Psychiatry, Psychology and Law, 2019
Vol. 26, No. 6, 817–840, https://dx.doi.org/10.1080/13218719.2019.1695266

Attention Deficit Hyperactivity Disorder (ADHD) and the Criminal Law

Ian Freckelton QC[a,b]

[a]*Barrister, Crockett Chambers, Melbourne, Australia;* [b]*University of Melbourne, Parkville, Australia*

Attention Deficit Hyperactivity Disorder (ADHD) has been identified as significantly over-represented in the prison population and being a likely precipitant to engagement in criminal conduct. There should be little surprise in this fact, as impulsivity, inattentiveness to instructions, inability to retain information and limitations in the ability to think rationally through the likely consequences of actions have long been recognised as criminogenic factors. This article adds to the literature on ADHD and the criminal law. It reviews the history of ADHD diagnosis and treatment and scrutinises important English, Australian, New Zealand and Canadian judgments, in particular at appellate level, in which the relevance of ADHD to criminal offending has been evaluated. It notes the vulnerability of persons with ADHD in the context of being interviewed by police on suspicion of having committed criminal offences, it raises issues related to the fitness to stand trial of accused persons with ADHD and it identifies a need for forensic psychiatrists and psychologists to give particular attention in their reports and evidence to an assessment of the extent and nature of an offender's ADHD symptomatology and whether it played a causative or influential role in the person's engagement in criminal conduct, as well as to whether symptomatology is likely to be worsened by imprisonment or to render the offender especially vulnerable in a custodial environment.

Key words: ADHD; attention deficit; diagnosis; hyperactivity; moral culpability; sentencing; treatment.

'Let me see if Philip can
Be a little gentleman;
Let me see if he is able
To sit still for once at table':
Thus Papa bade Phil behave;
And Mamma looked very grave.
But fidgety Phil,
He won't sit still;
He wriggles,
And giggles,
And then, I declare,
Swings backwards and forwards,
And tilts up his chair,
Just like any rocking horse—
'Philip! I am getting cross!'
See the naughty, restless child
Growing still more rude and wild,
Till his chair falls over quite.
Philip screams with all his might,
Catches at the cloth, but then
That makes matters worse again.
Down upon the ground they fall,
Glasses, plates, knives, forks, and all.
How Mamma did fret and frown,

Correspondence: Ian Freckelton QC, Barrister, Crockett Chambers, Melbourne, Australia; University of Melbourne, Parkville, Australia. Email: I.Freckelton@vicbar.com.au
This article has been republished with minor changes. These changes do not impact the academic content of the article.

© 2020 The Australian and New Zealand Association of Psychiatry, Psychology and Law

When she saw them tumbling down!
And Papa made such a face!
Philip is in sad disgrace.

Dr Heinrich Hoffman, *Struwwelpeter: Merry Tales and Funny Pictures* (1844)[2]

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is the commonest neuropsychiatric disorder of childhood,[3] its most severe form, hyperkinesis,[4] having been asserted to affect about 1% of Western children.[5] In 2000, Wender contended that between 3% and 10% of school-age children and 4% to 5% of adults had ADHD.[6] More recently, the prevalence of ADHD has been estimated at between 3% and 7% of school-age children,[7] whereas worldwide prevalence rates in the general population have been identified as approximately 5.29% of children and 2.5% of adults meeting the diagnostic criteria for ADHD,[8] with persistence into adulthood at between 24.6% and 63% of affected women and men across ADHD categorisations. However, using standardised diagnostic criteria, there was no evidence that rates are increasing over time.[9] A United States study has noted that 1 in 13 parents with children aged between 3 and 17 have been informed that their children had ADHD.[10] Parent-reported prevalence of ADHD between children aged between 4 and 17 rose from 7.8% to 11% between 2003 and 2011.[11] The role of popular media in influencing parental views in this regard is uncertain.

Meta-analyses have concluded that ADHD is an important risk factor for overall delinquency[12] and that childhood ADHD has been associated with double the risk of arrest, over three times the risk of having convictions and almost three times the risk of a period of incarceration during adolescence or adulthood, compared to controls.[13] It appears that those with inattentive symptomatology are more likely than controls to commit most forms of criminal conduct, save perhaps robbery.[14]

Those with ADHD appear to be significantly over-represented amongst persons who come into contact with the criminal justice system. For instance, At Norrtälje Prison, Sweden, 315 male inmates were assessed for childhood ADHD by the Wender Utah Rating Scale (WURS-25) and for the presence of ADHD by the Adult ADHD Self-Report Screener (ASRS-Screener), with a response rate of 62%.The estimated prevalence of adult ADHD among longer-term inmates was 40%. Only 2 out of 30 prison inmates confirmed with ADHD had received a diagnosis of ADHD during childhood, despite the fact that most of them needed health services and educational support.[15]

A meta-analysis of 42 studies showed that 25.5% of the prison population met diagnostic criteria for ADHD, this constituting nothing short of multiples of the prevalence in the general population.[16] It is a very important finding.

There are indications too that the condition may be a predisposing factor for a significant incidence of recidivist commission of offences, especially by young persons.[17] In 2017, Cunial and Kebbell[18] published a study involving interviews with 46 Australian detectives, looking to understand police officers' ability to identify ADHD in children whom they interviewed. They found that detectives reported frequently encountering ADHD in interviewees and perceived such interviewees as being at a very significant future risk within the criminal justice system. Interestingly, assessors commonly view hyperactivity as a 'male' ADHD symptom and inattention as a 'female' ADHD symptom; it may be that this bias is interfering with accurate diagnoses of males who lack overt indicia of hyperactivity.[19]

The United Kingdom Youth Justice Centre ('the Centre') has argued that it is important for police to know whether a child has ADHD:

> This may affect how the police treat a child, how the police view the child's behaviour and whether the child gets a criminal record. Modifications (changes) can be made to

> how the police conduct a police interview. This can make it easier for a child with ADHD to answer questions and give their best evidence. An intermediary can be used to help with communication and a child must have an appropriate adult (see effective participation).
>
> If a child has ADHD and they are a witness or a victim, it is important to tell the police.[20]

Similarly, the Centre has pointed out that if a child has ADHD, straightforward procedural adjustments to standard procedure can assist the child to be able to participate effectively in court, for example, by provision for:

- regular breaks for movement and medication;
- opportunity to doodle, therapy cushion, use of a stress ball; and
- explaining that fidgeting is not a sign of disrespect.

