



Clinical assessment and treatment of attention deficit hyperactivity disorder in adults

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Attention deficit hyperactivity disorder (ADHD) is a common childhood disorder that frequently persists into adulthood, with significant levels of inattentive, hyperactive and impulsive behavior. Impairments associated with adult ADHD include distress from the symptoms, impaired ability to function in work and academic settings, and problems sustaining stable relationships. The disorder is commonly associated with volatile moods, antisocial behavior, and drug and alcohol misuse. There is an increased risk of developing comorbid anxiety, depression, personality disorders, and drug and alcohol dependence. Despite the proven effectiveness of drugs such as methylphenidate, dexamphetamine and atomoxetine, few cases of ADHD are recognized and treated in the UK. The reasons for this are unclear, since most psychiatrists working with children and adolescents are aware that ADHD commonly persists into adult life and they also see the disorder affecting parents of children with ADHD. Issues of transition from the care of child to adult psychiatry and the need to refer adult relatives of children with ADHD to suitable psychiatric services are a major concern. Furthermore, many cases of adult ADHD go unrecognized or are seen by mental health teams that are not familiar with the subtleties of the adult presentation. As a result, misdiagnosis and treatment for conditions such as atypical depression, mixed affective disorder, cyclothymia, and borderline and unstable emotional personality disorders is not uncommon. There is therefore a requirement for further training in this area. This review will describe the common clinical presentation and provide guidelines for the diagnosis and treatment of ADHD in adults. Any psychiatrically trained physician using standard psychiatric assessment procedures can perform clinical evaluations for adult ADHD. As with other psychiatric disorders in adulthood, ADHD has its own characteristic onset, course and psychopathology. Symptoms of ADHD are trait-like, being stable characteristics from early childhood, and commonly co-occur with affective instability. Stimulants are the mainstay of treatment and are effective in around 70% of cases. Psychotherapeutic interventions also have an important role. These guidelines will assist psychiatrists and other adult mental health workers in identifying and treating individuals with adult ADHD.

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Attention deficit hyperactivity disorder (ADHD) is a common, highly heritable neurodevelopmental disorder that affects approximately 3–4% of children and 1% of adults [1]. The disorder starts in early childhood and is characterized by pervasive inattention, hyperactivity and impulsivity that is inappropriate to the developmental stage. Symptoms of the disorder are known to persist into adult life in the majority of cases, either as

the operationally defined disorder or persistence of some symptoms associated with significant levels of academic, occupational and social impairment [2]. The trait-like characteristic of ADHD symptoms that start early in life and have a chronic persistent course, and the frequency of symptoms such as mood instability alongside core ADHD symptoms, can lead to mis-specification of the diagnosis, either as personality or minor affective disorders.

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ADHD in adults does, however, have a highly characteristic psychopathology that includes mood instability, initial insomnia, ceaseless unfocused thought processes, forgetfulness, distractibility, inner restlessness, procrastination, disorganization, impatience and avoidance behaviors. The disorder is associated with a high risk for comorbid psychiatric disorders including alcohol and drug abuse, antisocial behavior, anxiety, depression, and general and specific learning difficulties [3–6]. Clinical and research evidence defines the characteristics of a significant psychiatric disorder that responds remarkably well to treatment with stimulants in most cases [2,7]. Recognition and appropriate treatment of ADHD in all age groups is therefore of considerable importance.

Although ADHD is well recognized in child and adolescent psychiatry, general adult psychiatry has yet to recognize the impact that persistence of ADHD symptoms has on adult psychopathology. Earlier reports that ADHD is a self-limiting condition that rarely requires treatment in adult life [8] have not been supported by more recent evidence [9–11]. Meta-analysis of available data finds that approximately 33% of children with ADHD retain the full diagnosis as adults, whereas 66% show partial diagnosis with persistence of some symptoms linked to impairment. This suggests a prevalence of approximately 1% for ADHD in adults, a figure that is similar to that observed in population prevalence surveys. Furthermore, child and adolescent psychiatrists see many children with ADHD who have continued difficulties as they grow older and are aware of the need for continued treatment with stimulants during the transition from child to adult services. They are also aware of the high level of clinically significant ADHD symptoms among many parents of their child patients. Data on familial risks suggest a rate of ADHD of approximately 20% among parents of ADHD probands [12].

Awareness of the condition in adults can lead to fruitful clinical interventions. Double-blind, placebo-controlled trials show that the clinical effects of stimulant drugs in the short-term reduction of ADHD symptoms are similar in adults to that established in children [13]. The missing piece of hard evidence is whether the reduction of symptoms in this way also promotes better social adjustment in the medium- to long term. However, clinical experience shows an improvement in relationships, social functioning, adjustment in work conditions, abstinence from drugs and alcohol, and driving performance. Drug treatment for ADHD should therefore be a normal part of the therapeutic resources available within general adult psychiatry. Training of general psychiatrists in the clinical evaluation and management of ADHD is therefore a high priority.

Diagnostic criteria for adult attention deficit hyperactivity disorder *Symptoms checklist*

The Diagnostic and Statistical Manual of Mental Disorders IV, Text Revision (DSM-IV-TR) criteria defined by the American Psychiatric Association [14] are the most widely used and include the three subtypes of ADHD: the inattentive (I), the hyperactive/impulsive (H/I) and the combined (CT). Many

clinicians consider that inattention is the key feature of ADHD and it is notable that most children who receive an ADHD diagnosis in UK clinics have either the CT or I subtypes, but rarely the H/I subtype. This is in keeping with experience from adult ADHD clinics, but contrasts with nonclinical populations where surveys of adult populations find a high rate of the H/I subtype, suggesting that individuals with the H/I subtype are rarely identified. Evidence from family and twin studies suggest that, whereas the CT and I subtypes share familial risks, this is not the case for the H/I subtype [15].

The hyperkinetic disorder criterion of the World Health Organization [16] defines a subgroup of the DSM-IV category that represents a more restricted application of the diagnostic criteria. However, most clinicians prefer to follow the broader DSM-IV criteria that allow for the coexistence of comorbid psychiatric disorders and fits more closely with clinical practice. Under both sets of criteria there are no special definitions for ADHD in adults. The same list of 18 core items is listed under both; nine describing inattentive behaviors and nine describing hyperactive and impulsive behaviors. DSM-IV requires six out of the nine inattentive behaviors for the I subtype, six out of nine hyperactive/impulsive behaviors for the H/I subtype and six in each of the two domains for the combined subtype. DSM-IV also allows the category of 'ADHD in partial remission' for individuals who no longer meet the full criteria. This is an important recognition that many individuals who fulfilled operational criteria for ADHD as children no longer have a sufficient number of ADHD symptoms to reach full criteria for ADHD as adults, even though persistence of some symptoms continues to cause significant clinical impairments.

Strict usage of the full diagnostic criteria in adults will lead to underidentification of individuals who would benefit from treatment for ADHD [9]. One solution is to apply the full diagnostic thresholds for retrospective diagnosis of ADHD in childhood, but developmentally referenced (lower) thresholds in adults. Another approach is to provide age-appropriate adjustment of the symptom checklist. The current DSM-IV criteria were designed for evaluation by parent and teacher observer reports, rather than the more common use of self-reports in adults. The emphasis has been less on psychopathology than on descriptions of observed behaviors. As a consequence, the descriptions in DSM-IV are not always easy to apply to adults. In adults, problems with inattention tend to be particularly disabling since organizational demands increase, impulsivity changes quality and has different consequences in adults, and the aimless hyperactivity of childhood may become more purposeful (i.e., sporting activities and work that allows for restless behavior) or may present as feelings of inner restlessness. More detailed descriptions of ADHD symptoms are provided in BOXES 1–4.

