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module 251

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Welcome to the two hundred and fifty first module in the *Pharmacy Magazine* Continuing Professional Development Programme, which looks at **attention deficit hyperactivity disorder (ADHD)**.

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forthismodule

GOAL

To provide community pharmacists with a deeper understanding of child and adolescent ADHD.

OBJECTIVES:

After completing this module you should be able to:

- List the core symptoms of ADHD
- Explain the co-morbidities that commonly accompany ADHD
- Describe both the non-drug approaches and the medicines available to manage ADHD.

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Attention deficit hyperactivity disorder

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Introduction

Attention deficit hyperactivity disorder (ADHD) is characterised by the presence of three core symptoms:

- Hyperactivity
- Inattention
- Impulsivity that is developmentally inappropriate.

ADHD can continue into, or be diagnosed in adulthood. This module will focus on children and adolescents between six and 18 years of age. Throughout the module, children and adolescents will be referred to as patients but where there is a need to focus on a particular age range, the word 'child' will be used to denote someone between six and 12 years of age and 'adolescent' used for someone between 12 and 18 years of age.

Table 1 shows the three core symptoms of ADHD and the typical behaviours and traits associated with them. In addition to this, comments and

Table 1: Core symptoms of attention deficit hyperactivity disorder

Hyperactivity	Impulsivity	Inattention
Patient is... constantly moving	Difficulty waiting his/her turn	Easily distracted
Runs about or climbs excessively in situations when it is not appropriate	Interrupts conversation	Short attention span
Talks excessively	Blurts out answer before question has been completed	Does not seem to listen when spoken to directly
Fidgets or squirms in seat	Does things or says things without regard for the consequences (e.g. runs across a road without looking)	Does not follow through on instructions
Leaves seat in classroom or other situation in which remaining seated is expected		Fails to give close attention to detail and makes careless mistakes

descriptions used by parents and patients to describe the symptoms of ADHD are interspersed throughout the module.

It is very important to consider the core symptoms of ADHD in the context of the individual's chronological and developmental age, as the two can be different.

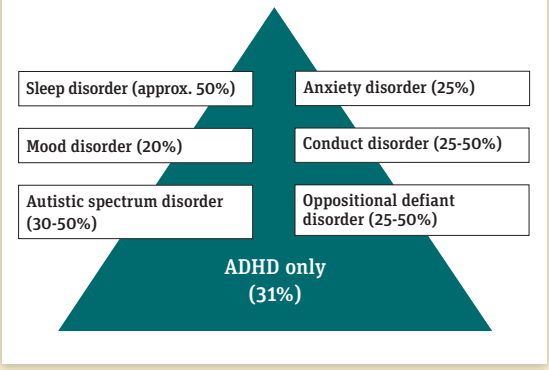
Prevalence rates for ADHD vary between literature and countries but the rate is usually put at between 3 and 9 per cent in the UK, which roughly translates to between one and three children in an average classroom. Around two-thirds of adolescents will continue to meet the diagnosis into adulthood. In terms of gender, ADHD is diagnosed at a ratio of roughly four boys to one girl.

ADHD fits into the category of neuro-developmental disorders. Table 2 (below) shows other categories and some common childhood disorders that sit under them.

Co-morbidities

ADHD is seldom a pure diagnosis. In two-thirds of cases ADHD is accompanied by other co-morbidities. The commonest of these are shown in Figure 1 above.

Figure 1: Co-morbidities associated with ADHD



The overlap represents similarities between ADHD symptoms and co-morbid symptoms, which can add to the complexity of diagnosis and ongoing management. The number in brackets shows approximately how often the co-morbidity is associated with ADHD.

Table 2: Common childhood disorders and their categories

Neurodevelopmental	Behavioural	Emotional
ADHD	Conduct disorder	Anxiety (various types)
Autistic spectrum disorder	Oppositional defiant disorder	Obsessive compulsive disorder
		Depression

> "I feel an energy that starts from my feet and works up me. That is when I have to get up and do something"

Aetiology and pathophysiology

There is no exclusive risk factor that contributes to ADHD. Instead, the risk of getting ADHD is likely to be due to a complex interaction between biological, physical risk and family/environmental factors. Further details on these risk factors are described in Table 3.