> If the child is a defendant or witness, special measures can also be used. For example, use of an intermediary when preparing for giving evidence, to explain what is happening in court and to help with communication when giving evidence or other aids to communication. It is important that a child can effectively participate in the court process.[21]

In 2018 Nolte argued:

> Never has there been an opportunity like the one now present for Australia's legal community to set about creating a major paradigm shift in how the judiciary determines sentences and outcomes for those whose lives have been genuinely impacted by ADHD and now find themselves falling foul of the law.
>
> [U]nderstanding the issues of ADHD will create for [lawyers] opportunities to mitigate cases with greater efficiency and deliver the right outcomes that will see people receiving the appropriate care and treatment.
>
> ADHD is a condition that must be taken seriously, and lawyers must now begin to appreciate its legitimacy and existence.[22]

The diagnosis and treatment of ADHD have long been controversial.[23] So too is the issue of whether it is properly to be treated as mitigating of criminal culpability. Instancing the polarised views of the community about the condition, a magistrate in Ipswich, Queensland, in the context of sentencing a 29-year-old man charged with creating a public nuisance and obstructing police, is reported as stating that he had 'very little time for this ADHD nonsense. It's people trying to medicalise what 20 years ago was just an annoying kid'.[24]

An aspiration of this article is to provide information so as to reduce the incidence of uninformed drawing of inferences about ADHD in the forensic context, but also to add to the modest library of medico-legal literature on ADHD and the criminal law by identifying how the courts are factoring into their decisions contemporary knowledge about the symptomatology and potential treatment of ADHD. In turn this may assist expert witnesses to focus their evaluation most effectively so as to assist decisions as to both criminal responsibility and culpability by the courts.

A Short History of ADHD Diagnosis and Treatment

In 1798 the Scottish physician Sir Alexander Crichton[25] published *An Inquiry into the Nature and Origin of Mental Derangement: Comprehending a Concise System of the Physiology and Pathology of the Human Mind and a History of the Passions and their Effects*. He identified two forms of abnormal inattention as the opposition poles of pathologically increased or decreased 'sensibility of the nerves':

> The morbid alterations to which attention is subject, may all be reduced under the two following heads:

> First. The incapacity of attending with a necessary degree of constancy to any one object.
>
> Second. A total suspension of its effects on the brain.
>
> The incapacity of attending with a necessary degree of constancy to any one object, almost always arises from an unnatural or morbid sensibility of the nerves, by which means this faculty is incessantly withdrawn from one impression to another. It may be either born with a person, or it may be the effect of accidental diseases.
>
> When born with a person it becomes evident at a very early period of life, and has a very bad effect, inasmuch as it renders him incapable of attending with constancy to any one object of education. But it seldom is in so great a degree as totally to impede all instruction; and what is very fortunate, it is generally diminished with age.[26]

He observed that:

> In this disease of attention, if it can with propriety be called so, every impression seems to agitate the person, and gives him or her an unnatural degree of mental restlessness. People walking up and down the room, a slight noise in the same, the moving a table, the shutting a door suddenly, a slight excess of heat or of cold, too much light, or too little light, all destroy constant attention in such patients, inasmuch as it is easily excited by every impression. The barking of dogs, an ill-tuned organ, or the scolding of women, are sufficient to distract patients of this description to such a degree, as almost approaches to the nature of delirium. It gives them vertigo, and headache, and often excites such a degree of anger as borders on insanity. When people are affected in this manner, which they very frequently are, they have a particular name for the state of their nerves, which is expressive enough of their feelings. They say they have the fidgets.[27]

In the 1840s, symptoms of what we would today identify as ADHD were described by Heinrich Hoffmann, a physician who later founded the first hospital for mentally ill patients in Frankfurt. His descriptions were published in a children's book entitled *Struwwelpeter*, which he had designed for his three-year-old son, Carl Philipp. The symptomatology is depicted in the colourfully illustrated story of 'Zappel-Philipp' ('Fidgety Philip'), probably the first written mention of ADHD by a medical professional.[28]

In 1902, Sir George Still described symptoms of ADHD in 20 children whom he regarded as having a 'defect of moral control without general impairment of intellect and without physical disease'.[29] The male to female sex ratio was 3:1, and a number exhibited symptoms before the age of seven. He listed nine symptoms:

> (1) passionateness; (2) spitefulness – cruelty; (3) jealousy; (4) lawlessness; (5) dishonesty; (6) wanton mischievousness – destructiveness; (7) shamelessness – immodesty; (8) sexual immorality; and (9) viciousness. The keynote of these qualities is self-gratification, the immediate gratification of self without regard either to the good of others or to the larger and more remote good of self.[30]

By impulsivity, Still was referring to a 'quickness to display all emotion and especially those of frustration, anger, hostility, and aggression'[31]. He observed that many of his patients exhibited a 'quite abnormal incapacity for sustained attention. Both parents and school teachers have specially noted this feature in some of my cases as something unusual'.[32] He did not particularly refer to inattentive-impulsive children, but Rafalovich has observed that Still's lectures can be regarded as having laid 'the groundwork for a category of mental illness that is … specific to child deviance',[33] and Barkley[34] has described them as 'an historically significant moment for child psychopathology'.

In the aftermath of Still's analysis, the similarity between the symptoms of the children he described and persons with brain injuries was observed, leading to theories about their condition being caused by brain damage in infancy. An example of this diagnostic analysis was that of Laufer, Denhoff and Solomons in 1957:

> It has long been recognized and accepted that a persistent disturbance of behavior of a characteristic kind may be noted after severe head injury, epidemic encephalitis and communicable disease encephalopathies, such as measles, in children. It has often been observed that a behavior pattern of a similar nature may be found in children who present no clear-cut history of any of the classical causes mentioned. This pattern will henceforth be referred to as hyperkinetic impulse disorder. In brief summary, hyperactivity is the most striking item. This may be noted from early infancy on or not become prominent until five or six years of age. There are also a short attention span and poor powers of concentration, which are particularly noticeable under school conditions. Variability also is frequent, with the child being described as quite unpredictable and with wide fluctuations in performance. The child is impulsive and does things 'on the spur of the moment,' without apparent premeditation. Outstandingly also these children seem unable to tolerate any delay in gratification of their needs and demands. They are irritable and explosive, with low frustration tolerance.[35]

Earlier, though, during the 1930s, the German physicians, Franz Kramer and Hans Pollnow, described a 'hyperkinetic disease of infancy', with a marked motor restlessness unrelated to a post-encephalitic behaviour disorder which had been commonly identified in the preceding years.[36] They described children unable to stay still, running up and down a room, climbing on furniture, irritable when inhibited from acting on their impulses, touching everything around them without an apparent purpose, apparently being highly distractable, unstable in mood, including being excitable, prone to rage, aggression and tearfulness, and unable to concentrate on specific tasks, although paradoxically able to persevere at some activities of interest for extended periods of time. They emphasised the propensity of such children to be disobedient, to experience educational difficulties and to disturb other students at school. They regarded the symptoms as having implications into adulthood.

