children and young people also include an assessment of the parents' or carer's mental health.
- Do not diagnose ADHD based on rating scales or observational data alone. However, rating scales² are valuable adjuncts, and observations (for example, at school) are useful if there is doubt about symptoms.
- ADHD should be considered in all age groups. Adjust symptom criteria for age-appropriate changes in behaviour.
- Take into account children or young people's views when determining the clinical significance of impairment.

Advice after diagnosis

- Consider providing parents and carers with self-instruction manuals and other materials such as videos, based on positive parenting and behavioural techniques.
- Stress the value of a balanced diet, good nutrition and regular exercise for children and young people with ADHD³.
- Eliminating artificial colouring and additives from the diet is not recommended as a generally applicable treatment for ADHD.
- Dietary fatty acids supplements are not recommended for the treatment of ADHD.
- Advise parents or carers to keep a diary if there are foods or drinks that appear to affect behaviour. If the diary supports a link between any foods or drinks and behaviour, offer referral to a dietitian. Further management (such as elimination of specific foods) should be jointly undertaken by the dietitian, mental health specialist or paediatrician and the family.

² For example, Conners' rating scales and the Strengths and Difficulties questionnaire.

³ This also applies to adults with ADHD.

Treatment and management

- Contact the teacher, with the parent or carer's consent, to explain the diagnosis, severity of symptoms and impairment, the care plan and any special educational needs.
- Teachers trained in ADHD and its management should provide behavioural interventions in class.

Pre-school children

- Drug treatment is not recommended.
- Offer parents or carers referral to a parent-training/education programme as first-line treatment (see page 22) if they have not attended one, or if it has been only partially effective.
- If treatment is effective, before discharge from secondary care:
 - review the child with their parents or carers and siblings for residual coexisting conditions and develop a treatment plan for these if necessary
 - monitor for recurrence of ADHD symptoms and associated impairment after the child starts school.
- If treatment is ineffective consider referral to tertiary services.

School-age children and young people with moderate ADHD and moderate impairment

- Drug treatment is not indicated as first-line treatment.
- Offer parents or carers referral to a group parent-training/education programme (see page 22) on its own or with other group treatment (cognitive behavioural therapy [CBT] and/or social skills training) for the child or young person.
- Consider individual psychological interventions (such as CBT or social skills training) for older adolescents.
- Where ADHD is present with a learning disability, offer referral to an individual or group parent-training/education programme according to the preference of the child or young person and the parents or carers.
- If treatment is effective, before discharge from secondary care, review the child or young person with their parents or carers and siblings for residual problems such as anxiety, aggression or learning difficulties. Develop a treatment plan for these if necessary.
- Reserve drug treatment for children and young people with:
 - moderate impairment where non-drug interventions have been refused
 - persisting significant impairment following a parent-training/education programme or group psychological treatment.

School-age children and young people with severe ADHD (hyperkinetic disorder) and severe impairment

- Offer drug treatment as first-line treatment (see below). Also offer the parents a group-based parent-training/education programme (see page 22).
- If drug treatment is not accepted, advise parents or carers and the child or young person of the benefits and superiority of drug treatment. If drug treatment is still not accepted offer a group parent-training/education programme.
- If group parent-training/education is effective for those who refused drug treatment:
 - assess for coexisting conditions
 - develop a longer-term care plan.
- If group parent-training/education is ineffective for those who refused drug treatment:
 - discuss drug treatment again, or other psychological treatment (group CBT and/or social skills training)
 - highlight the benefits and superiority of drug treatment in severe ADHD.

Drug treatment in children and young people

- Drug treatment should:
 - only be started by a healthcare professional with expertise in ADHD
 - be based on comprehensive assessment⁴
 - always form part of a comprehensive treatment plan that includes psychological, behavioural and educational advice and interventions.
- GPs may continue prescribing and monitoring drug treatment under shared care arrangements⁴.
- Carry out a pre-drug treatment assessment first. Include:
 - a full mental health and social assessment
 - a full history and physical examination, including:
 - ◆ assessment of history of exercise syncope, undue breathlessness and other cardiovascular symptoms
 - ◆ heart rate and blood pressure (plot on a centile chart)
 - ◆ height and weight (plot on a growth chart)
 - ◆ family history of cardiac disease and examination of the cardiovascular system
 - an electrocardiogram (ECG) if there is past medical or family history of serious cardiac disease, a history of sudden death in young family members or abnormal findings on cardiac examination
 - risk assessment for substance misuse and drug diversion.

