

# Attention-deficit hyperactivity disorder: a clinical review of the concept, diagnosis and management

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The history of psychiatry is the history of therapeutic enthusiasm with all of the triumph and tragedy, hubris and humility that this brings. As a result, the emergence of any new diagnosis, such as attention-deficit hyperactivity disorder (ADHD), needs to be greeted with caution, rigour and scientific objectivity, as well as compassion, therapeutic engagement and optimism. Although there is now little doubt that ADHD is a valid, useful diagnostic concept, and progress has been made, there is still considerable work to be done to establish its incidence, prevalence and biological underpinnings, as well as optimal therapeutic strategies. As with all mental illnesses, it is likely that knowledge will develop over many decades and diagnostic criteria will be refined in parallel. In the absence of definitive biological understanding, there should be particular caution about over-exuberant diagnostic expansionism unless it is accompanied by compelling evidence of therapeutic benefit for those diagnosed.

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The history of psychiatry is a history of therapeutic enthusiasm (Kelly, 2016). Diagnoses come and go, therapies change over time, and, at any given point, the landscape of psychiatry can be dramatically transformed within a few brief, dramatic years (Shorter, 1997). Nowhere is this more evident today than in relation to attention-deficit hyperactivity disorder (ADHD) and its various articulations by the World Health Organization (WHO, 1992) and American Psychiatric Association (APA, 2013).

The papers in this special issue of the *Irish Journal of Psychological Medicine* examine various specific aspects of ADHD. The purpose of the present paper is to provide an overview of the context in which the concept of ADHD has developed, contextualise some of the current discussions about the disorder, and provide information for clinicians who seek guidance about what to do in day-to-day clinical practice. More specifically, this editorial is written from the viewpoint of a practicing psychiatrist who is *not* a specialist in ADHD, and it aims to sketch out a broader context within which readers can locate the more specific papers in this special issue.

## Why is ADHD still controversial?

Also known as ‘hyperkinetic disorders’ (WHO, 1992), there are few descriptions of syndromes similar to

ADHD in the ancient literature, and accounts of analogous conditions only appear in European literature from the late 1700s and in the United States from the early 1800s (Matthews *et al.* 2014). This is a relatively late appearance compared with other conditions, such as depression and psychosis, which feature commonly in early medical literatures (Kelly, 2016). A full history of the emergence of the concept of ADHD over past centuries is provided by Lange *et al.* (2010). In the more immediate past, it is clear that diagnoses such as ‘hyperkinetic impulse disorder’ or ‘hyperactive child syndrome’ had entered use by the late 1950s, although these were generally loosely descriptive phrases rather than rigorously itemised diagnostic schemas (Burks, 1960; Chess, 1960).

From a more formal perspective, childhood disorders were introduced as distinct diagnostic entities for the first time in the second edition of the APA’s *Diagnostic and Statistical Manual of Mental Disorders (DSM-II)* and were all described as ‘reactions’, including ‘hyperkinetic reaction of childhood’ (APA, 1968). As a result, the formal diagnosis of ADHD is a relatively new development and, consistent with this, there has been considerable interest in establishing its incidence and epidemiology. It is now relatively clear that the disorder is more common in boys than girls, and has an overall prevalence of 3.4% in children (Thapar & Cooper, 2016). Prevalence in adults is not yet firmly established, but might be around 2.5%.

Estimates of prevalence vary widely, however, and popular media report that in certain parts of the US up to 30% of boys are diagnosed with the disorder

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(Honigsbaum, 2016). That is a genuinely disturbing statistic because over-diagnosis is harmful for *all* children, not only for those wrongly diagnosed, but also for those whose genuine problems risk being dismissed as part of a wave of over-diagnosis that is clearly driven, at least in part, by non-medical considerations.

As a result of this and various other trends, ADHD generates endless discussion and debate. Some of this debate is important and admirably focussed on the well-being of children and adults with the cluster of specific problems currently labelled 'ADHD'. But much of the discussion seeks to use the concept of 'ADHD' to make broader arguments about the nature of our societies, arguments that have little to do with psychological well-being or mental health. While these latter discussions are certainly important from sociological and anthropological perspectives, they often cloud consideration of the important mental health and learning issues at hand, especially for children during valuable school years.