However, there is no shortage of high-profile individuals in adulthood who have achieved remarkably in spite of exhibiting at some stages of their life symptomatology of ADHD. It has been hypothesised for instance that luminaries such as Mozart, Beethoven, Leonardo da Vinci, Benjamin Franklin and Winston Churchill may have had ADHD.[37]

In 1937, Charles Bradley reported from a home for neurologically impaired children in Rhode Island in the United States a positive effect for the treatment of children with various behavioural disorders from treatment with stimulant medication.[38] His discovery was serendipitous, arising from treatment he provided to children with headaches in the aftermath of pneumoencephalograms administered in order to examine structural brain abnormalities. He observed that:

> It appears paradoxical that a drug known to be a stimulant should produce subdued behavior in half of the children. It should be borne in mind, however, that portions of the higher levels of the central nervous system have inhibition as their function, and that stimulation of these portions might indeed produce the clinical picture of reduced activity through increased voluntary control.[39]

He was later to conclude that the children most likely to benefit from benzedrine treatment were 'characterized by short attention span, dyscalculia, mood lability, hyperactivity, impulsiveness, and poor memory'.[40] The medication breakthrough for treatment of ADHD came in 1944 by Leandro Panizzon, when the drug that has become the treatment

of first choice for the condition, methylphenidate (marketed as Ritalin[41] by Ciba-Geigy Pharmaceutical Company from 1956), was synthesised – at first it was used for treatment of symptomatology of chronic fatigue, lethargy, depressive states, disturbed senile behaviour and psychoses associated with depression and narcolepsy.[42] However, in 1963, Leon Eisenberg and Keith Conners published an article that described the improvements made by treatment of disturbed children with the drug for behavioural symptoms from 'demanding' and 'disobedient' to 'leads into trouble' and 'lying'.[43] Conners, a psychologist at Johns Hopkins School of Medicine in the United States, later developed the 'Conners Comprehensive Behavior Rating Scale' (with a third version published in 2008)[44] to measure the severity of ADHD symptomatology, and also the therapeutic efficacy of stimulant medication on hyperactive children.[45]

As long ago as 2000, Wender made the claim that two-thirds of both children and adults respond positively to treatment with stimulant medications.[46] The therapeutic effect was summarised as follows by a psychiatrist in a case that went before the New Zealand Court of Appeal in 2005:

> His restlessness decreased significantly. He became calmer, polite, patient and able to pay attention. His eye contact and social skills improved substantially. He was also able to pay attention to conversations, allow others to finish and was more able to respond appropriately to the content of a conversation. He reported an increased ability to understand discussions as well as less distractibility; he characterised this as there being less 'white noise' in his immediate environment. He also reported that he was better able to pay attention to how he was thinking and feeling. He went from being barely able to tolerate a 15-minute interview to easily sitting still and talking for an hour or longer.[47]

A contrasting, albeit less prescribed drug used to treat ADHD is atomoxetine (marketed as Strattera), a selective norepinephrine reuptake inhibitor (SNRI), a drug developed by Eli Lilly to treat depression.[48] In the mid-1990s, a seven-week, placebo-controlled, double-blind, cross-over pilot study showed positive findings for treating patients with ADHD. An advantage of Atomoxetine is that it is not a stimulant.[49]

According to the 2018 NICE guidelines for management of ADHD in adults, medications should be considered as first-line treatment, with methylphenidate or lisdexamfetamine as the first choice, or atomoxetine if these cannot be tolerated or do not provide benefit.[50]

In Australia, the rate of treatment for ADHD has increased dramatically over time – for instance, from 0.9 per 100 children in 1987 to 3.4 per 100 children in 1997.[51] In 2002, over 4.2% of Australian children under the age of 18 were being prescribed stimulant medication, most of them for ADHD.[52] In that year, atomoxetine received Food and Drug Administration approval in the United States as an alternative medication for the condition and in 2004 by the Australian Food and Drug Administration.[53]

The DSM Definitions

In 1968, ADHD was first officially included by the American Psychiatric Association in its *Diagnostic and Statistical Manual of Mental Disorders* (DSM) as 'Hyperkinetic Reaction of Childhood' by *DSM-II*,[54] utilising a version of the terminology of Kramer and Pollnow, defined by being characterised by 'overactivity, restlessness, distractibility, and short attention span, especially in young children; the behavior usually diminishes by adolescence'. In the years leading up to the next edition of the DSM, the focus moved toward attention deficits in children, but an influential paper by Douglas in 1972 contended that deficits in sustained attention and impulse control were more significant features of the disorder than hyperactivity.[55] This played a role in the new formulation of the disorder in the 1980 *DSM-III*:[56]

'Attention Deficit Disorder (ADD)', which introduced criteria for age of onset, duration symptoms and exclusion of other aetiologies. The terminology was changed to 'ADHD' in 1987 in the *DSM-III-R*,[57] with the symptoms of inattention, impulsivity and hyperactivity being aggregated into a list of symptoms with a single cut-off score. The subtype 'ADD without hyperactivity' was removed and assigned to a residual category named 'undifferentiated ADD'.

By the time of the 1984 *DSM-IV*,[58] three types of ADHD were recognised: a predominantly inattentive type, a predominantly hyperactive-impulsive type and a combined type with symptoms of both dimensions.

Under the 2013 *DSM-5*[59] the diagnostic criteria for ADHD are:

A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterized by (1) and/or (2):

   1. **Inattention**: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or failure to understand tasks or instructions. For older adolescents and adults (age 17 and older), at least five symptoms are required.

1. Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).
2. Often has difficulty sustaining attention in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).
3. Often does not seem to listen when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).
4. Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).
5. Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).
6. Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).
7. Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
8. Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts).
9. Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

   2. **Hyperactivity and impulsivity**: Six (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:

Note: The symptoms are not solely a manifestation of oppositional behavior, defiance, hostility, or a failure to understand tasks or instructions. For older

adolescents and adults (age 17 and older), at least five symptoms are required.

a. Often fidgets with or taps hands or feet or squirms in seat.
b. Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
c. Often runs about or climbs in situations where it is inappropriate. (*Note:* In adolescents or adults, may be limited to feeling restless.)
d. Often unable to play or engage in leisure activities quietly.
e. Is often 'on the go,' acting as if 'driven by a motor' (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
f. Often talks excessively.
g. Often blurts out an answer before a question has been completed (e.g., completes people's sentences; cannot wait for turn in conversation).
h. Often has difficulty waiting his or her turn (e.g., while waiting in line).
i. Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

B. Several inattentive or hyperactive-impulsive symptoms were present prior to age 12 years.

C. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings (e.g., at home, school, or work; with friends or relatives; in other activities).

D. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning.

E. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder, personality disorder, substance intoxication or withdrawal).