The pathophysiology of ADHD is unclear but there is growing evidence that it is a neuro-biological problem. The two neurotransmitters thought to be involved are dopamine and noradrenaline. At normal levels, these neurotransmitters allow messages to be passed effectively from one neurone to another across the synapse. This, in turn, is thought to help with attention span, organisation, impulse control and regulation of emotion.

In patients with ADHD, there is thought to be a deficiency in the level of these two neurotransmitters that leads to the classic difficulties patients with ADHD display. Studies involving MRI scans and neuroimaging have also implicated delayed brain growth, smaller regions of the brain and hypoperfusion.

Diagnosis

Diagnosing ADHD is challenging, particularly as there is no formal blood test or scan. Arriving at a diagnosis typically takes up to a year but can take longer in more complex cases. The reason for this is because a comprehensive assessment needs to take place.

Diagnostic and Statistical Manual of Mental Disorders (DSM V) criteria are described in Table 4, but the International Classification of Disease (ICD) can also be used.

Once a diagnosis has been made, ADHD can be classified as one of the following:

> "He has no sense of danger"

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Table 3: Risk factors for ADHD

Type of risk factor	Description of evidence
Biological	There is strong evidence of a genetic link. Studies on monozygotic (identical) twins report that if one twin has ADHD, the chances of the other having it will be around 80 per cent
	Around 40-60 per cent of parents with ADHD will have a child with the disorder
	If a patient has ADHD, there is a five-fold increase in risk to other family members
Physical	Early emerging alteration in cortical development leads to ADHD
	Neuro-imaging data shows changes in frontal-striatal-thalamic circuitry in patients with ADHD
	Brain injury caused by encephalitis leads to ADHD-like symptoms
	25 per cent of patients with traumatic brain injury have ADHD
	A patient with ADHD is more likely to have had brain injury at birth, premature birth or exposure to chemicals during pregnancy (e.g. alcohol, tobacco, heroin)
Family/environment	Disruptions to early care giving
	Certain styles of parenting
	Several studies suggest childhood environmental factors shape phenotypic expression of ADHD and co-morbidity with other behavioural disorders

- **Combined presentation** if enough symptoms of both inattention and hyperactivity-impulsivity criteria were present for the past six months
- **Predominantly inattentive presentation** if enough symptoms of inattention (but not hyperactivity-impulsivity) were present for the past six months
- **Predominantly hyperactive-impulsive presentation** if enough symptoms of hyperactivity-impulsivity (but not inattention) were present for the past six months.

Once ADHD is diagnosed, the level of severity will be ascertained from the degree of impairment caused. The condition can be classed as mild, moderate or severe.

Views of society and media portrayal

Although ADHD-like symptoms have been described for many years and the diagnosis has been recognised for over three decades, controversies around ADHD still remain.

To this day, many view ADHD as a label for a 'naughty child' or a failure in parenting. Media reports, particularly around the increased prescribing of stimulants or their use in enhancing performance, further add to this controversy. It is therefore not surprising that parents are often wary of accepting this diagnosis or there is disagreement between parents.

Management

Management of ADHD requires a holistic approach with involvement from a number of areas – medical, school, social and family.

It is useful to pause for a moment and think about how the patient may be feeling throughout this. The child would have been struggling in his/her domains (school work, friendships, relationships and emotionally) for many months, if not years. Typically, the child would have gone through months or years of being told off more than his/her peers. Children with ADHD may develop some sense that they are different, not as good as their peers and view themselves as 'naughty'. They will note that they do not tend to get invited to things like birthday parties, a friend's house or sleepovers.

Added to their experience are regular clinic reviews where they will have to listen to their parents and school reports describing negative behaviours and difficulties. It is unsurprising that this whole experience can lead to the patient feeling low, lacking in self-esteem, disengaged, resentful or even angry. It is therefore vital that the clinician engages with the patient at an age appropriate level and tries to understand his/her views at every opportunity.