⁴ Summarised from NICE technology appraisal guidance 98 (www.nice.org.uk/TA098)

Choice of drug treatment

- Methylphenidate, atomoxetine and dexamfetamine are recommended, within their licensed indications, as options for the management of ADHD⁵.
- Decide which drug treatment to use based on:
 - comorbidities (for example, tics, Tourette's syndrome, epilepsy)
 - their different adverse effects
 - potential problems with compliance (for example, if a mid-day dose is needed at school)
 - potential for drug diversion and misuse
 - preferences of the child or young person and their parent or carer⁵.
- Consider:
 - methylphenidate for ADHD without significant comorbidity
 - methylphenidate for ADHD with comorbid conduct disorder
 - methylphenidate or atomoxetine in the presence of tics, Tourette's syndrome, anxiety disorder, stimulant misuse or risk of stimulant diversion
 - atomoxetine if methylphenidate has been tried and has been ineffective at the maximum tolerated dose, or the child or young person is intolerant to low or moderate doses of methylphenidate.
- If using methylphenidate, consider:
 - modified-release preparations for convenience, their pharmacokinetic profile, improving adherence, reducing stigma (because the drug does not need to be taken at school), and reducing problems of storing and administering controlled drugs in schools
 - immediate-release preparations if more flexible dosing is required or during initial titration to determine correct dosing levels.
- If there is a choice of more than one drug, use the drug of lowest overall cost⁵.
- Do not use antipsychotics for ADHD in children and young people.

Side effects

- Monitor children and young people starting drug treatment for side effects (see table 3 on pages 20–21).
- Closely observe children or young people taking atomoxetine for agitation, irritability, suicidal thinking and self-harming behaviour, and unusual changes in behaviour, particularly during the initial months of treatment, or after a dose change.
- With atomoxetine, warn parents or carers about the potential for:
 - suicidal thinking and self-harm; ask them to report these effects
 - liver damage in rare cases (usually presenting as abdominal pain, unexplained nausea, malaise, darkening of the urine or jaundice).

⁵ Summarised from NICE technology appraisal guidance 98 (www.nice.org.uk/TA098). At the time of publication, methylphenidate and atomoxetine did not have UK marketing authorisation for use in children younger than 6 years. Informed consent should be obtained and documented.

Poor response to treatment

- If there has been a poor response to methylphenidate and atomoxetine together with parent-training/education programmes and/or psychological treatment, review:
 - the diagnosis
 - any coexisting conditions
 - response to drug treatment, side effects and adherence
 - uptake and use of psychological interventions
 - whether stigma has affected treatment acceptability
 - concerns related to school and/or family
 - motivation of the child or young person and their parents or carers
 - the child or young person's diet.
- After review of poor response to drug treatment, and consultation with a tertiary or regional centre, consider:
 - increasing the dose of methylphenidate to 0.7 mg/kg up to three times a day, or a total daily dose of 2.1 mg/kg/day (up to a total maximum of 90 mg/day for immediate release, or the equivalent modified-release dose. For details of methylphenidate dose equivalents, see table 1 on page 17)
 - increasing the dose of atomoxetine to 1.8 mg/kg/day (up to a total maximum dose of 120 mg/day).

These doses are higher than recommended in the British National Formulary (BNF).

Monitor closely for side effects.

- Consider dexamfetamine when symptoms are unresponsive to a maximum tolerated dose of methylphenidate or atomoxetine.
- If there is no response to methylphenidate, atomoxetine or dexamfetamine, treat further only after referral to tertiary services. Further treatment may include drugs unlicensed for ADHD⁶ (such as bupropion, clonidine⁷, modafinil and imipramine) or combination treatments (including psychological treatments for the parent or carer and the child or young person).