The *DSM-5* revisions include modifications to each of the ADHD diagnostic criteria (A–E), a terminological change in the ADHD subtype nosology and the addition of two ADHD modifiers. Criterion A (ADHD symptoms) is unchanged from *DSM-IV* except for additional examples of how symptoms may manifest in adolescence and adulthood, and there is a reduction from six to five in the minimum number of symptoms in either symptom domain required for older adolescents and adults. Criterion B (age of onset) changed from 'onset of symptoms and impairments before age 7' to 'onset of symptoms before age 12'. Criterion C (pervasiveness) was changed from evidence of impairment to evidence of symptoms in two or more settings. Criterion D (impairment) requires that functional impairments only need to 'reduce the quality of social, academic or occupational functioning' instead of requiring that they be 'clinically significant'. Criterion E (exclusionary conditions) no longer includes Autism Spectrum Disorder as an exclusionary diagnosis. Regarding nosology, the *DSM-IV* ADHD 'types' are now referred to as 'presentations'. Hoffmanesque fidgeting remains as a diagnostic consideration. Finally, as elsewhere in the *DSM*, there is now an expectation that the patient's experience of the severity of the disorder (ie, mild, moderate or severe) will be specified.

It is important, including for forensic purposes, that ADHD is highly heterogeneous,

with those diagnosed differing considerably in behaviours, presence of comorbid diagnoses, developmental trajectories and treatment responsiveness.[60]

In 2009, Fletcher and Wolfe[61] usefully summarised the diverse adverse consequences of ADHD:

> The influence of ADHD on children occurs along several dimensions. Children with ADHD have been found to have fewer close friends and exhibit antisocial behavior. Poorer educational outcomes may be the most important economic consequence of ADHD. In particular, ADHD has been tied to poor concentration and impulsiveness during preschool, lower grades and greater retention and suspension, poorer perceptions by teachers and lower eventual educational attainment. Researchers have also found an increase in risky behaviors, including earlier sexual intercourse and lower rates of contraceptive use.

However, important work has been undertaken to understand better and more deeply the effects of ADHD. Multiple regions of the brain have been found to be associated with the pathophysiology of ADHD, with some demonstrating greater activation (such as the default mode network, somatomotor, visual) and others demonstrating reduced activation (such as frontoparietal, ventral attention, right somatomotor and putamen). Dysregulation of the frontal/subcortical/cerebellar catecholaminergic circuitry and abnormalities in the dopamine transporter system are fundamental to the pathophysiology of ADHD. Cortese and others demonstrated that a pattern of hypoactivated frontoparietal functioning persists into adulthood.[62]

Assessments of executive function in persons with ADHD have shown pervasive dysfunction as well as deficits in cognitive control.[63] Evaluations have also highlighted estimates of the prevalence of working memory deficits among elementary-aged youth with ADHD ranging from 30.1% to 98%.[64] Less is known about this issue in relation to older persons with ADHD, but research utilising fMRI may shed further light on the relationship between working memory and ADHD. Another area deserving of further research is the role of impaired reward processing and ADHD. As Musser and Raiker have observed:

> ADHD has been repeatedly demonstrated to be associated with a preference for small immediate over larger delayed rewards, as well as steepened discounting function when anticipating future rewards. This has been supported via performance on laboratory and computerized tasks. For example, meta-analytic work has demonstrated medium associations between ADHD and delay aversion (r=0.38) among preschool-age youth.[65]

ADHD is nearly three times as commonly diagnosed in boys as in girls[66] but the explanation for the differential is not fully understood:

> There are many theories as to why ADHD is more commonly diagnosed in boys than girls. One possibility is that girls are in some way 'protected' from developing ADHD, and so it takes a higher burden of risk factors than in boys for girls to develop problems. Another possibility is that ADHD symptoms are missed in girls or that mental health problems in girls develop into problems other than ADHD.[67]

An important characteristic of ADHD is anosognosia – the lack of awareness on the part of many with the condition that they have its symptoms and limitations. A theory in this regard is that this is associated with reduced conscious perception of errors and limitations.[68] The reality of the anosognosia in respect of ADHD has ongoing forensic ramifications because of the fact that not only is the diagnosis often missed by mental health practitioners, but those with it are unaware of it, including when charged, resulting in the need on occasion to attempt to adduce new evidence on appeal of not just the disorder but its potential impact upon criminal culpability.

Definitive biomarkers have not yet been identified for ADHD, leaving diagnosis essentially to be made on the basis of behaviour.[69] The aetiology of ADHD is not straightforward, although heritability plays a major role and is regarded as reflecting genetic factors and environmental influences, as well as their interplay.[70]

Comorbidity

Comorbidity with ADHD, especially with other neurodevelopmental disorders, is the rule rather than exception.[71] Other relevant diagnoses include:

- conduct disorder;[72]
- learning disability or intellectual disability;[73]
- oppositional defiant disorder;[74]
- Tourette's syndrome;[75]
- Depression;[76]
- anxiety disorders;[77]
- hypersexuality;[78]
- sleep disorders;
- language disorder (formerly mixed receptive expressive language disorder);[79]
- dyslexia;[80]
- obsessive compulsive disorder;[81]
- personality disorders;[82]
- anxiety disorder;[83]
- post-traumatic stress disorder;[84]
- autism spectrum disorder/Asperger's disorder;[85] and
- foetal alcohol spectrum disorders.[86]

A particular overlap can be observed between ADHD and mild cognitive impairment.[87]

Di Nicola and others[88] hypothesised the co-occurrence of ADHD in patients with bipolar disorder (15% in their sample) or major depressive disorder (7.5% in their sample) to be associated with maladaptive personality traits, such as neuroticism, conscientiousness and extraversion plus worse clinical characteristics, outcome and level of functioning.

In a study of 2881 children and adolescents (aged 5–17 years), 67% met the diagnostic criteria for ADHD; 650 (34%) had only ADHD, and 1269 (66%) had at least one comorbid psychiatric disorder (learning disorders: 56%; sleep disorders: 23%; oppositional defiant disorder: 20%; anxiety disorders: 12%).[89] Patients with ADHD of combined type and with severe impairment were more likely to present with comorbidity.

Another phenomenon that has been observed in the criminal offending context is the potential for some offenders with ADHD to self-medicate with a variety of illegal stimulants, including methylamphetamine.[90]

Case Law

In a series of judgments by the Court of Appeal for England and Wales, the potential relevance of ADHD for sentencing has been accepted. In addition, important guidance has been provided by the Western Australian decision of *Paparone v The Queen*, and the New Zealand Court of Appeal decision of *H v The Queen* has highlighted limitations in terms of inferences that are to be drawn from no more than reference to the existence of ADHD in an offender. While the criminal law cases referred to hereunder are far from an exhaustive catalogue of key judgments in which ADHD has been identified as an important factor, the judgments cited are all appellate authorities and provide a useful insight into the approach of the courts on a number of the forensic issues that have been traversed in recent years in relation to ADHD and the criminal law.