It can be useful to ask the patient to reflect on their difficulties before and after treatment. This gives the patient as well as the clinician an understanding of the efficacy of the treatment approach and secures future engagement.

Table 4: DSM V diagnostic criteria for ADHD

Inattention	Six or more symptoms of inattention for children up to the age of 16 years, or five or more for adolescents 17 years and older and adults; symptoms of inattention have been present for at least six months and are inappropriate for developmental level
Hyperactivity and impulsivity	Six or more symptoms of hyperactivity-impulsivity for children up to the age of 16, or five or more for adolescents 17 years and older and adults; symptoms of hyperactivity-impulsivity have been present for at least six months to an extent that is disruptive and inappropriate for the person's developmental level
The following conditions must also be met:	· Several inattentive or hyperactive-impulsive symptoms were present before the age of 12 years · Several symptoms are present in two or more settings (such as at home, school or work; with friends or relatives; in other activities) · There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school or work functioning · The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder or personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder

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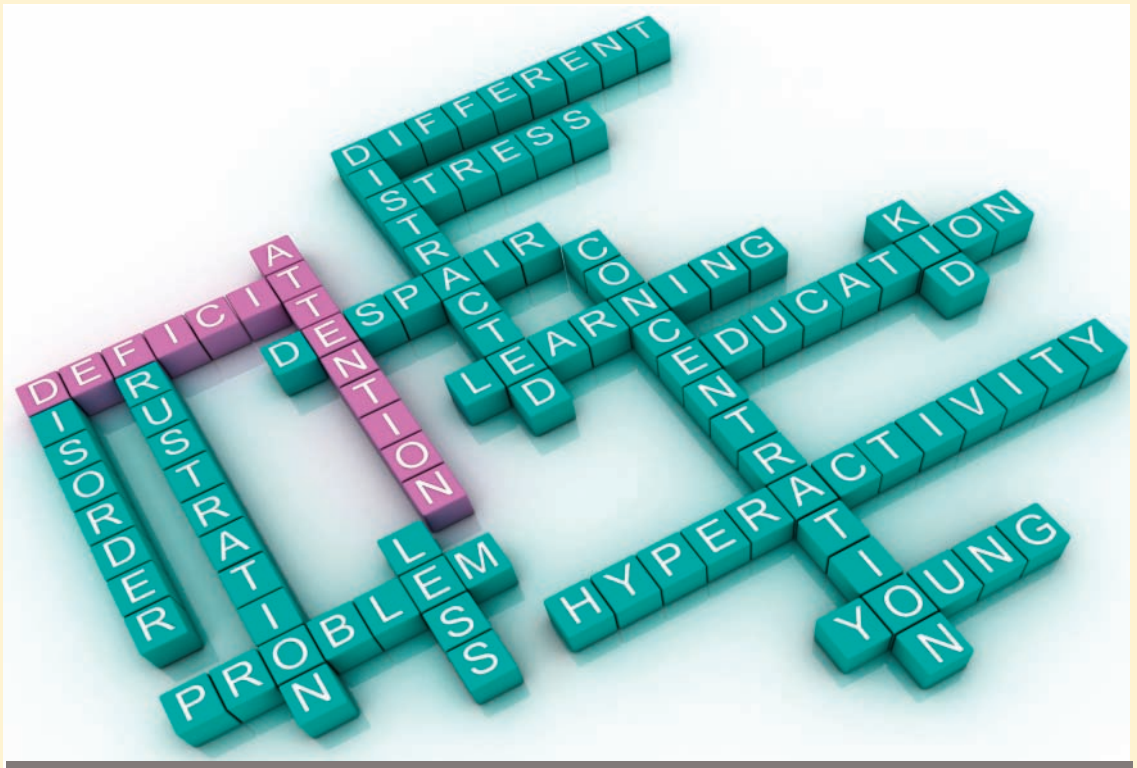

Prevalence of diagnosed ADHD in the UK is between 3-9 per cent

From the parents' point of view, there may be feelings of confusion or even guilt mediated by the associated stigma and preconceived views. It is important that clinicians explore parents' thoughts and feelings about the diagnosis and medicating their child. This allows misconceptions to be clarified and the parents to feel comfortable with the treatment plan.