From a clinical perspective, some commentators argue that the diagnosis of ADHD is grossly over-used and simply medicalises certain long-recognised behavioural issues which should be dealt with in other, non-'medical' ways. Some say ADHD does not even 'exist'. Clearly, these commentators have a point to a certain extent: ADHD, like all mental illnesses, is defined based on a set of commonly co-occurring symptoms rather than any fixed, specific biological abnormality; that is there are no scans or blood tests for ADHD. As a result, ADHD 'exists' only as a clinical concept or a description of a set of symptoms that are commonly reported to occur together.

But on the other hand, the clinical description of ADHD is a very compelling one, and many commentators point to the undeniable existence of hyperkinetic (hyperactive) and attentional behaviour problems in a small but significant number of children and adults. They argue that there are mental health services where the diagnosis of ADHD is not given or is under-used, and that under-diagnosis and over-diagnosis both have adverse effects, not least because both contribute to a sense of lack of validity and both create confusion. They argue that, regardless of the label used (currently 'ADHD' but likely to change), any treatment strategies that assist the child or adult to manage problem behaviours, experience less distress, and get on with life, are greatly to be welcomed.

The latter group makes more sense, on a pragmatic rather than ideological basis: yes, the diagnostic terminology will change again with time; yes, the clinical description of ADHD will evolve further and is, at best, imprecise; yes, ADHD is probably over-diagnosed in certain areas and under-diagnosed in others; and, yes, critics have a certain point when they say that 'ADHD' does not, in a certain sense, 'exist' as a defined biological entity.

But all of that is to miss the central point, which concerns human suffering: it is an undeniable reality that certain children and adults present with many of the features currently called 'ADHD' and their impairments and distress are very real. Moreover, there are management strategies which can reduce this distress and these should be provided, regardless of whether or not any specific diagnostic label is used. In this context, it is important any disempowering effects of a diagnosis such as 'ADHD' are outweighed by therapeutic benefits following diagnosis. And, equally, it must be clear that receiving a diagnosis of ADHD (or anything else) does *not* mean that all personal responsibility for behaviour is removed. All of the arguments 'against' ADHD should be considered with care but they should not prevent or delay delivery of treatments that reduce the distress experienced by people with these symptoms (however they may be labelled or not labelled).

At all times, it must be remembered that ADHD, as with all psychiatric diagnoses, is essentially a cluster of symptoms that commonly co-occur (Kelly, 2015). Many children or adults have some but not all of the required symptoms, while others have additional symptoms that might just as reasonably have been included in the original definition of ADHD but weren't – and might well be included in the future when criteria are revised again. Such revisions are not arbitrary; they are based on patient studies and additional information about the disorder as it emerges.

For any given child (as with any given adult), the key issue is *not*: Does this person precisely tick all the boxes for all the current criteria for ADHD or any other disorder? Rather, the key question is: If this person's symptoms accord generally with most of the criteria listed for a given disorder such as ADHD, does making such a diagnosis lead us to a management plan or treatment strategy that will be helpful *for this person*?

In other words, what is the *point* of 'diagnosing' this disorder in this person at this time? How does it *benefit* this person? This is critical: defined diagnoses are not set in stone; diagnostic criteria are changeable guidelines, *not* to be used in a tick-box fashion; and specific diagnoses are only useful insofar as they direct us towards an understanding or treatment or management plan that will help this particular person with whatever symptoms are causing distress. One must be pragmatic and focus on reducing distress and suffering. Ideological arguments about ADHD certainly have their place but they are secondary to the therapeutic considerations and reduction of suffering.

### Key features of ADHD

All that being said, and all the critics being duly noted, the key clinical features of ADHD have been described

many times in recent decades and now include a fairly reliable cluster of features centred on inattention, distractibility, impulsivity and over-activity. The WHO (1992), in its description of 'hyperkinetic disorders' in its *International Classification of Diseases (ICD-10)*, emphasises the disorder's early onset, and its combination of poorly modulated, overactive behaviour, combined with marked inattention and lack of persistent task involvement. The WHO's 'hyperkinetic disorders' are taken as broadly equivalent to ADHD in DSM-5 (APA, 2013).

The problem here is that most children demonstrate some if not all of these characteristics at one point or other. According to the WHO, the diagnostic threshold for ADHD lies in the presence of more of these features than is common; their early onset (usually in the first 5 or 7 years of life); their pervasiveness in multiple settings (at least two settings; e.g. school and home); their persistence over time; and their severity and effects, resulting in significant disruption to the child's home life, school life, etc.