Age of onset

The DSM-IV age of onset criterion ('some symptoms should be met before the age of 7 years') may sometimes be difficult to evaluate retrospectively. Nevertheless, establishing the early age of onset of some symptoms is critical to establishing the

Box 1. Guidelines for current attention deficit hyperactivity disorder symptoms in adults.

Overview:

- The aim of this guide is to provide a comprehensive list of the 18 items that are required to make a diagnosis of attention deficit hyperactivity disorder (ADHD) according to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV. These items are the same as those listed in the International Classification of Diseases (ICD)-10; however, ICD-10 insists that every item must be present in more than one environment (e.g., home and school or work). Under DSM-IV, some of the symptoms must be present in two or more settings, but there is no requirement that each item must fulfil the criteria of pervasiveness. Symptoms must be maladaptive and inconsistent with developmental level. Overall, there must be clear evidence of clinically significant impairment in social, academic or occupational functioning
- In adults, there should be two parts to the diagnostic interview. The 18-item list is the same for each, but the symptoms are likely to be reflected in different types of behaviors at the different ages (i) childhood mental state and behaviors (off medication), and (ii) current mental state and behaviors (off medication)

Age of onset in early childhood:

- It is critical that a good account is taken of childhood psychopathology. A diagnosis of ADHD can only be made with an onset of some symptoms prior to the age of 7 years. Due to the problems with obtaining reliable retrospective accounts from such an early age, it is usually acceptable to use less stringent criteria of onset by the age of 12 years when making the diagnosis in adults
- In addition to taking a history from the individual being assessed, it is usual to enquire after childhood symptoms and behavior from one or both parents. If this is not possible, a (elder) sibling may be able to give an accurate account. Problems at school may be established from individual and informant accounts and verified from school records. It is often useful to interview the informant with the proband to obtain a consensus account of childhood symptoms. In case of disagreement between informants, the most reliable informant(s) should be followed

Symptoms are not better accounted for by another disorder:

- They should not occur exclusively during the course of pervasive developmental disorder (autism and Asperger's), schizophrenia or other psychotic, mood, anxiety, dissociative or personality disorders

Some impairment from the symptoms is present in two or more settings:

- Impairment must be observed at home as well as in other settings such as school or work

Clear evidence of clinically significant impairment in social, academic or occupational function:

- The criteria of clinically significant impairment is important and can affect many different aspects of an individual's life. Guidelines for impairment are given in BOX 4

diagnosis and, whenever possible, sufficient retrospective data should be gathered to be confident of the childhood onset. The current age criterion may, however, be too restricted for clinical practice since ADHD symptoms that begin in early childhood do not always give rise to significant impairments until early adolescence or occasionally early adulthood. This is especially true for inattentive symptoms, which may go unnoticed in early childhood but become more evident under the increasing demands of secondary school education, further education and employment. Another consideration is that individuals providing a self-report of their own childhood behaviors are rarely able to give an accurate account before the age of around 10–12 years. Moreover, follow-up studies among children with an age of onset before and after the age of 7 years showed no differences in severity of symptoms, treatment outcome or prognosis [17,18]. For these reasons it has been suggested that a broader criteria of some symptoms being met before the age of 12 years be used when the diagnosis is evaluated for the first time in adulthood, especially where other characteristic features of the disorder are present.

Persistence of symptoms

This is a key feature to look for when evaluating ADHD symptoms in adults. Current ADHD symptoms should have been present throughout life and appear to be behavioral or

symptomatic traits rather than symptoms of a treatable disorder. ADHD symptoms usually start in early childhood, are chronic, do not fluctuate over time and are not associated with a change in mental state from a normal premorbid personality. Most individuals will describe their symptoms as always being present and typically state that this is the way that they have always been. A good question is to ask them when the symptoms first started or if they can recall a time when the symptoms were not present.

Symptoms are maladaptive to developmental stage

Follow-up studies show that although ADHD symptoms modify with increasing age, the relative differences between cases and controls remain and are associated with significant functional impairments. Typically, overt hyperactive and impulsive symptoms modify more than attentional symptoms and it is therefore important to make appropriate age adjustments to the ADHD symptoms.

Impairment in two or more settings

ADHD symptoms are not specific to any particular situation and impairments are therefore observed in multiple domains. Impairments are typically prominent at home (inability to pay bills, disorganization, difficulty sustaining personal

Box 2. Attention deficit hyperactivity disorder symptom checklist.

Inattention:

- Often fails to give close attention to detail: difficulty remembering where they put things. In work this may lead to costly errors. Tasks that require detail and are tedious (e.g., income tax returns) become very stressful. This may include overly perfectionistic and rigid behavior, needing too much time for tasks involving details in order to prevent forgetting any of them
- Often has difficulty sustaining attention: inability to complete tasks such as tidying a room or mowing the lawn without forgetting the objective and starting something else. Inability to persist with boring jobs. Inability to sustain sufficient attention to read a book that is not of special interest, although there is no reading disorder. Inability to keep accounts, write letters or pay bills. Attention, however, can often be sustained during exciting, new or interesting activities (e.g., using the internet, chatting and computer games). This does not exclude the criterion when boring activities are not completed
- Often does not appear to listen when spoken to: adults receive complaints that they do not listen, and that it is difficult to gain their attention. Even where they appear to have heard, they forget what was said and follow through. These complaints reflect a sense that they are 'not always in the room', 'not all there' or 'not tuned in'
- Fails to follow through on instructions and complete tasks: adults may observe difficulty in following other people's instructions. Inability to read or follow instructions in a manual for appliances. Failure to keep commitments undertaken (e.g., work around the house)
- Difficulty organizing tasks or activities: adults note recurrent errors (e.g., lateness, missed appointments or missing critical deadlines). Sometimes a deficit in this area is seen in the amount of delegation to others such as secretary at work or spouse at home
- Avoids or dislikes sustained mental effort: putting off tasks such as responding to letters, completing tax returns, organizing old papers, paying bills or establishing a will. One can enquire about specifics then ask why particular tasks were not attended to. These adults often complain of procrastination
- Often loses things needed for tasks: misplacing purse, wallet, keys and assignments from work, where car is parked, tools and even children!
- Easily distracted by extraneous stimuli: subjectively experience distractibility and describe ways in which they try to overcome this. This may include listening to white noise, multitasking, requiring absolute quiet or creating an emergency to achieve adequate states of arousal to complete tasks, many projects going simultaneously and trouble with completion of tasks
- Forgetful in daily activities: may complain of memory problems. They head out to the supermarket with a list of things, but end up coming home having failed to complete their tasks or having purchased something else

Hyperactivity:

- Fidgets with hands or feet: this item may be observed, but it is also useful to ask about this. Fidgeting may include picking their fingers, shaking their knees, tapping their hands or feet and changing position. Fidgeting is most likely to be observed while waiting in the waiting area of the clinic
- Leaves seat in situations in which remaining seated is usual: adults may be restless. For example, they experience frustration with dinners out in restaurants and are unable to sit during conversations, meetings and conferences. This may also manifest as a strong internal feeling of restlessness when waiting
- Wanders or runs about excessively or frequently experiences subjective feelings of restlessness: adults may describe their subjective sense of always needing to be 'on the go', or feeling more comfortable with stimulating activities (e.g., skiing) than with more sedentary types of recreation. They may pace during the interview
- Difficulty engaging in leisure activities quietly: adults may describe an unwillingness/dislike to ever just stay home or engage in quiet activities. They may complain that they are workaholics, in which case detailed examples should be given
- Often 'on the go' or acts as if driven by a motor: significant others may have a sense of the exhausting and frenetic pace of these adults. Attention deficit hyperactivity disorder adults will often appear to expect the same frenetic pace of others. Holidays may be described as draining since there is no opportunity for rest
- Talks excessively: excessive talking makes dialog difficult. This may interfere with a spouse's sense of 'being heard' or achieving intimacy. This chatter may be experienced as nagging and may interfere with normal social interactions. Clowning, repartee or other means of dominating conversations may mask an inability to engage in give-and-take conversation

Impulsivity:

- Blurts out answers before questions have been completed: this will usually be observed during the interview. This may also be experienced by probands as a subjective sense of other people talking too slowly and of finding it difficult to wait for them to finish. Tendency to say what comes to mind without considering timing or appropriateness
 - Difficulty waiting in turn: adults find it difficult to wait for others to finish tasks at their own pace, such as children. They may feel irritated waiting in line at bank machines or in a restaurant. They may be aware of their own intense efforts to force themselves to wait. Some adults compensate for this by carrying something to do at all times
 - Interrupts or intrudes on others: most often experienced by adults as social ineptness at social gatherings or even with close friends. An example might be the inability to watch others struggle with a task (e.g., opening a door with a key) without jumping in to try for themselves
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relationships, frustration and irritability), at work (inability to focus on tasks, inconsistent performance, difficulty following instructions, time-keeping and disorganization) and when going out (time-keeping, frustration when having to wait for any reason, listening to others, driving accidents and ability to relax).

Attention deficit hyperactivity disorder symptoms not better explained by another disorder

ADHD symptoms should not occur solely within the context of another psychiatric disorder such as schizophrenia, or mood, substance abuse or pervasive developmental disorders. However, it is important to recognize that ADHD is frequently accompanied by comorbid syndromes and disorders, especially anxiety, mood, substance use and personality disorders. Comorbidity is the rule in some clinical series, with up to 75% having at least one other comorbid disorder or syndrome, and 33% having two or more other disorders or syndromes. It is, however, important to distinguish between co-occurring Axis I disorders that may require their own targeted treatment, rather than symptoms of ADHD that overlap with other common psychiatric disorders such as mood instability and behavioral traits that may be explained by the persistence of ADHD symptoms. For this reason, differential diagnosis is an important part of the diagnostic process and has consequences for the order and choice of treatments.

Assessment process

Diagnosis is based on a careful and systematic assessment of the developmental psychiatric history in addition to the current mental state examination and adult psychiatric history. Although rating scale and neuropsychologic measures are frequently used in specialist ADHD clinics, these are not sufficiently good predictors to ensure a correct clinical diagnosis. As with other psychiatric disorders, ADHD is a clinical and behavioral phenotype best evaluated by clinical diagnostic interview of the individual with supporting evidence from informants.

A major issue faced by clinicians is to decide at what level of severity the behaviors and symptoms of ADHD become significant. This is important since the symptoms occur to a varying degree in most people and there is no natural clinical threshold. In this sense, ADHD is no different from other common psychiatric disorders, such as anxiety and depression, that also commonly occur in most people. In clinical practice, reasonable thresholds need to be applied on the basis of the level of severity, personal distress to self and others, and levels of impairment associated with the symptoms.

To get a complete overview of lifetime medical history it is important to enquire about psychiatric symptoms occurring throughout the lifespan and previous treatments for psychiatric and medical conditions. Establishing an accurate record of early adult and childhood symptoms using retrospective accounts remains controversial, although the task of collecting accurate accounts of past behavior is in fact central to understanding many psychiatric disorders. This is therefore a process that all general adult psychiatrists should be familiar with. A judgment will have to be formed on the reliability of the

account provided and whether the patient has good insight into the symptoms and behaviors at each time-point. Diagnosis based upon the single use of self-report alone is not impossible, but in most cases provides less certainty than using the combination of self- and observer reports.

The use of information from multiple informants is underscored by follow-up data in adolescents with ADHD. It has been shown that higher persistence rates of ADHD are recorded using parent reports than using self-report, with parent reports being more strongly associated with clinical impairments [19]. This reflects a substantial risk of underdiagnosis, rather than the more commonly assumed problem of overdiagnosis, using self-report alone. On the other hand, epidemiologic studies using rating scales show that the core symptoms of ADHD are often recognized in the absence of significant impairment, suggesting that, in a proportion of cases, self-report may lead to overdiagnosis. Despite these concerns over the accuracy of self-report for ADHD symptoms, the usual clinical experience is similar to that for other nonpsychotic psychiatric conditions; that in most cases both the individual with ADHD and the informant agree on the major items. As with psychiatric assessments of other common conditions, informant report is helpful to corroborate the account, provide more detailed objective observations of behavior and find out more on the impact of the behaviors on interactions with close relatives, friends and work colleagues.

Diagnostic instruments

There are several screening instruments and diagnostic interviews available to use during the assessment process. However, the main task is to take a careful developmental and psychiatric history and mental state. It should not be expected that individuals with ADHD would necessarily display objective signs of the disorder during the assessment session. ADHD symptoms are often suppressed in situations that individuals find highly motivating. This is certainly the case for most clinic appointments when patients typically have a high level of interest in the assessment process and its outcome. The focus of the mental state examination should therefore be on behavior and performance during the previous week. Questions should be asked about the level of function and more specifically about presence or absence of typical ADHD symptoms during the last week in a variety of situations at home, work or college, and in social situations. To guide the assessment process or for research purposes, diagnostic interviews are available that systematically enquire about the major symptoms. These include the Brown ADD Scale (BADDs) Diagnostic Form [20], the Conners Adult ADHD Diagnostic Interview for DSM-IV [21] and the structured Diagnostic Interview Schedule (DIS)-L (part of the DIS-IV) [22].

Rating scale measures can be useful as screening instruments or to follow the progress of treatment response as change from baseline levels. The most widely used rating scales for current symptoms are based upon the DSM-IV criteria and include the Barkley adult ADHD rating scale [23], the Conners Adult ADHD rating

Box 3. Symptoms associated with adult attention deficit hyperactivity disorder.