R v *F*riend

In *R v Friend*,[91] the Criminal Cases Review Commission (CRCC)[92] referred to the Court of Appeal the conviction of Billy Joe Friend for murder and his sentence to detention during Her Majesty's Pleasure under section 53(1) of the *Children and Young Persons Act 1933* (Eng & Wales). Friend did not give

evidence at his trial. At the time of his conduct he was aged 14[93] and at trial he was 15. During the initial hearing in 1996 before the Central Criminal Court, Dr (later Professor) Gudjonsson gave evidence on a voir dire about the mental state of Friend and his ability to give evidence in his own defence. It was argued on Friend's behalf that no adverse inference should have been drawn from his having failed to give evidence.

According to Dr Gudjonsson, if Friend was allowed plenty of time and if he could be induced to settle down and concentrate, he was capable of providing a coherent account, although he would find it more difficult to listen to questions and to concentrate if he was under stress. Dr Gudjonsson expressed concern about whether Friend could do justice to himself. His distractibility would be a concern. He would not have the same intellectual resources as others. He contended that it was necessary to take an overall view of Friend's ability to concentrate.

However, the trial judge said that it appeared to him that Friend had given a very coherent, even though in certain respects not true, account of what had happened in answers in an interview with police. He took into account that Dr Gudjonsson had said that he was not a very suggestible young man. At the time the power to draw inferences in relation to a failure to give evidence applied only to those of age 14 or over, but the judge took the view that that applied to calendar age and not to mental age. The trial judge concluded that on balance Friend's mental condition was not such as to make it undesirable for him to give evidence. He based his conclusion, amongst other things, on the explanation given by Friend in interview as well as to Dr Gudjonsson when seen by him, and on the powers of the court to ensure a witness was not put under any undue pressure.

Before the Court of Appeal, the appellant placed reliance upon reports from an expert in adolescent psychiatry, Dr Susan Bailey, obtained by the CRCC, and a report obtained subsequently by the Crown from Dr Susan Young of the Maudsley. Dr Bailey expressed the view that Friend had features of ADHD. She expressed the opinion that, although he had been just fit to plead, Friend did not have the cognitive or psychological function or capacity to participate effectively in the trial as a result of, firstly, his level of mental impairment; secondly, inattentiveness and lack of ability to concentrate; and thirdly, his emotional state. Thus, it had been undesirable for him to give evidence. Further, she expressed the view that in any event a less emotive setting could have been arranged, such as involving a separate trial or a video link. She said Friend's functional capacities were such that he could only have comprehended simple questions with one concept within a question and that he would have been unlikely to remember earlier answers while giving evidence at trial.

When contacted in relation to the report of Dr Bailey, Dr Gudjonsson said he observed that he had not specifically stated originally that it would be undesirable for Friend to give evidence because he thought that that was an (ultimate) issue for the court to determine.[94] He conceded that if Friend met the criteria for ADHD at the time of his trial then this might have strengthened the arguments that it had been undesirable for adverse inferences to be drawn due to his not giving evidence at his trial. Dr Bailey then saw Friend, and after reviewing Friend's account of his early life, his understanding of the offences, the trial process, sentencing and life at Glenthorne Youth Treatment Centre which he had attended, she expressed the view that the information obtained confirmed her prior opinions that he could not effectively have participated in the trial.

Before the Court of Appeal, the evidence from Dr Young was important. She identified as the core symptoms of ADHD inattention, impulsiveness and hyperactivity. She estimated that:

> 3–5% of the childhood population has ADHD and symptoms generally gradually

> remit as they mature. Nevertheless, up to two-thirds of ADHD children will continue to have residual symptoms in young adulthood and it is estimated the disorder is present in about 1–3% of adults or one in every 35 people. Some adults continue to be symptomatic in their 40s or even 50s.[95]

She noted that:

> ADHD is … strongly associated with specific learning problems, problems in employment and instability in relationships. Around one-third of ADHD children are subject to a Statement of Special Educational Needs and either receive additional support to cope in mainstream education or referred to special school due to their learning and/or behaviour problems. Comorbid problems are commonly reported including conduct disorder (50%), depression (70%), anxiety (25%) and personality disorder (30%). … [A] sizeable subgroup misuse drugs and engage in criminal behaviour.[96]

Dr Bailey emphasised that:

> Because of their cognitive deficits, individuals [with ADHD] are predisposed towards poor impulse control, an attention deficit and a desire for immediate gratification without consideration for the consequences. There is a significant risk for anti-social outcomes, including criminal behaviour, disinhibited and aggressive behaviour. In addition to these behavioural problems, they suffer a range of neurocognitive impairments, including attentional, executive (ie poor planning, sequencing and organisational ability) and memory dysfunction. Although these deficits appear widespread, it is thought that their neuropsychological basis involves dysfunction in working memory, the self regulation of cognition and future directed behaviour.[97]

Bailey concluded that the residual symptoms of attention and impulsivity fell within a level of significant impairment and at the time of Friend's trial would have been 'considerably more prevalent and severe'. She also concluded that his scores for intellectual deficit would have been accentuated by his inability to concentrate consequent upon his ADHD and his anxiety. She expressed the view that:

> The implication of having ADHD and significant cognitive impairments of this type means that Mr Friend would have had difficulty sustaining attention over a prolonged period, he would have become easily distracted and his mind may have wandered onto different and/or irrelevant topics. His verbal deficits meant that he was disadvantaged in terms of his understanding of what was being said (ie not understanding the meaning of some of the words used) but his ADHD cognitive deficits meant that he may have completely missed some parts of the process (eg by going off task, ie not listening or 'tuning out'). When I interviewed Mr Friend he described this to be the case saying that he did not understand what was being talked about and at times his mind wandered onto other topics such as thinking about a football game. … Aside from having difficulty following the proceedings, it is unlikely that Mr Friend would have coped satisfactorily with giving evidence for prolonged periods in the witness box. Although his poor attentional control was considered at the time, the implication of his impulsivity or difficulty inhibiting an immediate (and perhaps inappropriate) response was not. This latter point would have particular relevance as to whether it was desirable for Billy Joe Friend to give evidence. For example, aside from concentration problems in the witness box causing him to lose his train of thought, Mr Friend may have blurted out the first thing that came to mind. He may have been inconsistent and given conflicting evidence. People with ADHD often speak and act without thinking of the consequences. He may have become emotionally labile, distressed and/or angry when giving evidence. He may not have been able to inhibit a verbally aggressive response. These vulnerabilities are likely to be misinterpreted by a jury.[98]

Her opinion was that at the time of his trial Friend was hampered by:

a. severe cognitive deficits associated with ADHD in attention and impulsivity;
b. poor behavioural controls (hyperactivity, restlessness, emotional liability);
c. verbal intellectual deficits;
d. deficits in short-term verbal memory;
e. anxiety;
f. his young age; and
g. no concessions made at trial.