Transition to adult services

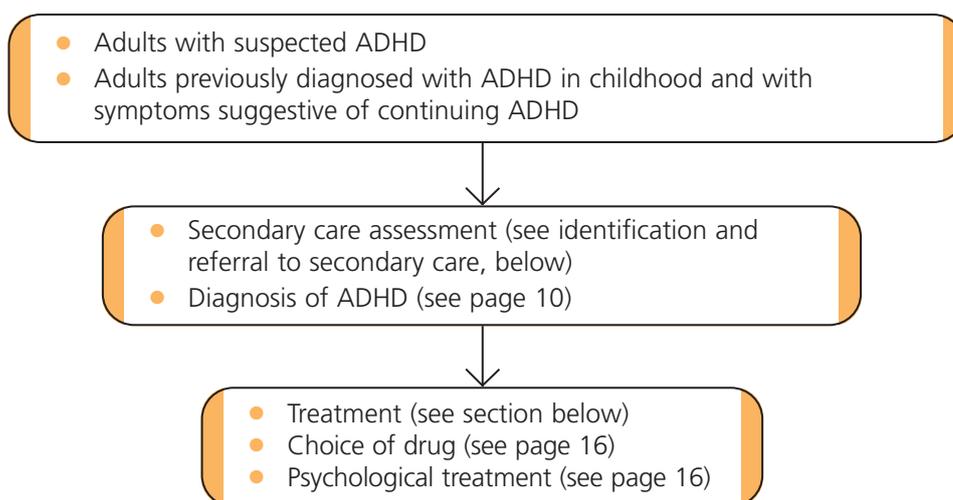
- Reassess a young person treated in CAMHS or paediatric services at school-leaving age to determine if treatment needs to be continued. If it does, arrange for transition to adult services (usually by age 18), giving details of the anticipated treatment and services required.
- Consider a formal meeting involving CAMHS and/or paediatrics and adult psychiatric services. Give the young person information about adult services and involve them, and their parent or carer, in the planning. Use the care programme approach for young people aged 16 years and older.
- After transition, carry out an assessment of personal, educational, occupational and social functioning, and coexisting conditions, especially drug misuse, personality disorders, emotional problems and learning difficulties.

⁶ At the time of publication, bupropion, clonidine, modafinil and imipramine did not have UK marketing authorisation for use in children and young people with ADHD. Informed consent should be obtained and documented.

⁷ Carry out cardiovascular examination and ECG before starting treatment with clonidine.

ADHD in adults

Care pathway



Identification and referral to secondary care

- Refer adults with ADHD symptoms and moderate or severe impairment that have persisted from childhood and are not explained by other psychiatric diagnoses (although other psychiatric conditions may coexist) to a mental health specialist trained in the diagnosis and treatment of ADHD.
- Refer adults who have been treated for ADHD in childhood and have symptoms suggestive of continuing ADHD associated with moderate or severe impairment to general adult psychiatric services.

Treatment

- Drug treatment should be:
 - the first-line treatment unless the person prefers psychological treatment
 - started only under the guidance of a psychiatrist, nurse prescriber specialising in ADHD or other clinical prescriber with training in ADHD diagnosis and management
 - part of a comprehensive treatment programme addressing psychological, behavioural and educational or occupational needs.
- Carry out a pre-drug treatment assessment first. Include:
 - a full mental health and social assessment
 - a full history and physical examination, including:
 - ♦ assessment of history of exercise syncope, undue breathlessness and other cardiovascular symptoms
 - ♦ heart rate and blood pressure (plot on a centile chart)
 - ♦ weight
 - ♦ family history of cardiac disease and examination of the cardiovascular system
 - an electrocardiogram (ECG) if there is past medical or family history of serious cardiac disease, a history of sudden death in young family members or abnormal findings on cardiac examination
 - risk assessment for substance misuse and drug diversion.

Choice of drug⁸

- Methylphenidate should normally be tried first.
- Consider atomoxetine or dexamfetamine if symptoms do not respond to methylphenidate or the person is intolerant to it after an adequate trial (usually about 6 weeks). Exercise caution if prescribing dexamfetamine to people at risk of stimulant misuse or diversion.
- Consider atomoxetine as first-line treatment if there are concerns about drug misuse and diversion (for example, in prison).
- Drug treatment for people who misuse substances should only be prescribed by healthcare professionals with expertise in managing both ADHD and substance misuse. For adults with ADHD and drug or alcohol addiction disorders, there should be close liaison between the professional treating the ADHD and an addiction specialist.
- Do not use antipsychotics for ADHD in adults.