Individual goals need to be set with the parents (and patient where possible). This, along with psycho-education, ensures that parents and patients have realistic expectations. The generic goals of treatment are to use a combination of drug and non-drug measures to ensure that the patient can thrive in all domains (academically, socially and emotionally) and enjoy a fulfilling childhood.

Behaviour management

NICE guidance recommends that a parent training/education programme is utilised, particularly in conjunction with medication. Younger children will not have reached the level of development required to regulate their own behaviour, so clinicians need to work with parents and others around them. As the child gets older and moves into adolescence, more work can be done directly with him/her to influence behaviour and emotions.

Behavioural interventions in ADHD have been used for over two decades. Evidence shows that behavioural parent training and behavioural modification in the classroom are regarded as well-established treatments. These interventions can also help manage other behaviours associated with co-morbidities such as conduct disorder. Typically, behavioural programmes help enhance core parenting skills such as:

- Parent-child relationship (e.g. spending time, showing affection)
- Encouraging desirable behaviours (e.g. use of praise, rewards)
- Teaching new skills and behaviours (e.g. setting a good example)
- Managing undesirable behaviour (e.g. ground rules, ignoring certain behaviour, consequences [punishment], time-outs).

Sleep

The amount of sleep needed reduces as a child gets older. In addition to tiredness, chronic lack of sleep can lead to lack of concentration, mood swings and irritability. Some of these symptoms may be misconstrued as ADHD or deterioration of ADHD. It is therefore vital that a patient with ADHD and their parents are supported to optimise sleep. Typically, a patient with ADHD struggles with sleep initiation (getting to sleep) but is often fine to sleep through the night once they fall asleep. The reason for this could be that their hyperactivity makes them unsettled. They will therefore struggle to sit or lay long enough to get to sleep. There are a number of strategies that can be used to help optimise sleeping (see Figure 2).

> **"He can now sit still and do his work. The school have described him as a different child"**

School

Patients spend a lot of time in school. It is an environment where they not only acquire academic skills but also social skills. Patients with ADHD will inevitably find the classroom environment difficult due to the expectation to sit still, not make noise, wait their turn and concentrate for a period of time.

Figure 2: Sleep hygiene advice for parents of ADHD patients

- Encourage activities outside. This allows the patient to expend excess energy and get tired. Exposure to fresh air and daylight helps maintain the sleep-wake cycle
- Relaxation techniques (such as focusing on breathing in, holding breath and breathing out, scents, music, dim lighting)
- Bedtime routine. This provides subtle cues to the brain that it is time to settle and go to sleep. A successful routine can include bath, story time and a light snack
- Sit with your child before bed to discuss their day and any worries they have. This can help reduce anxieties and likelihood of nightmares
- Ensure the bedroom is comfortable, quiet and sufficiently dark. Avoid using the room for other things, such as homework or a time-out area. This will ensure that the patient links the room only with sleep
- Do not have a TV in the room. Avoid all electronic devices an hour before bedtime
- Keep the weekday and weekend routine similar

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Equally, playtime or free time can be challenging as it is unstructured with fewer boundaries. Schools will utilise a variety of resources at their disposal to ensure that the patient has the best access to the curriculum. Strategies will include work that is differentiated to the patient's level, help from a teaching assistant in a mainstream classroom, small group work, one-to-one interventions and a condensed timetable.

Patients may get help from speech and language therapy, occupational therapy, school nurse and local teams that help them to better manage their emotions. Extra provision for exams can also be provided, such as using a computer, scriber and reader, and allowing extra time.

Transition from primary to secondary school can be a turbulent time for any child but particularly so for a patient with ADHD. Primary schools tend to be smaller, children are often taught in one to two classrooms and by a few teachers with whom they can build a good relationship. In contrast, secondary schools are bigger and there is a frequent need to move between lessons, become accustomed to many teachers and be organised. This can be problematic for patients with ADHD.