The Court of Appeal unanimously permitted the fresh evidence and concluded that Friend's conviction could no longer be regarded as safe:

> It is clear that the judge would not have ruled in favour of drawing any adverse inference, certainly in respect of the failure to give evidence, and we think probably also in respect of the interview or silence at the first interview in so far as he did direct the jury that they might do so. Indeed, the Crown has conceded that it would not even have invited any adverse inference as regards the failure to give evidence.
>
> Even if there had been any direction regarding an adverse inference, the judge would still have had to direct the jury with reference to the new evidence and in any event, and quite apart from these points, he would in the light of the new evidence certainly have directed the jury in quite different terms as regards any inference from silence or lies told in interviews.[99]

In what constitutes one of the most important legal precedents about the relevance of ADHD for the operation of the criminal law, the court allowed the appeal and quashed Friend's conviction.

R v Osborne

In *R v Osborne*[100] the Court of Appeal heard another referral from the CRCC, this time in relation to Osborne's 2005 conviction for murder (committed when he was aged 14) and detention for life with a minimum term assessed at nine years. At trial, Osborne unsuccessfully pleaded not guilty on the ground of self-defence and at sentencing did not rely on any mental health expert evidence.

On appeal, fresh evidence was submitted on the issue of whether Osborne at the relevant time suffered from ADHD, the prominent feature of which was impulsiveness constituting an abnormality of mind which substantially impaired his ability to form a rational judgment and exercise control over his actions when he struck the deceased, thereby affording him a defence of diminished responsibility and supporting the defence argument that he lacked the necessary intent for murder.

The fresh evidence from two psychiatrists and a psychologist addressed the likelihood of Osborne having experienced the symptoms of ADHD at the relevant time. The court was pointed in rejecting criticism that the argument of ADHD was not advanced at the time, identifying no error in the omission.

The forensic psychiatrist, Dr Cleary, identified a triad of relevant ADHD symptoms in Osborne: inattention, hyperactivity and impulsivity, the last being the most relevant and being much greater than would normally be expected in a child of 14 years. However, he conceded that Osborne's use of three joints of 'skunk' would have had an intoxicating and disinhibiting effect on him and would have been likely to have reduced his ability to control his impulses. The court expressed reservations about the psychologist, Mrs Stevens, finding her to be overly prepared to work on the basis of Osborne's own descriptions of his behavioural difficulties and to set aside favourable descriptions of Osborne from those who had educated him. The psychiatrist, Dr Browne, who was called by the Crown, did not personally support the diagnosis of ADHD but was prepared to defer to the diagnostic opinion of Dr Cleary. However, he expressed strong reservations about the seriousness of Osborne's symptomatology.

The Court of Appeal took into account the effects of Osborne's consumption of cannabis,

the racism in his attack on the deceased, the lack of apparent impulsivity in his attack and the deliberateness in his assault.[101] In these circumstances, it concluded that the level of Osborne's ADHD, putting it as high as it could, did not substantially impair his mental responsibility for his actions at the time of the killing: 'There is clear evidence of calculation and deliberation. He knew exactly what he was doing, and why he was doing it. No jury properly exercising its responsibilities could have concluded that diminished responsibility was established on the basis of the appellant's ADHD'.[102]

Ibrahim v the Queen

In *Ibrahim v The Queen*,[103] the Court of Appeal heard an appeal against a trial judge's decision to decline to admit expert evidence concerning the effects of ADHD on a not guilty plea by Ibrahim to causing grievous bodily harm to a family member with whom he had a history of bad relations. At the commencement of his trial, an attempt was made to adduce expert evidence from a psychiatrist about the effects of ADHD. However, the author had not met Ibrahim so he was reporting on what he had read and had been told, and some of the comments made by him were found to have been based on misunderstandings of what had happened and what the defence was. The trial judge gave three reasons for disallowing the application to admit the expert evidence:

> The first reason was that the application was being made far too late in the proceedings without any proper explanation. The second reason was that it was very unsatisfactory to admit expert evidence from a medical expert who had not interviewed or met the defendant. The third reason was that the report was inappropriate because it was not relevant to the issues in the case. After the recorder had so ruled the trial proceeded.[104]

The Court of Appeal found the psychiatrist's speculation about what Ibrahim was thinking and why he acted as he did 'of no great assistance. He never met the appellant and misunderstood the factual basis of the appellant's defence'. The key issue in the trial was as to who struck the first blow. The prosecution evidence, supported by CCTV footage, was that Ibrahim was waiting for the victim and struck the first blow. This was not an issue on which the psychiatrist's evidence had the potential to provide assistance. The Court of Appeal found that the expert opinions 'could only have provided slender assistance to the appellant at best'.[105] Thus it found no error in the decision at trial and dismissed the appeal.

Paparone v the Queen

The decision of the Western Australian Court of Appeal in *Paparone v The Queen*[106] in 2000 is Australia's leading decision on the relevance of ADHD for sentencing. Paparone was sentenced by the District Court at Perth to an effective term of 5.5 years' imprisonment and a fine of $750 for various drug offences, including manufacturing amphetamines. At the appellate hearing, the main ground pursued was that the sentencing judge had not accepted that an attention deficit disorder (ADD) had been the real cause of Paparone's offending and should be treated as a mitigating factor. Paparone had asserted that his ADD had resulted in his taking drugs on a self-help basis for the purpose of alleviating his disorder and that this had resulted in the circumstances leading to the offences. The sentencing judge had said that he was not able to make a finding of fact on the matter and that while the disorder was not in dispute, it had no necessary connection with the manufacture or possession of illicit drugs. He observed that many people with the disorder had no connection with the drug trade at all.

A psychologist, Ms Coxon, gave evidence for Paparone that often ADHD sufferers self-medicate with a variety of substances in order to be able to function normally in society and that it seemed that in a bid to get rid of the boredom and to get things done Paparone had

turned to illicit drugs. He had initially experimented with a friend's prescribed medication for ADHD and found that this made his life more manageable and that he performed more efficiently at work. Paparone asserted that this led him to attempt to make his own variety of amphetamine from a recipe he discovered on the Internet.

A psychiatrist, Dr Srna, conducted three interviews with Paparone and arranged for electroencephalographic recording, axial tomography of the brain and relevant blood tests. He also arranged a urine toxicology screen for alcohol, illicit substances and substances of abuse.