The inattention associated with ADHD is evident in the fact that children with the disorder generally break off from activities, leaving them unfinished; lose interest quickly; and move from activity to activity at a rate out of keeping with their age and IQ. The over-activity is especially apparent in situations requiring calm and concentration, or situations requiring particular self-control. In ADHD, this over-activity is out of keeping with the child's age and IQ, and is excessive in the particular situation. It is also relatively common for children with ADHD to also have other disorders, such as conduct disorders or language delay, which can complicate the picture. Presentation in adults is similar but not identical, owing to the older age of adults.

### Treatment of ADHD

Despite the fact that the causes of ADHD are not fully known (although real progress is being made) (Thapar & Cooper, 2016), there is mounting evidence to support certain treatment approaches. Education and training programmes for children and families are central, in combination with classroom interventions by teachers and special needs assistants. These interventions focus on behavioural strategies to reduce and manage problem behaviours, as well as promoting pro-social behaviour and enhanced learning. Co-existing difficulties, such as language delay, can be especially difficult to identify and address owing to the presence of ADHD, but these must still be included in the treatment and management plan from the earliest stage possible: we are treating a person, not an illness.

Treatment can be challenging for all concerned, including, most especially, the child or adult with ADHD.

This is an often controversial area, filled with speculation and a great deal of debate. In February 2016, the National Institute for Health and Care Excellence (NICE) in the United Kingdom published very useful, updated, evidence-based guidance on 'attention deficit hyperactivity disorder: diagnosis and management'. Discussions of diagnosis and management in this paper are based on these NICE guidelines.

NICE emphasises the importance of identifying possible ADHD and referring appropriately; careful diagnosis (which should not be based solely on rating scales, which are helpful rather than definitive); advice about diet, behaviour and general care; specific treatments, including psychological treatments, parent-training/education programmes and medication; and careful transition to adult services for young people with the disorder (NICE, 2016).

In terms of diagnosis, NICE advises *against* universal screening for ADHD: most children are fine and there is a real risk of over-diagnosis. If the child's problems with behaviour or attention appear to indicate ADHD, a school special needs coordinator and the parents should be notified early on. Healthcare professionals should consider a period of watchful waiting for up to 10 weeks, as well as offering parents or carers referral to a parent-training/education programme. This referral should not wait for a formal diagnosis of ADHD as such a programme may be of use for the parents or carers of children who do not have ADHD but still present significant challenges.

If problems persist or are severe, a diagnosis of ADHD should only be made in secondary care; for example by a paediatrician, child psychiatrist, or other appropriately qualified member of a child and adolescent mental health team. Diagnosis should be based on full clinical and psychosocial assessment; developmental and psychiatric history; and assessment of mental state. Social, family, educational and occupational circumstances, as well as physical health, should all be considered. Rating scales may be helpful but are not, on their own, definitive.

NICE recommends that, following diagnosis, a balanced diet, good nutrition and regular exercise are important. There are no foods that all children with ADHD should be advised to avoid, but if a particular child appears to be affected by a particular food, the matter should be discussed with a dietitian and the child and adolescent mental health team. For pre-school children, drug treatment is not recommended but parents or carers should be referred to a parent-training/education programme. It is important that the child's nursery or pre-school teacher is also involved in the plan and any special educational needs are identified and addressed both at school and at home, as appropriate. Regrettably, access to some of these treatment

options can be substantially hampered by resource limitations; some mental health services have little access to dietitian services for people with eating disorders let alone people with ADHD.

### Medication for ADHD

For school-age children with ADHD and moderate impairment, NICE recommends group-based parent-training/education programmes as the usual first-line intervention. This can include group psychological treatment (cognitive behavioural therapy or social skills training) for younger children and individual psychological treatment for older age groups. Treatment with medication may be tried next for those with moderate levels of impairment or severe symptoms.

For those with severe impairment, medication is recommended as a first-line intervention, along with parent-training/education programmes. If this is not acceptable to the patient or parents/guardian, psychological interventions can be tried but NICE warns that these are not as effective as medication for those with severe ADHD and severe impairment. In all cases, it is important that, with consent, the child's teacher is aware of the plan; classroom behavioural interventions, when possible, are very helpful.