Some symptoms are not a requirement for a Diagnostic and Statistical Manual of Mental Disorders-IV diagnosis of attention deficit hyperactivity disorder but are commonly associated with the disorder and should therefore be looked for:

- Procrastination: observed when assignments are not begun until the day they are due. In adult life, procrastination causes potentially serious consequences, such as not paying bills, not completing income tax forms and not answering letters – all of which make life difficult both for the individual and their spouse
- Low tolerance of frustration: this is related to impulsivity and is often described as being on a 'short fuse'. Relatively minor frustrations cause catastrophic reactions that may manifest as actual loss of temper or by getting in an angry mood. It may occur at home or work and interferes with relationships in either setting
- Mood lability: this is very commonly observed in as many as 90% of cases. The characteristic mood is highly volatile from one part of the day to the next, changing around four- to five-times a day. Mood changes are not necessarily in response to external events, although they may be. The mood is up and down, often for an hour or a few hours. It has been described as like a roller coaster. Unlike the mood changes observed in uni- or bipolar affective disorders, the mood swings are not so extreme, do not last for days or weeks at a time and do not fit into an episodic or cyclical pattern
- Low self-esteem: diminished self-esteem is very common. It is expected given the lifelong problems with rejections and failures that occur more frequently than would be expected given their individual potential. Problems of low self-esteem that start in childhood are often enduring (e.g., following academic failure). Adults often describe feeling 'stupid and different' at some time in their life. Even successful individuals feel as if they are a fraud or a nuisance to those around them and they frequently complain that they are unable to perform at the level that they expect of themselves. Low self-esteem is often pervasive since it started so early in life

Other common associated symptoms include:

- Underachievement associated with a sense of failure
- Frequent search for high stimulation
- Intolerance of boredom
- Hyperfocusing
- Trouble going through proper procedures due to boredom and frustration
- Tendency to worry needlessly (worry becomes what attention turns into when it is not focused)
- Sense of insecurity
- Inaccurate self-observation and -assessment of their impact on others

scale [24], and the World Health Organization Adult ADHD Self-Report Scale (ASRS) [25]. The BADDSS is frequently used in clinics in the USA and consists of a broader range of inattention symptoms and organizational difficulties, including several items related to emotional regulation [20]. For the retrospective diagnosis of ADHD in childhood, a commonly used screening instrument is the Wender Utah Rating Scale [26]. The Barkley and Conner scales also include checklists that may be used retrospectively to obtain information on childhood symptoms. In addition to self-ratings, ratings from informants are frequently used; typically from parents for ratings of early childhood behavior and partners or close relatives for current behavior.

There are currently no direct biologic tests with sufficient positive and negative predictive value for reliable use in the clinical setting. Structural imaging and functional imaging patterns, direct measurement of striatal dopamine transporter density using single photon emission computed tomography scan, and performance on various neuropsychologic tests are all associated with ADHD in case-control comparisons [27–30]. On an individual level, patients may be sufficiently aroused by the novelty of test situations to perform well, while other individuals will show deficits on tests of attention, executive function, timing tasks and response inhibition. An extensive research literature demonstrates that individuals with ADHD may not have core deficits of

attention or response inhibition (in the sense that individuals have different intelligence quotient levels), since task performance under fast or rewarded conditions is associated with normalization of performance [28]. There is now increasing evidence that intra-individual variability in performance across a variety of neuropsychologic tests discriminates ADHD cases from controls better than mean difference in performance on tasks designed to measure specific aspects of cognitive processing [KLEIN C, WENDLING K, HUETTNER P, PEPPER M. SUBMITTED].

Evaluation of clinical features

Central to the assessment of ADHD is the evaluation of each of the 18 core items that define the disorder. These are listed in BOXES 1–4, with age-adjusted descriptions of how the symptoms may present in adulthood. However, there are additional symptoms and characteristic features of adult ADHD that are not outlined in standard descriptions of ADHD.

Mood symptoms

Problems with mood lability, emotional over-reactivity and temper outburst are very commonly observed, in up to 90% of patients in one clinical series [6], and in some cases are the main presenting complaint. Mood instability often appears to be part of the ADHD syndrome when there is an early age of onset, occurrence across the lifespan in association with core ADHD

symptoms and a nonepisodic course. Clinical experience shows that mood instability often responds to stimulant medication in the same time course as the main ADHD symptoms and should therefore be regarded as part of the ADHD condition and not always as a separate mood disorder. Careful evaluation will need to be made of any affective symptoms that occur to differentiate these from the more typical onset of anxiety, depressive or bipolar disorders.

Thought processes

A common account from individuals with ADHD is of having a 'distractible mind' or a mind that is 'in a fog'. Individuals report the experience of ceaseless mental activity, thoughts that are constantly on the go or a mind that is constantly full of thoughts. Thought processes are often experienced as uncontrolled in the sense that multiple thoughts occur at the same time, one overlapping the other and distracting each other. Another common description is of short-lived thoughts that flit from one thing to another or jump around between different ideas. In a few rare extreme cases, such thought processes may be confused with the speeding of thoughts and flight of ideas observed in bipolar disorder. However, individuals with ADHD do not describe their thoughts as clear or focused, they do not have typical flight of ideas and the thought content is not grandiose. They do not perceive their thoughts as running faster than usual, but rather that they are uncontrolled, constant and unfocused. As with the other features of ADHD, such descriptions of thought processes are not periodic, but are recalled as starting in childhood and are persistent and non-fluctuating. They are often described as exhausting, not allowing the individual to relax or have a quiet mind and may give rise to initial insomnia. Another feature of this symptom is the sensitivity to stimulant medication with

control only during the active phase of the drug response. Ceaseless or uncontrolled mental activity may sometimes mimic anxious worrying or rarely obsessional thoughts.

Slow & variable performance

Although the term attention deficit suggests a core deficit in attentional processing, clinical and research evidence does not strongly support this view [KLEIN C, WENDLING K, HUETTNER P, PEPER M. SUBMITTED, 27,28]. A more characteristic feature of ADHD is the inability to sustain levels of interest and performance for tasks that are slow or do not have a high degree of salience for the individual. Clinically, a highly variable level of performance is typical, so that someone with ADHD may perform very well at one or two tasks they are particularly interested in, while many other functions are neglected, avoided or performed inadequately. For example, a person with ADHD may spend hours at a computer terminal reading and responding to e-mails and opening multiple websites or may be very focused during sporting activities, while failing to pay the house bills, organize shopping, focus on conversations, get to work on time, work at a normal pace or provide a reliable level of performance at work and suffer temper outbursts. This type of variable performance can lead observers to feel that the person is not trying hard enough, or is being lazy or has a problem of will. However, this view fails to understand that one of the core impairments in ADHD is the ability to sustain attention and allocate normal levels of energy on tasks that are not highly salient (i.e., fast, rapidly changing and rewarding tasks). While this is true for everyone to some extent, the inability to allocate sufficient mental effort to tasks can be extreme and disabling in ADHD. As with other core symptoms of ADHD, these types of difficulties with motivation or state regulation are in most cases highly responsive to stimulants.

Box 4. Assessment of impairment.