Paparone told Dr Srna that one of his friends had been diagnosed with ADD and had been taking stimulants prescribed for him by his psychiatrist. Paparone said he had accepted several stimulant tablets from his friend. Within a short time he had felt significantly better, with his self-esteem and concentration improving. Instead of seeking expert help, he had embarked upon the use of amphetamines and cocaine. He had initially benefited from using these, but later the effect had worn off and the whole exercise had become very expensive. He had been buying methylamphetamine from drug dealers. He said that guilt had been nagging at him all the time and he had started to become depressed. In order to save money and benefit from the methylamphetamine, he had started to manufacture it at home, using 3–4 grams per week, which occasionally increased to 7 grams per week. However, when he had tried to get off the substance he had started to experience withdrawal symptoms and severe depressive symptoms.

The psychiatrist noted that the psychologist had found many significant clinical factors which were of concern, including areas of obsession with ill-health, feelings of guilt, self-criticism, uselessness and thoughts of being persecuted by others. There had also been evidence of Paparone feeling out of touch with reality and being 'obsessive compulsive', with thoughts of self-destruction and evidence of low energy and depression. There had been a disorganised thought process and a moderately high level of anxiety. The psychologist thought that Paparone had scored 'high' on all ADD and ADHD scales and had concluded that he clearly fitted the ADHD criteria, particularly in respect of hypersensitivity.

On examination, the psychiatrist had found that Paparone was 'accelerated and pressured'. He had shown foreclosure of thought and significant impulsivity in the interview. He had expressed paranoid beliefs about certain people and situations, but these had not been of a bizarre nature. Dr Srna made a diagnosis of an early stage of amphetamine-induced psychotic disorder with delusions in a young man with ADD which had gradually developed from childhood attention deficit/hyperactivity disorder, combined type (ADHD). An additional diagnosis, instancing another aspect of the complexity of comorbidities in respect of ADHD, was made of amphetamine dependence due to self-treatment of ADHD symptoms. Dr Srna concluded:

> I see Mr Paparone's alleged offence as directly linked to him seeking relief from symptoms of attention deficit disorder which he has been suffering from since his childhood. The disorder seems to have been interfering with his overall functioning and performance and upon experimentation with prescription stimulants he turned to illicit stimulants instead. Sufferers from ADHD tend to act in an impulsive and often self-damaging manner which has resulted in Mr Paparone's case in his dependence upon illicit stimulants. His obsessional personality and associated depression further complicated the matter. At the time of his presentation he was clearly suffering from a mild psychotic state related to excessive use of stimulants.[107]

He proffered the view that the effect of imprisonment would be 'counter-productive and damaging' for Paparone.

The decision in the Western Australian Court of Appeal was split. Kennedy and

Murray JJ dismissed the appeal and summed up the law as follows:

> The presence in the offender of [mental health] conditions … will be relevant to the sentencing process in a number of different ways and for different reasons where there is a causal connection or link of a relevant kind established between the condition of the offender and the commission of the crimes for which he or she is to be sentenced. Generally speaking, where that is the case, the effect of the condition or disorder will be mitigatory, but that will not always be the case and indeed in some circumstances the effect may be one of aggravation, eg, where an intractable condition related to the offending behaviour leads to the conclusion that the offender will represent in the future a continuing danger to the community by reason of the commission of further offences. Such a condition may have an impact upon the type of disposition chosen and its severity.
>
> Where it is advanced that an offender suffers from a condition or disability which should mitigate punishment, then as I have mentioned, it will be necessary to demonstrate a causal relationship between the offending and the condition, as I put it in *CW*, 'at least in the sense that as a result of the intellectual deficit the offender was not inhibited from committing the offence or offences in question.' In such a case the mitigation may be found in the conclusion that the offender's moral culpability, as opposed to his or her criminal responsibility, has been lessened so as to reduce the seriousness of the offending and the need for a denunciatory sentence.
>
> Alternatively, or perhaps in addition to that factor, the offence and the offender may be seen to provide inappropriate vehicles for general and particular deterrence to be given their full weight. The extent to which such factors should be given weight will be a matter of degree depending upon the particular circumstances of the case in point, but it will often be the case, as Kennedy J put it in *Dalgety*, that such considerations of deterrence will continue to operate 'sensibly moderated'. Only in an extreme case will the relevance of such considerations be eliminated entirely.[108]

They accepted that where a sentence which would otherwise be proportionate to the criminality involved may have a more severe impact upon the particular offender than upon others, then the court will be led in mercy, as well as by reason of the application of the general principles of sentencing, to moderate the punishment or choose an alternative disposition.[109] In applying the general considerations to the appeal by Paparone, they concluded that the sentencing Judge's conclusion was correct:

> There was no causal link of the required kind between the applicant's attention deficit disorder and his offending behaviour. He did not commence to manufacture, consume and sell amphetamines because he suffered from the disorder, but by reason of his deliberate choice, initially taken to obtain relief from the symptoms of the disorder. There was never any suggestion that the disorder precluded him from seeking treatment and the prescription of appropriate medication. No doubt the fact that he suffered from the disorder provides some explanation for his commission of the offences, but it does not in my opinion in any way mitigate punishment.[110]

Thus, they rejected the appeal.

By contrast, Wallwork J in dissent concluded that:

> [I]t is clear that the learned Judge was not satisfied on the balance of probabilities that the applicant's offences were connected to a significant extent to the ADHD problem. However a question arises as to whether his Honour adequately and correctly dealt with the submission which had been made to him on that aspect. … [T]he learned Judge erred when he stated that the medical diagnosis had no necessary connection with the manufacture or the possession of the drugs. The word 'necessary' indicates

> that his Honour was apparently not applying the correct standard of proof.[111]

H v the Queen

In *H v The Queen*,[112] the New Zealand Court of Appeal heard an important appeal in a case where H had been found guilty by a jury at trial of three counts of indecent assault on a young person, his 12-year-old niece, one of which was representative, and one count of sexual violation by unlawful sexual connection. The issue on appeal was whether the trial judge had erred in ruling as admissible questions posed by the prosecutor about H's ADHD. H argued that the evidence elicited by the prosecution was unfairly prejudicial and had resulted in a miscarriage of justice.

At trial in evidence the complainant's mother, in answer to a question from the jury, said in respect of a complaint that H had been jumping on her in her bed, 'But [H] has got ADHD as well so I sort of thought … he was always kind of, a little bit, he a little bit childish'.[113] In later evidence, H conceded he had ADHD, and the cross-examination by the prosecutor continued:

> Q: Do you take medication for ADHD, [H]?
>
> A: I don't need to, no, but I do, yes.
>
> Q: And that medication that you do take is designed to suppress some of the behaviours of ADHD?
>
> A: No, it's designed to help me focus on a task that I'm trying to do.
>
> Q: Would you agree that when you are not on your medication some of your behaviour can be quite childish?
>
> A: No.