Medication used in ADHD

Medication is a valuable tool in the management of ADHD. NICE guidance recommends medication in patients with either severe or moderate impairment where non-drug measures have been ineffective or cannot be attempted. Medication must be used as part of a comprehensive treatment programme that will include all of the aforementioned supportive measures.

Commonly used ADHD medications are the stimulants, **methylphenidate** and **dexamfetamine**, and **atomoxetine** and **guanfacine** (both non-stimulants). Other medication such as **imipramine** and **bupropion** are also used off-label for the management of ADHD if the commonly used medications have been ineffective or not tolerated.

An area of concern for parents is the abuse potential and addiction of stimulant medication. Parents also worry about subsequent risk of other drug abuse. However, there is no evidence that ADHD medication is addictive or that taking stimulants will cause someone to try illicit drugs when they are older. In fact, taking medication can be protective as patients are less likely to then self-medicate.

Table 5: Summary of methylphenidate preparations

Name	Formulation	Strengths available	Release profile (quick:delayed action)	Approximate duration of action
Methylphenidate (e.g Ritalin, Tranquilyn)	Tablet (immediate release)	5mg, 10mg, 20mg	100% quick	3-4 hours
Equasym XL	Capsule (modified release)	10mg, 20mg, 30mg	30% quick: 70% delayed	8 hours
Medikinet XL	Capsule (modified release)	5mg, 10mg, 20mg, 30mg, 40mg, 50mg, 60mg	50% quick: 50% delayed	8 hours
Concerta XL	Tablet (modified release)	18mg, 27mg, 36mg, 54mg	22% quick: 78% delayed	12 hours
Xenidate XL	Tablet (modified release)	18mg, 27mg, 36mg, 54mg	22% quick: 78% delayed	12 hours
Matoride XL	Tablet (modified release)	18mg, 36mg, 54mg	22% quick: 78% delayed	12 hours

Methylphenidate is the most commonly used stimulant medication for the management of ADHD. With a response rate in clinical studies of between 70-85 per cent, methylphenidate is highly effective. It works by blocking the reuptake of dopamine (and possibly noradrenaline) into the nerve endings in the brain. The effects of methylphenidate are apparent very quickly (a matter of hours), but its full effect may take a few weeks.

The maximum licensed daily dose for Equasym XL and Medikinet XL is 60mg.

ADHD and driving

Adolescents with ADHD may be keen to drive a car when they reach the legal age to do so. Satisfactory control of ADHD symptoms is very important for such patients. Studies have shown that stimulant medication improves driving performance in patients with ADHD.

ADHD medications are centrally acting, so can impair judgement. They can also cause dizziness and affect vision. Adolescents should be counselled to only drive if they are unaffected by these symptoms.

> **"Our home is like a war zone"**

The maximum licensed daily dose for the 12-hour tablet preparations is 54mg. Some patients require a higher dose. Clinicians may exceed the licensed dose in some patients up to a total daily dose of 2.1mg/kg (maximum of 90mg per day of immediate release or equivalent dose of modified release). This would be off-label but is supported by NICE guidance.

The modified release tablet preparations must be swallowed whole. This may pose a problem for younger patients who find it difficult to swallow solid dosage forms. The capsule preparations may be swallowed whole but, for patients with swallowing difficulties, they can be opened and the contents emptied onto a small amount (tablespoon) of soft food, such as yogurt or apple sauce, and taken immediately. The patient must not chew it and it is good practice to drink some fluid afterwards to ensure the patient gets the full dose.

Due to differences in the release profile of the modified release medication, these capsule preparations must be prescribed by brand. The 12-hour tablet preparations are deemed to be bioequivalent but some patients and parents

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> **“When I am on medication I can think clearly and ride my bike carefully. Without medication, I will speed and take risks”**

notice a difference if they are switched between them, so these must also be prescribed by brand.

If a prescription for a modified release preparation is written generically, the pharmacy team must ascertain the patient's usual brand.

Where possible the patient should be maintained on a modified release preparation. The advantage is once daily administration, removing the need to have an afternoon dose in school, which can be problematic for school and patient alike.