Impairment is a requirement for a diagnosis of attention deficit hyperactivity disorder (ADHD). The clinician needs to assess whether an individual is impaired relative to his or her own potential, or relative to expected norms. Some very bright individuals are not impaired relative to expected norms, but reveal unequivocal impairment relative to their own potential. It is important to enquire into different areas of life since someone with ADHD may be brilliant at some sorts of work while feeling totally inadequate because of their inability to be organized or do work around the house

- Quality of life: mood lability, a short fuse and constant efforts to correct scatterbrained mistakes are frustrating and demoralizing
- Family life: even where an adult with ADHD feels fine, interviewing of the patient's spouse/family may reveal significant dysfunction
- Work: while some ADHD individuals find work that is compatible with their symptoms, they may be impaired by not being able to move in new directions in which they would otherwise have desired to move. Others may be functioning in attention-demanding professions, but at great emotional cost and without much success. Work may not be commensurate with their intelligence and educational background. This is usually experienced as underachievement
- Love: ADHD is hard on relationships and some adults with ADHD give up on their capacity for intimacy and lead an isolated existence. They may be unaware of the ways in which their ADHD-caused behavior patterns have contributed to relationship failures.
- Education: many adults with ADHD are impeded from obtaining an education appropriate to their potential (usually assessed by IQ). A history of academic underachievement or erratic performance represents academic impairment
- Activities of daily life (ADL): even a high-functioning individual with ADHD may have difficulties with ADL, such as shopping, cleaning, dressing or managing money. The deficit is not observed in what the individual can do, but in what they actually do – so direct observation or an informant is required to assess this correctly

Treatment

Impact of diagnosis & treatment

As ADHD is a developmental disorder persisting across the lifespan, the impact of the disorder on adults can be considerable. Many adults with ADHD report a life full of problems and frustrations that stem directly from attention deficits, impulsive and overactive behavior, and mood lability. Others often perceive behaviors related to ADHD as the result of being lazy, stupid or just difficult. Individuals with ADHD often say they have always known that they were different from other people their own age, but never knew what was wrong. As a result, the diagnosis of ADHD is often received with considerable relief since it provides an explanation for lifetime problems and the potential for effective treatment where significant symptoms persist. This initial relief is sometimes followed by feelings of anger; 'why didn't I receive this diagnosis earlier on', 'I could have finished my education', or 'maybe my relationship/marriage wouldn't have failed'. Diagnosis alone often has a great impact, as finally an overview and understanding of lifetime patterns of behavioral problems is achieved. Many individuals need time to accept the diagnosis and its consequences. Finally, if treatment is successful, new opportunities arise, and many patients need to learn new skills to cope with them.

ADHD symptoms can be treated effectively in adults as well as in children. Numerous studies have shown the beneficial effects of stimulant medication on the core symptoms of ADHD in children [31]. The number of drug trials in adults is far less than that for childhood ADHD but these consistently demonstrate similar response rates [13]. Due to the demands and responsibilities of adult life and the ability of many adults to develop strategies to cope with ADHD symptoms, a range of targeted psychosocial and psychological treatments are likely to be beneficial; however, there have been few attempts to quantify the benefits of such interventions. Treatment offers hope of a better life by reducing the level of ADHD symptoms that give rise to psychosocial impairments and enabling individuals to overcome dysfunctional patterns of behavior. Areas of improvement include:

- Levels of distress from ADHD symptoms
- Psychologic functioning and increased self-confidence
- Family/relational functioning
- Interpersonal (broader than family) functioning
- Professional/academic functioning
- Driving performance
- Risk of alcohol and substance abuse (including smoking)

Optimal treatment algorithm

Treatment always starts with careful diagnostic assessment of ADHD, accompanying symptoms and behaviors, and comorbid disorders. Comorbidity is common, with many individuals with adult ADHD having one or more associated psychiatric syndromes. However, care must be taken to differentiate associated symptoms of ADHD such as mood lability, irritability and

low self-esteem from distinct (comorbid) psychiatric disorders. Differential diagnostic considerations are an important part of the diagnostic process and have consequences for treatment and its order. As for most other psychiatric conditions, treatment should take a multimodal approach including psychoeducation, pharmacotherapy and psychotherapeutic interventions such as coaching, cognitive behavioral therapy (CBT) and counseling.

Pharmaceutical treatments

Stimulants

Stimulants are the first-choice treatments for ADHD in both children and adults. In the UK, both methylphenidate (Ritalin[®], Equasym[®], Concerta[®]) and dexamphetamine (Dexedrine[®]) are available, although at the time of writing they remain unlicensed for use in adults. The evidence base for the effectiveness and safety of stimulants in children is considerable, and there is now an increasing amount of data concerning efficacy in adults [13,32,33]. A recent meta-analysis of well-conducted drug trials of methylphenidate found the same treatment effect size to that observed in multiple studies of children [13]. The meta-analysis suggested that adequate dosage regimens were important to maximize drug response rates and this has been shown to be the case in recent studies of methylphenidate [33,34]. The effects of stimulants on ADHD symptoms are different from many other psychiatric treatments, as there is an immediate effect similar to the rapid-onset sedative and anxiolytic effects of benzodiazepines. The therapeutic effects start within 30 min of an initial dose and continue, depending on dose and individual pharmacokinetic profile, for approximately 3–4 h for methylphenidate and a little longer for dexamphetamine. It is therefore necessary for most people to take a dose every 3–4 h throughout the day to obtain a sustained effect.

Treatment regimens in adults are similar to those used in children. The usual dosage regimen for short-acting methylphenidate (Ritalin and Equasym) is between 10 and 20 mg taken three-times daily. A few individuals are very sensitive to stimulants and require doses as low as 2.5–5 mg twice daily. More common are individuals who are relatively drug resistant and require higher doses (up to 30 mg four-times daily) before an adequate response is observed. The reason for this interindividual variability in dosage regimens has not been well studied, but is likely to be due to differences in metabolism of stimulant drugs and not primarily due to body mass considerations.

To increase the ease of taking methylphenidate, improve compliance and reduce the on-off effects of short-acting stimulants, long-acting preparations are now marketed. This is particularly useful for adults who become forgetful or disorganized once the effects of medication start to wear off. Another potential advantage is reduced abuse or diversion potential, although evidence that either occurs when stimulants are appropriately prescribed for individuals with ADHD is very limited. Concerta is a long-acting form of methylphenidate that, in most cases, only needs to be taken once daily with an action

lasting 8–12 h in most people, although a few individuals report effects lasting as little as 4–5 h. A rough dose equivalent can be calculated on the basis that each 18 mg dose of Concerta is equivalent to 4–5 mg three-times daily of short-acting methylphenidate. It is therefore not unusual in adults to use doses of Concerta up to 108 mg for adequate clinical response [34]. In cases that do not respond well to methylphenidate, have idiosyncratic side effects or require a more potent option, Dextrine provides a useful alternative. The most common dose regimen for Dextrine is 5–10 mg three-times daily, but in a few cases higher doses of up to 30 mg three-times daily can be effective.

Although stimulants are the most studied and most effective treatment for ADHD in both children and adults, their use in adults remains controversial across Europe. At the time of writing, none of the stimulants are licensed for use in adult ADHD, although this situation is expected to change within the next few years. Hesitancy and uncertainty about using treatments that are classified as controlled drugs and are not licensed for use in adult ADHD is understandable but not supported by the available evidence. Reluctance to prescribe stimulants is not generally shared by child and adolescent psychiatrists who are aware of the potential benefits and relative safety of stimulants in children. It is therefore an unusual scenario that a treatment considered suitable for children is not accepted for use in adults, and it creates a particular difficult problem for patients making the transition from child to adult psychiatric services and those suffering from ADHD symptoms as adults.

Atomoxetine

An alternative treatment is atomoxetine (Strattera®), a specific noradrenergic reuptake inhibitor that is now established as the major second-line, and in some cases first-line, treatment for ADHD. Atomoxetine is licensed in the USA for the treatment of ADHD in both children and adults, although in the UK it is only licensed for treatment of adults who started atomoxetine in childhood or adolescence. Atomoxetine represents a potential breakthrough as a major alternative to stimulant drugs in the treatment of ADHD. Initial trials suggest that atomoxetine is as effective as conventional stimulants, although there is as yet far less clinical experience in the use of this medication [35–37].