Side effects

- Monitor adults starting drug treatment for side effects (see table 3 on pages 20–21).
- Closely observe adults taking atomoxetine for agitation, irritability, suicidal thinking and self-harming behaviour, and unusual changes in behaviour, particularly during the initial months of treatment, or after a dose change.
- With atomoxetine, warn about the potential for:
 - increased agitation, anxiety, suicidal thinking and self-harming behaviour in some adults aged 30 years or younger, especially during the first few weeks of treatment
 - liver damage in rare cases (usually presenting as abdominal pain, unexplained nausea, malaise, darkening of the urine or jaundice).

Psychological treatment

- Consider group or individual CBT for adults who:
 - are stabilised on medication but have persisting functional impairment associated with ADHD
 - have partial or no response to drug treatment or who are intolerant to it
 - have made an informed choice not to have drug treatment
 - have difficulty accepting the diagnosis of ADHD and accepting and adhering to drug treatment
 - have remitting symptoms and psychological treatment is considered sufficient to treat mild to moderate residual functional impairment.
- Offer group therapy first because it is the most cost effective.

⁸ At the time of publication, methylphenidate, dexamfetamine and atomoxetine did not have UK marketing authorisation for use in adults with ADHD. However, atomoxetine is licensed for adults with ADHD when the drug has been started in childhood. Informed consent should be obtained and documented.

How to use drug treatment in children, young people and adults

- Prescribers should be familiar with:
 - the pharmacokinetic profiles of all ADHD preparations in order to tailor treatment to individual needs
 - controlled drug legislation governing prescription and supply of stimulants.
- During titration:
 - gradually increase the dose until there is no further improvement in symptoms, behaviour, education and/or relationships and side effects are tolerable. Methylphenidate and dexamfetamine should be titrated over 4–6 weeks
 - in children and young people, parents and teachers should record symptoms and side effects at each dose change (for example, on Conners' 10-item scale)
 - in adults, record symptoms and side effects at each dose change, after discussion with the person and if possible, a spouse, parent, close friend or carer
 - review progress regularly (for example, by weekly telephone contact and at each dose change).
- Dose titration should be slower if tics or seizures are present.
- Routinely monitor and record side effects of drug treatment.
- Consider dose reduction if side effects become troublesome, see table 3 on pages 20–21.
- After titration and dose stabilisation, carry out prescription and monitoring under locally agreed shared care arrangements with primary care.
- For details of initial, titration and maximum doses, see table 2 on page 18.

Table 1 Methylphenidate: immediate- and modified-release dose equivalents (mg)

IR-MPH	Concerta XL	Equasym XL	Medikinet XL
10	–	10	10
15	18	–	–
20	–	20	20
30	36	30	30
–	–	–	40
45	54	–	–
60	72*	60	–

IR-MPH: immediate-release methylphenidate; Concerta XL, Equasym XL and Medikinet XL: brands of modified-release methylphenidate
 * Licensed up to 54 mg

Table 2 Initial, titration and maximum doses

	Initial treatment	Titration and dose
Methylphenidate	Children aged 6 years and older and young people	Begin with low doses consistent with starting doses in the BNF.
	Adults	Offer modified-release preparations as a single dose in the morning. Offer immediate-release preparations in two or three divided doses.
Atomoxetine	Children aged 6 years and older and young people	Begin with low doses (5 mg three times daily for immediate-release preparations or the equivalent modified-release dose).
	Adults	Increase dose according to response up to a maximum of 100 mg/day. Modified-release preparations may increase adherence and be preferred if there is concern about misuse or diversion. Normally offer these once daily, but no more than twice daily. Offer immediate-release preparations up to four times daily.
Dexamfetamine	Children aged 6 years and older and young people	Up to 70 kg body weight: increase dose after 7 days to approximately 1.2 mg/kg/day. Over 70 kg body weight: increase after 7 days up to a maintenance dose of 80 mg/day. Offer a single daily dose, or two divided doses to minimise side effects.
	Adults	Up to 70 kg body weight: use a total starting dose of approximately 0.5 mg/kg/day. Over 70 kg body weight: use a total starting dose of 40 mg/day. Up to 70 kg body weight: increase dose after 7 days to approximately 1.2 mg/kg/day. Over 70 kg body weight: increase after 7 days up to a maximum maintenance dose of 100 mg/day. The usual maintenance dose is 80 or 100 mg/day which can be offered in divided doses. Trial this dose for 6 weeks to determine effectiveness.
Dexamfetamine	Children aged 6 years and older and young people	Begin with low doses consistent with starting doses in the BNF.
	Adults	Offer divided doses, increasing to a maximum of 20 mg/day. Children aged 6–18 years: up to 40 mg/day may occasionally be required.
	Children aged 6 years and older and young people	Begin with low doses of 5 mg twice daily.
	Adults	Increase dose according to response up to a maximum of 60 mg/day. Offer divided doses, usually between two and four times daily.