Dexamfetamine, another stimulant medication used for ADHD, is indicated for refractory ADHD and therefore is reserved as a second-line treatment. It is an effective option in this regard since 80 per cent of patients who fail to respond to methylphenidate will respond to dexamfetamine.

The drug works by blocking the reuptake of dopamine and noradrenaline back into the nerve endings in the brain. It may also stimulate the release of these two neurotransmitters into the synapse. Dexamfetamine is available as a 5mg tablet.

Lisdexamfetamine (Elvanse) is a pharmacologically inactive prodrug. Following oral administration, lisdexamfetamine is rapidly absorbed from the gastrointestinal tract and hydrolysed primarily by red blood cells to dexamfetamine, the active drug.

Onset of action is one to two hours and duration of action is up to 13 hours. Elvanse is available as a 20mg, 30mg, 40mg, 50mg, 60mg and 70mg capsule. The capsule may be swallowed whole. For patients with swallowing difficulties (e.g. younger children), the capsule can be opened and contents emptied and mixed with a soft food, such as yogurt, or in a glass of water or orange juice and taken immediately.

The usual maximum daily dose of dexamfetamine is 20mg although some older patients have needed 40mg. The maximum daily dose of lisdexamfetamine is 70mg.

Atomoxetine (Strattera) is a non-stimulant medication for ADHD. It works by inhibiting the reuptake of noradrenaline. Advantages of atomoxetine are that it provides up to 24 hours' cover, has lower risk of worsening tics and less potential for drug abuse. The side-effect profile of atomoxetine may be more favourable compared to stimulants.

A major drawback of atomoxetine is that it takes about four weeks to start working and may take up to three months to have full effect. During the start of atomoxetine treatment, the clinician may decide to overlap with methylphenidate and then slowly withdraw the latter, but some patients may be on the combination treatment continuously. Combination treatment is off-label and the patient will need to be carefully monitored.

Atomoxetine is available as capsules in a variety of strengths: 10mg, 18mg, 25mg, 40mg, 60mg, 80mg and 100mg. It is also available as a 4mg/ml oral solution. For children and adolescents who weigh up to 70kg, the usual target daily dose is 1.2mg/kg (which is rounded to the nearest dosage form available). The safety of atomoxetine has been studied to 1.8mg/kg/day but evidence for efficacy above 1.2mg/kg/day is lacking. Atomoxetine should be given once daily in the morning. If tolerability or response is not satisfactory, the dose can be split, to be given in the morning and late afternoon or early evening.

Hyperactivity – one of the classic symptoms of ADHD

Medication breaks or 'holidays'

A medication break/holiday is a controversial area. Some clinicians will attempt this, while others will not entertain the idea. Some parents tend to medicate their child or adolescent every day of the year, while others choose to medicate only during school-time. Medication breaks/holidays can have advantages as well as drawbacks, so there should be a discussion with the parent and possibly the patient around this.

Guanfacine (Intuniv) is another non-stimulant medication for ADHD. It is a selective alpha-2a adrenergic receptor agonist. Like atomoxetine, guanfacine provides up to 24 hours' cover. A further advantage is that it works within three weeks. Available as a modified release tablet in strengths of 1mg, 2mg, 3mg and 4mg, guanfacine dosing is based on the patient's weight, with the maintenance dose ranging between 0.05-0.12mg/kg/day rounded up to the nearest dosage form available.

Melatonin is a hormone produced by the pineal gland, the production of which is suppressed by light and stimulated by darkness. It is thought to regulate the wake-sleep cycle. Melatonin may be prescribed in patients with ADHD if their insomnia is causing daytime impairment.

Evidence shows that melatonin does reduce sleep onset latency (time taken to go to sleep) by around 20 minutes and increases sleep duration by 15-20 minutes, but studies have failed to demonstrate how this has translated into better daytime ADHD symptom control, behaviour or quality of life. Melatonin is widely used in ADHD as it has more evidence compared to other sleep medicationss. It should, however, be used after careful consideration on a case-by-case basis.