Other drug treatments

The effectiveness of other medications is not so well established, although there is consistent evidence for reduction of ADHD symptoms in adults from noradrenergic antidepressants [37]. Second-line choices therefore include antidepressants with noradrenergic effects such as desipramine, venlafaxine and reboxetine. Another nonstimulant medication that is widely used in the USA and shown to be a well-tolerated and effective treatment for adult ADHD is bupropion [38].

Side effects of medication

Common side effects of stimulants include decreased appetite, insomnia when taken in the evenings, headaches and nervousness or dysphoria. In most cases these are transient or mild and

only occasionally require the medication to be stopped or changed. Decreasing the dose, altering the stimulant or changing to a nonstimulant medication should be considered if the symptoms persist. Atomoxetine and antidepressants can all cause constipation, dry mouth, nausea and postural hypotension. Bupropion can cause seizures, insomnia and headache. All drug treatments for ADHD can cause minor but statistically significant increases in heart rate and blood pressure, so it is recommended that adults with ADHD should have their blood pressure and heart rate checked at baseline and periodically throughout treatment [39].

Psychotherapeutic interventions

There has only been limited evaluation of psychotherapeutic interventions and no controlled trials. Interventions that have been used include psychoeducation, use of support groups, skills training, CBT, coaching and counseling [41–43].

Coaching

Formal studies of the effectiveness of coaching and psychoeducation have not been performed, but many adults with ADHD report that they gain benefit from these approaches. Coaching is a structured, supportive therapy that can be offered individually or by group sessions. The purpose of coaching is to learn new problem-solving skills for identified practical problems. Due to the early onset and persistence of ADHD, patients have often failed to learn to cope with the practical and organizational demands of daily life. Skills such as time management and the use of tools such as checklists and handheld computers can be trained in a step-by-step program. The support and recognition of typical ADHD difficulties by group members is an additional and powerful treatment tool during coaching in the group. Themes of coaching include acceptance of the disorder, learning to deal with time management, learning to limit activities to one goal at a time, organizing home management and finances, and dealing with relationship difficulties.

Psychotherapy

Wilens and McDermott have reported the benefits of using CBT in combination with medication [43]. CBT should be studied as a complementary treatment to the use of stimulant medication and may be sufficient for adults where considerable moderation of symptoms has occurred with age. CBT can also be useful as a complementary treatment for comorbid anxiety and depression that is commonly associated with adult ADHD. The ability of individuals to make the best use of CBT approaches may correlate with general cognitive ability, and clinical experience finds that many adults with ADHD have already developed effective strategies to cope with persistent ADHD symptoms; often entailing a high cost in the amount of time and effort required to complete many everyday tasks. Other forms of psychotherapy, such as counseling or client-based psychotherapies, will have an important role in helping some individuals come to terms with and better understand the

way that ADHD has influenced their personal and emotional lives. Treatment with stimulants presents great opportunities but is also a time of great change; individuals need time to re-evaluate their lives in the face of renewed opportunities.

Treatment of comorbid conditions

The order of treatment of ADHD and comorbid disorders depends on the severity of the different disorders and a clinical judgment on which disorder is driving the current level of behavioral impairments or mental state changes. In many cases, it is appropriate to treat both ADHD and comorbid conditions simultaneously. It is therefore important to provide a diagnostic formulation based upon consideration of the possible differential diagnoses. A critical aspect of the formulation is to draw the distinction between symptoms that commonly co-occur with ADHD and may therefore be reasonably expected to respond to stimulants (e.g., chronic mood instability) or other major psychiatric disorders that require targeted treatments (e.g., major depression).

Attention deficit hyperactivity disorder & mood symptoms

A volatile and irritable mood is frequently observed in adult ADHD and is not usually the consequence of comorbid depression or bipolar disorder. In this case, treatment should be targeted at ADHD. On the other hand, this symptom clearly overlaps with that observed in major affective disorders and care must be taken to ensure that mood lability does not occur solely within the context of such disorders. This is determined by attending to the time course of the symptoms (i.e., early onset, chronic-trait-like course, frequency of mood swings four- to five-times a day, no recent deterioration or severe exacerbation) and the detailed psychopathology (i.e., whether the mood swings are extreme, low or high moods sustained for longer periods or are associated with other features of major affective disorder). Some individuals previously diagnosed with atypical depression, cyclothymia or unstable emotional personality disorder have a primary diagnosis of ADHD with good response to stimulants.

Individuals with ADHD may present with major depression. In this case, treatment of depression would become the priority due to the severe and immediate risks of untreated depression. Moreover, persistence of major depression will interfere with the interpretation of the efficacy of treatment for ADHD. The severity of ADHD symptoms and the need for stimulant medication can be considered once improvement for the depression has been observed. Data on the combined use of antidepressants and stimulants are lacking, although clinical experience suggests that the combination of antidepressants with stimulants is effective and safe.

The frequency of comorbid bipolar disorder with ADHD is currently subject to discussion and research due to the symptom overlap (irritability, volatility, overactive thought processes, restlessness, overactive behavior and impulsive behavior), especially in the case of juvenile-onset bipolar disorder [KLEIN C, WENDLING K, HUETTNER P, PEPPER M. SUBMITTED, 30,31]. However, the distinction

is far easier to make in adults and is only rarely a diagnostic dilemma in adult clinics. Compared with bipolar disorder, ADHD has a much earlier age of onset and a chronic persistent course. Mood swings are less extreme and more frequent (~four- to five-times a day), are interspersed by short periods of normal mood and there are no extended periods of very low or high moods. Grandiosity is not a feature of ADHD. Thoughts may be ceaseless and unfocused (a distracted mind) but are not speeded up, do not show flight of ideas and are not experienced as unusually clear or special. Finally, adults with ADHD may have a family history of ADHD and other developmental disorders but rarely of bipolar disorder or schizophrenia. In cases of comorbid bipolar disorder with ADHD, differential diagnosis may be difficult.

Attention deficit hyperactivity disorder & anxiety symptoms

Individuals with ADHD commonly report high levels of anxiety on rating scales. However, a more detailed enquiry about the psychopathology shows that in some cases the ADHD syndrome mimics apparent anxiety symptoms and the primary treatment should therefore target ADHD. For example, individuals with ADHD frequently have difficulty coping with social situations (especially social groups) because they are unable to focus on conversations and tend to tune out. They may as a consequence worry about how they will cope in such situations (i.e., an understandable concern) and as a result avoid group interactions. A similar scenario can occur with simple tasks such as shopping due to their experience of forgetting things, high levels of disorganization and intolerance of having to wait in shopping queues. The difficulties coping with simple everyday tasks that most take for granted are a source of considerable concern and are often accompanied by avoidance of stressful tasks and poor self-esteem. In combination with ceaseless mental activity, these legitimate concerns and responses take on the appearance of a mild-to-moderate anxiety state, although lacking the systemic manifestations of anxiety disorders. Some patients try to cope with disorganization by getting overly rigid and perfectionist, in order to have some control over the chaos. This behavior can mimic obsessive-compulsive disorder, but does not have the function to avert fear. It serves to control complete chaos. As with the major affective disorders, the key to understanding the comorbid symptoms is to focus on the precise phenomenology and consider whether they have a similar onset and time course to the ADHD symptoms and the extent to which they may reasonably be a consequence of core ADHD symptoms.