BNF: British National Formulary

Improving treatment adherence in children and young people

- Use simple drug regimens (for example, once-daily modified-release doses)⁹.
- Improve communication with children and young people by educating parents or carers and ensuring there are regular three-way conversations with the child or young person and the parents or carers (and, for adults, a partner or close friend).
- Offer¹⁰:
 - clear instructions (pictures or written) about how to take the drug
 - encouragement to children and young people to be responsible for their own health and taking medication. Support parents and carers in this.
- Consider peer-support groups if adherence is difficult or uncertain.
- Advise parents and carers:
 - about providing reminders to take medication regularly (for example, alarms, clocks, pill boxes or notes on calendars or fridges)
 - to help children and young people incorporate medication in daily routines
 - to help children and young people develop a positive attitude about taking medication, including praise and positive reinforcement.

Duration of treatment and follow up

- Continue treatment for as long as it is effective. Review at least annually in children and young people, and annually in adults. Include in the review:
 - clinical need, benefits and side effects
 - the views of the person with ADHD, and those of parents, carers and teachers, a spouse or close friend, as appropriate
 - the effect of missed doses, planned dose reductions and brief periods of no treatment
 - the preferred pattern of drug use
 - coexisting conditions; treat or refer if necessary
 - the need for psychological, social and occupational support for the person and their parents or carers.
- Consider working with the child or young person and their parents or carers to find the best pattern of drug use, which may include periods without treatment. Drug holidays are not routinely recommended.
- Adopt an individual treatment approach for adults. Review patterns of use at least annually, considering the effect of drug treatment on coexisting conditions and mood changes.

⁹ This also applies to adults with ADHD.

¹⁰ Consider similar strategies for adults, adapted for age.

Monitoring side effects

- Consider using standard symptom and side effect rating scales during treatment as an adjunct to clinical assessment.
- Routine blood tests and ECGs are not recommended unless there is a clinical indication.
- Liver damage is a rare and idiosyncratic side effect of atomoxetine – routine liver tests are not recommended. Warn people with ADHD and parents or carers of the rare potential for liver damage (usually presenting as abdominal pain, unexplained nausea, malaise, darkening of the urine or jaundice).

Table 3 Monitoring side effects

Monitoring and intervention	Monitor according to drug treatment		
	Methylphenidate	Atomoxetine	Dexamfetamine
<p>Height</p> <ul style="list-style-type: none"> • Measure every 6 months. Plot on a growth chart, which should be reviewed by the healthcare professional responsible for treatment. • If growth is affected significantly consider a break in drug treatment over school holidays to allow 'catch-up' growth. 	Children and young people	Children and young people	Children and young people
<p>Weight</p> <ul style="list-style-type: none"> • Measure 3 and 6 months after the start of treatment, and every 6 months thereafter. In children and young people, plot weight on a growth chart, which should be reviewed by the healthcare professional responsible for treatment. • In adults, if weight loss is associated with drug treatment, consider monitoring body mass index and changing the drug if weight loss persists. • Strategies to reduce weight loss, or manage decreased weight gain in children, include: <ul style="list-style-type: none"> – taking medication either with or after food, rather than before meals – eating additional meals or snacks early morning or late evening when stimulant effects have worn off – obtaining dietary advice and eating high-calorie foods of good nutritional value. 	Children, young people and adults	Children, young people and adults	Children, young people and adults
<p>Cardiac function and blood pressure</p> <ul style="list-style-type: none"> • Monitor heart rate and blood pressure and record on a centile chart before and after each dose change, and every 3 months. • Sustained resting tachycardia, arrhythmia or systolic blood pressure greater than the 95th percentile (or a clinically significant increase) measured on two occasions should prompt dose reduction and referral to a paediatrician or physician. 	Children, young people and adults	Children, young people and adults	Children, young people and adults