Melatonin is available as a licensed product as a modified release 2mg tablet (Circadin). Its use in children and adolescents is off-label. Where

possible, clinicians will use the 2mg modified release tablet as this carries the least prescribing risk due to it being a licensed preparation. All other preparations are unlicensed. Tablets and capsules are available in a variety of strengths.

Melatonin also comes as an oral solution and suspension in varying strengths – some liquids are listed in part VIIIB of the Drug Tariff. Clinicians are encouraged to prescribe the preparations listed in part VIIIB to ensure competitive and consistent pricing. These will also be unlicensed preparations. Liquid preparations, tablets and capsules are utilised in some cases based on individual patient need. It is important that pharmacists procure any unlicensed medicines from sources that can assure good quality control measures. Typically, doses of between 2-10mg at night are utilised to help initiate or maintain sleep. Occasionally, higher doses of up to 14mg have been used.

Side-effects and monitoring ADHD treatment

There is considerable overlap of side-effect profiles and monitoring requirements between medications, so these will be considered together. Specific differences will be highlighted.

Overall, ADHD medications are well tolerated. Most of the side-effects occur during initiation and with dose increases, and subside after a week or two. It is therefore very important that these side-effects are explained to parents and patients and advice given on what to do if they occur, so they can persevere through them if possible.

Suicide-related behaviour was reported more frequently in patients taking atomoxetine (although still an uncommon occurrence). Parents and patients should be warned to look out for any worrying thoughts or behaviour and seek help as soon as possible. There have been some very rare reports of liver injury. Liver function tests are not routinely carried out before initiation of atomoxetine, but parents and patients should be counselled to look out for signs of potential liver injury (e.g. unexplained nausea, vomiting, abdominal pain, dark urine, yellow discoloration) and report any suspicious findings as soon as possible.

Guanfacine can also cause somnolence, sedation and fatigue, but these side-effects usually subside after a few weeks. Drinking plenty of fluids can help.

Table 6: Common side-effects of ADHD treatments and their management

Side-effect	What the patient/ parent may describe	Advice
Headache	Head is pounding or painful	If associated with initiation or dose increase, usually diminishes after a week or two. Try paracetamol
Anorexia	Weight loss, not eating, not feeling hungry	If associated with initiation or dose increase, usually diminishes over time. Anorexia is often associated with the length of action of the drug. Advise parents to encourage a good breakfast and evening meal (when medication levels are lower). Calorie supplementation such as full-fat milk, generous use of butter, double cream, pastry, milkshakes
Nausea, vomiting and abdominal pain	Feeling sick, being sick, abdominal pain	If associated with initiation or dose increase, usually diminishes after a week or two. Advise to persevere if possible. Taking medication after food may help
Nervousness	Feeling anxious, nervous, tearful	If associated with initiation or dose increase, usually diminishes after a week or two. Advise to persevere if possible
Insomnia	Can't get to sleep or getting to sleep later than before	Provide advice on sleep hygiene and relaxation techniques. If it continues, discuss with clinician
Aggression/ change in mood	Irritable, hostile, low mood, thoughts of self-harm	Could be related to medication. Ask parent/patient to speak to their secondary care clinician as soon as possible

While these are common side-effects associated with ADHD medication, if there is a suspicion of an underlying problem, refer parent to the GP or secondary care clinician

Parents are often concerned about the long-term effects on growth (weight and height), but ADHD medication should have a negligible effect. Growth may be slightly less than expected in some patients but weight and height should be monitored at least every six months so any changes can be picked up and acted upon.

Studies have shown that patients treated with ADHD medication are no more at risk of sudden death compared to the general population. A routine ECG is not required for starting ADHD medication unless physical examination or family history warrants further investigation. Stimulant and non-stimulant medication can increase blood pressure and heart rate (less likely with guanfacine).

Typically, the increase in blood pressure is around 1-4mmHg and increase in heart rate is less than 10bpm – but studies have shown increases in blood pressure of over 10mmHg. In 8-12 per cent of patients on atomoxetine, larger increases in blood pressure and pulse were noted. Again, these should be measured and blood pressure plotted on centile charts after initiation, dose increases and routinely every three months, according to NICE.