Of course, it is also the case that many individuals with ADHD will develop more typical anxiety states and it will then be important to consider whether primary treatment should be targeted at the anxiety disorder. A judgment will need to be made on the severity of the anxiety and the strength of the current relationship between the anxiety and the ADHD symptoms. Three main courses of action can then be considered:

- Medication for anxiety (e.g., selective serotonin reuptake inhibitor) followed by medication for ADHD (e.g., stimulant medication)

- Medication for ADHD followed by medication for anxiety
- Stimulant medication for ADHD followed by cognitive behavioral treatment for anxiety

Untreated anxiety symptoms can deteriorate using stimulant medications. In such cases, initial pharmacotherapeutic treatment of the anxiety disorder (especially panic disorder) is advised. Although it is possible to introduce two medications at the same time, it is usually advisable to introduce them one by one. If the anxiety symptoms are severe and warrant immediate treatment, the first option should be followed, but the introduction of stimulant medication should be considered early on if ADHD symptoms are considerable, since they may contribute to maintenance of the anxiety state. Finally, psychologic interventions are far more likely to succeed once some control has been gained on the core ADHD symptoms using stimulants or atomoxetine.

Attention deficit hyperactivity disorder & substance-use disorders

ADHD is a risk factor for substance-use disorders through three potential mechanisms:

- Increased levels of reward-seeking (risk-taking) behaviors
- Increased level of psychosocial impairments, oppositional defiant disorder and conduct disorder in childhood that are themselves associated with substance abuse
- Self-medication for ADHD symptoms

It should be remembered that children with ADHD often show a very poor academic performance compared with their ability, have difficulties in developing healthy social interactions and a tendency to act in an impulsive way that may lead them to hang out with other individuals showing poor social integration. Family background and other environmental risks are another set of factors to take into consideration. The reason for the increased level of substance-use disorders among individuals with ADHD is therefore necessarily complex.

In most cases, severe substance-use disorders should be treated first because of the known risks and impairments associated with such behavior. Ongoing substance abuse will interfere with the evaluation of ADHD treatment response, interactions will emerge and side effects can be intensified. Therefore, all substance use should be minimized before the start of medication for ADHD. However, it is important to recognize the role that persistent ADHD symptoms play in maintaining substance abuse. For example, street amphetamine, cocaine and Ecstasy may be used to calm the mental and physical restlessness associated with ADHD. However, self-treatment with stimulants is only occasionally observed, while the use of alcohol and cannabis to dampen down symptoms associated with adult ADHD is far more common. Difficulties in adjusting lifestyle due to persistent ADHD symptoms and associated psychosocial impairments, and the increased level of risk-taking behaviors associated with untreated ADHD, are other factors.

For these reasons it has been argued that it is important to use stimulant medication to decrease the level of ADHD symptoms in comorbid adult ADHD and substance-use

disorders. Case reports support the view that treatment of ADHD with stimulants may diminish the need for substance use in adults. A recent meta-analysis of follow-up studies confirmed that treatment of ADHD with stimulants is associated with an average twofold reduction of substance-use disorders in adolescents with ADHD [32]. The concerns of some professionals that use of stimulants in ADHD may lead to drug abuse either by sensitization or as a gateway to other drugs is not supported by available evidence. Although there may be a small risk that a few individuals with drug abuse problems may sell his or her stimulants, it is important to note that stimulants used appropriately by adults do not cause euphoria and are neither habit forming nor addictive.

Attention deficit hyperactivity disorder & personality disorders

The relationship of ADHD to personality disorders is complex and to some extent semantic. There is no doubt that ADHD is a risk factor for the development of conduct disorder and adult antisocial behaviors. There is, however, considerable confusion that stems from the early onset and persistence of ADHD symptoms, which therefore appear to be traits or personality characteristics rather than symptoms. The difference in definition between a trait and a symptom is that symptoms represent a change from a normal premorbid state, such as the onset of adult depression or psychosis, whereas traits are considered to be enduring characteristics. Current psychiatric training tends to focus on the distinction between symptoms and traits and gives rise to a nosology that does not fit well with the concept of ADHD. First, because of the trait-like quality of ADHD phenomena, significant psychopathology often goes unnoticed or is regarded as a personality characteristic that is not amenable to pharmacotherapy. Second, because ADHD phenomena are frequently associated with persistent disruptive and oppositional behaviors or development of poor interpersonal skills, it is again assumed that this represents an ingrained and therapeutically resistant set of behavioral traits. Further confusion stems from the definition of cluster B personality disorders, such as antisocial, borderline and emotionally unstable personality disorders, which include symptoms such as mood instability, impulsivity and anger outbursts that are also common features of adult ADHD.

The issue for diagnosis and treatment is to recognize when there is evidence for ADHD; that is, whether the operational criteria were fulfilled in childhood and whether ADHD symptoms that started in childhood have persisted and continue to bring about significant impairments. While the diagnostic focus should be on the main symptoms that define inattention, overactivity and impulsivity, it is also important to remember that mood instability and impulsivity are common components of the ADHD syndrome. Care must be taken to distinguish between uncontrolled, impulsive, oppositional and antisocial behaviors that arise in the context of a specific ADHD syndrome from those that do not. For this reason, it is often useful to make particular enquiries about symptoms that are more specific to ADHD, such as short attention span,

variable performance, distractibility, forgetfulness, disorganization, physical restlessness and over talkativeness, rather than focus on the occurrence of maladjusted and disruptive behaviors (which do not define ADHD).

Where ADHD and personality disorder occur together, treatment of ADHD can effectively diminish problems of inattention, impulsivity, mood swings and associated aggressive behavior, and may lead to greater adherence and responsiveness to psychotherapeutic interventions. For this reason, treatment of ADHD is advised before starting treatment of personality disorders. However, it should be recognized that, although stimulant medication may treat specific symptoms of ADHD, overall prognosis may be poor for some individuals who cannot engage in behavioral or psychotherapeutic interventions or do not have the capacity to alter maladaptive patterns of behavior. In a few cases, compliance with stimulants can be poor even when informants such as parents and close friends report an improved behavioral response. This may be because the increased focus and ability to reflect on patterns of behavior that accompanies treatment of ADHD may be difficult to tolerate for some individuals who may find it easier or more exciting to remain in the relative haze and fog of untreated ADHD.

Attention deficit hyperactivity disorder & psychotic disorders

Psychotic symptoms should be diagnosed and treated using conventional antipsychotic medication. Severe inattention may rarely mimic the thought-disorder symptoms observed in some psychoses, such as derailment, tangentiality, circumstantiality and flight of ideas. Careful monitoring of both psychotic and ADHD symptoms is advised but it may be very difficult to distinguish residual and negative symptoms of schizophrenia from persistence of ADHD symptoms. In general, the use of stimulants (dopamine agonists) is not advised for the treatment of comorbid ADHD and psychotic symptoms. In a few rare cases it is possible that stimulants could trigger a relapse (or first episode) of a psychotic illness. Acute psychotic reactions to stimulants are rare but have been reported. Alternative treatments for ADHD should be considered in such cases, and atomoxetine would currently be the first-line option. In some cases, stimulants have been used alongside traditional antipsychotics and, despite the apparent contradiction in such a regimen, have been successful in controlling both conditions. For this reason it is reasonable to keep such a combination where it has already been initiated and appears to be successful.