Table 3 Monitoring side effects *continued*

Monitoring and intervention	Monitor according to drug treatment		
	Methylphenidate	Atomoxetine	Dexamfetamine
<p>Reproductive system and sexual function</p> <ul style="list-style-type: none"> Monitor for dysmenorrhoea, erectile dysfunction and ejaculatory dysfunction. 	–	Young people and adults	–
<p>Seizures</p> <ul style="list-style-type: none"> If exacerbated in a child with epilepsy or de novo seizures emerge, discontinue methylphenidate or atomoxetine immediately. Consider dexamfetamine instead after discussion with a regional tertiary specialist treatment centre. 	Children and young people	Children and young people	–
<p>Tics</p> <ul style="list-style-type: none"> Consider whether tics are stimulant-related, and whether tic-related impairment outweighs the benefits of ADHD treatment. If stimulant-related, reduce the dose or stop drug treatment or consider using atomoxetine instead. 	Children, young people and adults	–	Children, young people and adults
<p>Psychotic symptoms (delusions, hallucinations)</p> <ul style="list-style-type: none"> Withdraw drug treatment and carry out full psychiatric assessment. Consider atomoxetine instead. 	Children, young people and adults	–	Children, young people and adults
<p>Anxiety symptoms including panic</p> <ul style="list-style-type: none"> Where symptoms are precipitated by stimulants, particularly in adults with a history of coexisting anxiety, use lower doses of the stimulant and/or combined treatment with an antidepressant used to treat anxiety. Switching to atomoxetine may be effective. 	Children, young people and adults	–	Children, young people and adults
<p>Agitation, irritability, suicidal thinking and self-harm</p> <ul style="list-style-type: none"> Closely observe especially during the initial months of treatment or after a change in dose. Warn parents/carers about the potential for suicidal thinking and self-harm with atomoxetine, ask them to report these effects. Warn adults (aged 30 years or younger) of possible increased agitation, anxiety, suicidal thinking and self-harming behaviour, especially in the first weeks of treatment. 	–	Children, young people and adults	–
<p>Drug misuse and diversion</p> <ul style="list-style-type: none"> Monitor changes in potential for misuse and diversion, which may come with changes in circumstances and age. Modified-release methylphenidate or atomoxetine may be preferred. 	Children and young people	–	Children and young people

Behavioural and psychological interventions in children and young people

Parent-training/education programmes

- All programmes should demonstrate proven effectiveness and:
 - be structured and informed by social-learning theory
 - include relationship-enhancing strategies
 - offer sufficient sessions, ideally 8–12
 - enable parents to identify their own parenting objectives
 - incorporate role-play during sessions and homework
 - be delivered by supervised, appropriately trained and skilled facilitators
 - be consistently implemented and follow the developer's manual¹¹.
- Both parents or all carers should be included in the programme wherever possible.
- Programme providers should ensure support is available to allow participation of parents who might find it difficult to access these programmes¹¹.
- Programme providers should consider giving the child or young person's teacher written information on the areas of behavioural management covered in the sessions, with parental consent.

Group-based parent-training/education programmes

- Group-based programmes developed for the treatment and management of children with conduct disorders¹¹ should be accessible to parents or carers of children with ADHD whether or not the child also has conduct disorder.

Individual-based parent-training/education programmes

- Offer individual-based programmes when there are:
 - low participant numbers
 - difficulties for families in attending group sessions (for example, because of disability, diversity needs such as language differences, parental ill health, problems with transport)
 - family needs that are too complex for a group-based programme.
- Involve the child in the skills-training stages of individual-based programmes for pre-school children, as well as the parents or carers.