Before commencing medication, it is important that there is a full history and medical examination, including assessment of heart rate, blood pressure, height, weight and family history (e.g. of cardiac disease). An electrocardiogram is advised if there is a relevant family history, along with a risk assessment for substance misuse or medication diversion (i.e. the child giving the tablets to someone else).

NICE notes that the choice of medication depends on a series of factors, and, broadly, recommends methylphenidate, atomoxetine and dexamfetamine within their licenced indications. At time of writing, all three of these medications are licensed for use in certain children aged 6 years and over in Ireland, subject to specific conditions and as part of comprehensive treatment programmes. Up-to-date licensing information should always be sought from the website of the Health Products Regulatory Authority ([www.hpra.ie](http://www.hpra.ie)).

NICE recommends methylphenidate for ADHD without significant co-existing problems or when it is accompanied by conduct disorder. Either methylphenidate or atomoxetine is recommended if the ADHD is accompanied by tics, Tourette's syndrome (a neurological disorder with involuntary tics and vocalisations), anxiety disorder, misuse of stimulants or risk of stimulant diversion. Methylphenidate and dexamfetamine appear to increase levels of dopamine, whereas atomoxetine increases noradrenaline, among other effects.

It is important to monitor for side-effects. With atomoxetine, there should be particular vigilance for irritability, agitation, suicidal thinking, self-harming behaviour, or unusual changes in behaviour, particularly in the months after commencement or following a change in dose. This should be explained to parents or carers who should bring any such side-effects to the attention of healthcare professionals as soon as they occur. Parents and carers should also be aware of the possibility (albeit rare) of liver damage with atomoxetine; signs can include abdominal pain, nausea, malaise, jaundice or darkening of the urine.

For adults with ADHD, NICE recommends that medication (under specialist supervision) should be the first line of treatment, unless the person prefers a psychological approach. As with children, there should be a detailed pre-medication assessment, and the overall treatment plan should include not just medication but also elements addressing behavioural, psychological, educational and occupational needs. Methylphenidate is recommended by NICE as the medication of choice, but is not licensed for new treatment in adults in Ireland at time of writing. NICE suggests that if first-line treatment does not prove sufficient or the patient cannot tolerate it, atomoxetine (licensed for adults in Ireland, under certain conditions) or dexamfetamine (not licensed for adults in Ireland) can be considered. For atomoxetine, there should be careful warnings similar to those outlined for children (see above), especially in younger people and early in treatment. As with children, careful, specialist supervision is needed.

NICE also provides additional guidance for situations when there is a poor response to treatment, when a child with ADHD is transitioning to adult mental health services, titration of medication doses, monitoring side-effects, discontinuation issues, future research directions and various other matters.

The evidence base for many of the treatments recommended by NICE and others is constantly evolving. Sonuga-Barke *et al.* (2013), in a notably comprehensive review and meta-analyses of randomised-controlled trials of dietary and psychological treatments for ADHD, emphasise this point, noting that better evidence for efficacy from blinded trials is required for behavioural interventions, neurofeedback, cognitive training, and restricted elimination diets before they can be recommended as treatments for core ADHD symptoms.

In terms of outcome, hyperactivity in children usually decreases by adolescence but for some children ADHD persists into adulthood. Treatment, as outlined above, can help significantly, but the diagnosis is often missed in adulthood, as it may present in the form of apparent anti-social behaviour. Notwithstanding these

challenges, it is important that the diagnosis is made: ADHD, although currently likely over-diagnosed in some places and under-diagnosed in others, causes substantial difficulties for those who suffer from it, and for their families. Early, effective and sensible treatment is important, as is greater understanding of the nature and effects of this puzzling, evolving disorder.

### Conclusions

The history of psychiatry is the history of therapeutic enthusiasm and, as a result, the emergence of any new diagnosis, needs to be greeted with caution, rigour and scientific objectivity, as well as compassion, therapeutic engagement and optimism. While there is now little doubt that ADHD is a valid and useful diagnostic concept, there is still considerable work to be done to establish its incidence, prevalence and biological underpinnings, and to characterise optimal therapeutic strategies in both children and adults.

As with all mental illnesses, it is likely that knowledge of these areas will develop over many decades and that diagnostic criteria will be refined in parallel. In the absence of definitive biological understanding, there should be particular caution against over-exuberant diagnostic expansionism unless it is accompanied by compelling evidence of therapeutic benefit for those diagnosed.

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### Conflicts of Interest

None.

### Ethical Standards

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