Expert commentary

Currently, only very few psychiatrists with expertise in general adult psychiatry have acquired the necessary knowledge to diagnose and treat ADHD and it remains the case that the majority do not yet recognise the clinical needs of this group. However, the ability to diagnose and treat ADHD requires clinical skills that are similar to those used to diagnose and treat other common psychiatric disorders. General adult psychiatrists are well versed in the detailed psychopathology and

clinical course of anxiety, affective and other psychiatric disorders and therefore have all the expertise required to differentiate ADHD from other psychiatric disorders. What is required is additional training to raise the level of awareness of ADHD, its onset, course and outcome in adults and the best forms of management. Specialist clinics have a key role to play in advising, supporting and training clinicians in this area and can assist in the management of clinically more complex cases. The experience of general adult psychiatrists who have taken the step to diagnose and treat adult ADHD has been extremely rewarding due to the availability of effective treatments for this important and common clinical group.

Five-year view

ADHD is not a new disorder. It was first documented by Still in 1902 who described a hyperactive behavior pattern occurring when brain damage was expected and was considered to be a 'defect of moral control'. The well-known description of 'fidgety Phil', however, was written by Heinrich Hoffmann in 1844 and is a perfect description of the combined subtype of ADHD. The increased risk to close relatives has been known since the early 1970s and we now know that this is predominantly the result of shared genetic risk factors with heritability estimates in the order of 60–90%. Charles Bradley first noted the effectiveness of stimulants to treat hyperactive children in 1937 and Ritalin was introduced as a treatment in 1956.

The recognition and treatment of ADHD in all age groups has, however, lagged behind that of other major psychiatric disorders. The precise reasons for this are unclear but may relate to the fact that ADHD is best perceived as a quantitative trait distributed throughout the population and there are no obvious discontinuities between normal and abnormal levels of ADHD symptoms. The persistence and stability of ADHD symptoms over time, high level of intraindividual variability in behavior and academic performance, occurrence of similar behavior patterns among parents and siblings, association with measures of poor and inconsistent parenting, and high levels of expressed emotion give the impression of a behavioral problem associated with abnormal personality development that has for many years been causally linked with poor parenting. Recent advances in our knowledge of the etiology of ADHD has altered this perspective and childhood ADHD is now widely perceived as an important neurobiologic disorder resulting from genes and their interactions with risky environments [30], and few child and adolescent psychiatrists now question the use of stimulants to treat ADHD. In the UK, treatment of ADHD has dramatically changed in the last 10 years, with a marked increase in its diagnosis and a doubling of stimulant prescriptions between 1998 and 2004.

However, this change in perspective is only slowly filtering through to those engaged in treating the adult population. For adults, ADHD symptoms are regularly perceived as immutable,

resistant to drug treatment and relatively resistant to behavioral and psychologic interventions. At the present time, the recognition of adult ADHD remains a rare specialist concern among adult psychiatrists, despite evidence that the disorder and its psychiatric and psychosocial ramifications are common. However, it is inevitable that this perspective on treating adults with ADHD will change over the next 5–10 years, as more young people with ADHD come into the adult services and awareness of the condition increases among patient groups and professionals alike. The number of clinical training meetings on this topic in the UK is increasing rapidly and public awareness has been raised through programs such as BBC Horizon. Drug companies that market stimulants and nonstimulant treatments for ADHD are in the process of organizing drug trials in the adult population with the aim of licensing some of these drugs for the treatment of adult ADHD. Currently, however, it remains an anomaly that drugs that are considered to be safe and effective in children and adolescents are not licensed for use in adults.

We are now starting to see the clinical rewards that stem from increased research in the field of neurodevelopmental lifespan disorders. As we learn more about the genetic and environmental origins of behavioral disorders, we are starting to delineate the lifespan outcomes of disorders that start in childhood and their impact on adult psychopathology. The umbrella term 'personality disorder' is starting to break down into a series of identifiable conditions that includes, in a proportion, ADHD, autism and Asperger's syndrome. This change is very welcome for those suffering from neurodevelopmental disorders that have their own etiology, course, outcome psychopathology, associated risks and response to treatments. Moreover, we are seeing that many individuals with minor but persistent mood disorders are suffering from untreated ADHD and this is another category that can be further subdivided. My prediction is that within 10 years many patients previously categorized with atypical (and some typical) forms of affective or personality disorder will be diagnosed with adult ADHD and effectively treated for the first time.

Key issues

- Why should we be interested in adult attention deficit hyperactivity disorder (ADHD)? (i) ADHD is a common, heritable behavioral disorder that gives rise to significant social and academic impairments and the risk for negative long-term outcomes. (ii) There is no doubt that in some cases ADHD symptoms persist into adult life and cause significant clinical impairments. (iii) The main clinical issue is recognition of the disorder in adults and quantifying the load on adult psychopathology. (iv) ADHD is a treatable condition.
- ADHD is an increasing load on adult psychiatry. (i) Young people come into adult life still receiving stimulants or other treatment for ADHD. (ii) Adults are increasingly recognizing themselves as having been disabled by ADHD. (iii) Psychiatrists dealing with anxiety, depression, personality disorders, substance abuse and (rarely) chronic hypomania will find that some individuals have a lifetime diagnosis of ADHD. (iv) Forensic psychiatrists encounter a high frequency of cases.
- Do children grow out of ADHD? (i) Symptoms decline with age. (ii) Full childhood ADHD criteria are less often met. (iii) However, differences between ADHD cases and controls are maintained. (iv) Age-appropriate impairment continues. (v) Medication effects still present in adulthood.
- Service provision. Mental health services for adult ADHD are rare in the UK and across Europe. This leads to a high level of untreated psychiatric morbidity in this patient group.
- ADHD in adults is frequently misdiagnosed. This stems from limited training and awareness of this common treatable condition. Psychopathology overlaps with other psychiatric conditions in two main ways: (i) The chronic trait-like characteristics of ADHD symptoms that start in early childhood and persist into adulthood are frequently mistaken for traits of a personality disorder. (ii) The frequent prominence of affective instability alongside typical ADHD symptoms often leads to diagnosis of atypical affective disorder or cyclothymia.
- Comorbid conditions are common. ADHD is associated with comorbid conditions including drug and alcohol abuse, anxiety and depression, impulsive antisocial behavior, and the development of personality disorders. Treating ADHD alongside these comorbid conditions is required for effective treatment.
- Known treatment response. The evidence base for the short-term symptomatic response to stimulants such as methylphenidate is good. Atomoxetine, a specific noradrenergic re-uptake inhibitor, also has proven efficacy. Although the use of stimulants and atomoxetine are licensed for use in children, it remains anomalous that they are not licensed for use in adults. The evidence base supporting the current licensing situation is poor, since several drug trials consistently demonstrate the efficacy and safety of stimulants. Despite common concerns over drug abuse potential, the evidence of diversion and abuse of stimulants and atomoxetine is very limited. In contrast, the appropriate therapeutic use of stimulants is associated with a twofold reduction in drug and alcohol misuse disorders.
- Key issues for the clinical management of adult ADHD. (i) Adult ADHD is no more difficult to diagnose and treat than other common adult psychiatric disorders. (ii) Adult ADHD is commonly misdiagnosed. (iii) Adult ADHD is a treatable condition in most cases. (iv) Adult ADHD should be within the remit of general adult psychiatry.

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