Group CBT and social skills training

- When group treatment (CBT and/or social skills training) for the child or young person and a parent-training/education programme are offered, target a range of areas including:
 - social skills with peers
 - problem solving
 - self-control
 - listening skills
 - dealing with and expressing feelings.
- Use active learning strategies and give rewards for achieving key elements of learning.

¹¹ Summarised from NICE technology appraisal guidance 102 (www.nice.org.uk/TA102).

Organisation and planning of services

Multidisciplinary specialist ADHD teams

- Mental health trusts, and children's trusts that provide mental health/child development services, should form multidisciplinary specialist ADHD teams and/or clinics for children and young people and separate teams and/or clinics for adults. These teams and clinics should have expertise in the diagnosis and management of ADHD, and should:
 - provide diagnostic, treatment and consultation services for people with ADHD who have complex needs, or where general psychiatric services are in doubt about the diagnosis and/or management of ADHD
 - put in place systems of communication and protocols for information sharing among paediatric, child and adolescent, forensic, and adult mental health services for people with ADHD, including arrangements for transition between child and adult services
 - produce local protocols for shared care arrangements with primary care providers, and ensure that clear lines of communication between primary and secondary care are maintained
 - ensure age-appropriate psychological services are available for children, young people and adults with ADHD, and for parents or carers.

The size and time commitment of these teams should depend on local circumstances (for example, the size of the trust, the population covered and the estimated referral rate for people with ADHD).

Multi-agency groups

- Every locality should form a multi-agency group, with representatives from multidisciplinary specialist ADHD teams, paediatrics, mental health and learning disability trusts, forensic services, CAMHS, the Children and Young People's Directorate including education and social services, parent support groups and others with a significant local involvement in ADHD services. The group should:
 - oversee implementation of this guideline
 - start and coordinate local training initiatives, including training and information for teachers about the characteristics of ADHD and its basic behavioural management
 - oversee the development and coordination of parent-training/education programmes
 - consider compiling a comprehensive directory of information and services for ADHD including advice on how to contact relevant services and assist in the development of specialist teams.

Training

- Trusts should ensure that specialist ADHD teams for children, young people and adults jointly develop age-appropriate training programmes for the diagnosis and management of ADHD for mental health, paediatric, social care, education, forensic and primary care providers and other professionals who have contact with people with ADHD.
- Child and adult psychiatrists, paediatricians and other child and adult mental health professionals (including those working in forensic services) should undertake training so that they are able to diagnose ADHD and provide treatment and management according to this guideline.
- The Department for Children, Schools and Families should consider providing more education to trainee teachers about ADHD by working with the Training and Development Agency for Schools and relevant health service organisations to produce training programmes and guidance for supporting children with ADHD.

Implementation tools

NICE has developed tools to help organisations implement this guidance.

These are available on our website (www.nice.org.uk/CG072).

Further information

Ordering information

You can download the following documents from www.nice.org.uk/CG072

- A quick reference guide (this document) – a summary of the recommendations for healthcare professionals.
- The NICE guideline – all the recommendations.
- ‘Understanding NICE guidance’ – information for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or ‘Understanding NICE guidance’, phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N1684 (quick reference guide)
- N1685 (‘Understanding NICE guidance’).

Related NICE guidance

For information about NICE guidance that has been issued or is in development, see the website (www.nice.org.uk).

Published

Drug misuse: psychosocial interventions. NICE clinical guideline 51 (2007). Available from: www.nice.org.uk/CG051

Parent-training/education programmes in the management of children with conduct disorders. NICE technology appraisal guidance 102 (2006). Available from: www.nice.org.uk/TA102

Methylphenidate, atomoxetine and dexamfetamine for attention deficit hyperactivity disorder (ADHD) in children and adolescents (review of technology appraisal 13). NICE technology appraisal guidance 98 (2006). Available from: www.nice.org.uk/TA098

Under development

Antisocial personality disorder: treatment, management and prevention. NICE clinical guideline (publication expected January 2009).

Borderline personality disorder: treatment and management. NICE clinical guideline (publication expected January 2009).

Updating the guideline

This guideline will be updated as needed, and information about the progress of any update will be posted on the NICE website (www.nice.org.uk/CG072).

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