For stable patients, some areas may have an arrangement with primary care to do the three-month blood pressure measurement under shared care arrangements. Others may opt to measure blood pressure for their stable patients every six months, which is the recommendation from the manufacturers of methylphenidate and atomoxetine preparations.

Monitoring for guanfacine is slightly different as it can lower blood pressure and pulse rate. These parameters need to be monitored after initiation, at every dose increase and every three months for the first year of treatment.

Transition

Transition is an important part of a patient's care in this field. Cut-off for transition to adult services can vary across the country, but usually preparations tend to be made when the patient is around 16 years of age and adolescents then transition from around 18 years of age.

Before an adolescent is transitioned, it is important to explore their views, degree of impairment and future plans, and also trying a medication break if deemed clinically appropriate.

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ATTENTION DEFICIT HYPERACTIVITY DISORDER

assessment questions

1. Which best describes the core symptoms of ADHD?
a. Hyperactivity, agitation and insomnia
b. Hyperactivity, inattention and impulsivity
c. Impulsivity, anxiety and low mood
d. Hyperactivity and conduct disorder

2. What is the typical ratio of diagnosis between boys and girls?
a. 1 boy: 4 girls
b. Equal ratio of boys to girls
c. 4 boys: 1 girl
d. 3 boys: 1 girl

3. Which statement is correct regarding the co-morbidities with ADHD?
a. Patients usually do not have any co-morbidities
b. Fifty per cent of patients also have mood disorder
c. A patient will always have a sleep disorder
d. Co-morbidities are present in two-thirds of patients

4. What are the contributory factors to developing ADHD?
a. Poor parenting
b. Biological, physical and family/environmental
c. Having siblings and parents with ADHD
d. Diet/food additives

5. Which statement is TRUE about methylphenidate?
a. Is only available as a modified release tablet
b. Modified release preparations must be prescribed by brand
c. It is thought to work by blocking the re-uptake of noradrenaline
d. An ECG is needed before initiating treatment

6. Which of the following statements is TRUE about atomoxetine?
a. It takes about four weeks to start to work
b. The usual maintenance dose is 0.12mg/kg/day
c. It is a stimulant medication
d. It works for around 8 hours

7. Which statement is FALSE concerning guanfacine?
a. It is a non-stimulant medication
b. It provides up to 12 hours' cover
c. It is an alpha-2a adrenergic receptor agonist
d. It has an antihypertensive effect and is more likely to cause a reduction in blood pressure and pulse

8. Which statement is TRUE? Lisdexamfetamine:
a. It is a non-stimulant medication
b. Works for almost 24 hours
c. Can take several months to take full effect
d. Is a pro-drug that is hydrolysed primarily by red blood cells

Pharmacy Magazine CPD record

CPD September 2016

Use this form to record your learning and action points from this module on Attention deficit hyperactivity disorder or record on your personal learning log at pharmacymagazine.co.uk. You must be registered on the site to do this. Any training, learning or development activities that you undertake for CPD can also be recorded as evidence as part of your RPS Faculty practice-based portfolio when preparing for Faculty membership. So start your RPS Faculty journey today by accessing the portfolio and tools at rpharms.com/faculty.

Activity completed. (Describe what you did to increase your learning. Be specific)
(ACT)

Date: Time taken to complete activity:

What did I learn that was new in terms of developing my skills, knowledge and behaviours? Have my learning objectives been met?*
(EVALUATE)

How have I put this into practice? (Give an example of how you applied your learning). Why did it benefit my practice? (How did your learning affect outcomes?)
(EVALUATE)

Do I need to learn anything else in this area? (List your learning action points. How do you intend to meet these action points?)
(REFLECT & PLAN)

You can also record in your personal learning log at pharmacymagazine.co.uk

*** If as a result of completing your evaluation you have identified another new learning objective, start a new cycle. This will enable you to start at Reflect and then go on to Plan, Act and Evaluate. This form can be photocopied to avoid having to cut this page out of the module. You can also complete the module at pharmacymagazine.co.uk and record on your personal learning log**

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