The trial judge permitted the evidence on the basis that the prosecution was entitled to explore the answers given by H as to the state of his ADHD and whether he needed medication to control his symptoms. The prosecutor then asked H a series of questions seeking to establish that H's behaviour would become 'quite childlike', 'unfocussed', 'a little bit impulsive' and 'physically a bit fidgety' when he was not medicated. Further, the proposition was put to H that he had a history of not taking his medication on his days off work. H rejected all of these propositions.[114] H's ADHD was referred to only in passing by the prosecution in its address to the jury.

The Court of Appeal rejected the appeal by H although it accepted that the questioning of H about his being on ADHD medication had 'potentially sinister overtones', as did the questions about H's stopping his medication. It noted that there was a risk that the jury would accept by implication that H was suffering from a medical condition, the nature of which had not been explained by reference to expert evidence. However, the Court of Appeal held that the critical issue was whether cross-examination crossed the line to which it might have been unfairly prejudicial in the case against H:

> [I]t was not relied upon in support of any of the key aspects of the Crown's case in closing. The passing reference to the impugned evidence by the prosecutor in the context of summarising the evidence given by the complainant's mother could not be said to have involved unfair prejudice. The fact that it was not relied upon by the Crown, not addressed by the defence and not referred to by the Judge in summing up demonstrated that it was not part of the central Crown case, nor did form part of the issues the jury had to decide.[115]

Diagnostic Issues for Mental Health Practitioners

It remains common for expert evidence about ADHD symptomatology in offenders, both young and adult, not to be placed before courts because the condition has not been diagnosed.

Diagnosis of ADHD, along with diagnosis of common comorbidities, is an area of expertise for both psychiatrists and psychologists that requires clinical knowledge not possessed by all mental health practitioners and, in particular, by all forensic mental health practitioners.

A particular issue has been held to exist, at least in some jurisdictions, in respect of psychologists' entitlement to diagnose. Somewhat surprisingly, in the United Kingdom and at least in parts of Australia, this remains unresolved.[116] Wood J, in *R v Peisley*[117] in the New South Wales Court of Criminal Appeal, commented:

> I consider it necessary to observe once again that it is important that clinical psychologists do not cross the barrier of their expertise. It is appropriate for persons trained in the field of clinical psychology to give evidence of the results of psychometric and other psychological testing, and to explain the relevance of those results, and their significance so far as they reveal or support the existence of brain damage or other recognised mental states or disorders. It is not, however, appropriate for them to enter into the field of psychiatry.[118]

In *WW v The Queen*[119] the New South Wales Court of Appeal applied the *Peisley* passage specifically to the diagnosis of ADHD, observing:

> It was open to Mr Mahoney [a psychologist] to test the applicant for indications that at the time of testing he was suffering from ADHD. He could describe the characteristics of the condition of ADHD. What he could not do as a psychologist was to express an opinion as to whether and to what extent the ADHD condition affected the applicant at the time of the offence.[120]

Concluding Observations

It is very important that the current indications are that there is a major over-representation of persons with ADHD in the prison population. Impulsive, inattentiveness to instructions, inability to retain information and limitations to the ability to think rationally through the likely consequences of actions are all criminogenic factors. Such characteristics can have a variety of causes: mental illness, brain injury, intellectual disability, personality disorders, autism spectrum disorder, foetal alcohol spectrum disorders, to name but some. ADHD is another and can be crucial both to explaining and contextualising engagement in criminal activity, but also in predicting the likelihood of recidivism by an offender.

The diagnosis on its own of ADHD in an offender will not provide either a defence or, necessarily, a significant mitigation of culpability;[121] it depends on the nature of the symptoms experienced by the accused person, the conduct engaged in, and the extent to which the symptoms played a precipitating role in the conduct. However, ADHD does have the potential to be relevant to fitness to stand trial[122] and to the partial defence of diminished responsibility, in jurisdictions where that exists. It can also have a variety of other explanatory applications in respect of the voluntariness of police interviews, the circumstances in which a person does not give evidence and potentially to explain unusual conduct in court, which otherwise might be misinterpreted.[123] Most particularly, it is relevant during the sentencing phase, including that it may result in the offender experiencing difficulties, while untreated, with self-regulation and impulsivity,[124] and in the offender finding 'prison life more difficult than prisoners who do not share his condition'.[125] It has the potential to explain some of the context in which a person exercised problematic judgment or engaged in antisocial behaviour.

Often ADHD will be found to exist in conjunction with other conditions, both in respect of young offenders and those who are adults. This has the potential to make disaggregation of the contributing elements of comorbidities difficult for forensic practitioners and also to

give limited assistance to offenders, as conditions such as ADHD can persist and provide cause for judicial disquiet about the potential for recidivism.

However, two factors are relevant in this regard: many young persons diagnosed with ADHD do not continue to experience its symptoms into adulthood,[126] and if an offender is prepared to be adherent to medication to treat ADHD, this may substantially reduce symptomatology and the likelihood of ongoing commission of criminal offences. Marcotte and others in 2009 carried out a statistical regression analysis between crime rates and the prescription rates for stimulants used to treat ADHD in the United States between 1997 and 2004. They found that for every 1% increase in stimulant prescription there was a 0.129% decrease in violent crimes; put another way there was an inverse correlation.[127]

A 2012 Swedish study gathered information on 25,656 patients with a diagnosis of ADHD, their pharmacologic treatment and subsequent criminal convictions in Sweden between 2006 and 2009. As compared with non-medication periods, among patients receiving ADHD medication, there was a significant reduction of 32% in the criminality rate for men and 41% for women. The rate reduction remained between 17% and 46% in sensitivity analyses among men, with factors that included different types of drugs (eg, stimulant vs non-stimulant) and outcomes (eg, type of crime). The authors concluded that: 'These findings raise the possibility that the use of medication reduces the risk of criminality among patients with ADHD'. However, of course, prescription of a drug which has the potential for misuse and diversion, because of its amphetamine content,[128] poses its own issues, making atomoxetine a potentially attractive treatment alternative.

Without expert evidence about the ramifications of ADHD for an offender's criminal conduct, it will generally not be accorded particular significance at sentencing.[129] For the opinions of mental health practitioners about persons having ADHD to be considered helpful by the courts, though, expert witnesses will generally both need to have the requisite diagnostic expertise and to have examined the individual.[130] Care needs to be taken not to be overly influenced by patients' self-reports[131] or by accounts from parents. Critical clinical judgment needs to be exercised. If an offender has also taken illegal drugs which may have played a role in generating disinhibition, this will tend to render a diagnosis of ADHD less valuable in mitigation.[132]

A key issue is the extent to which the symptomatology of ADHD played a causative or at least contributing role to the commission of a criminal offence.[133] If there is clear evidence of premeditation and planning, that will go a considerable distance to negating the relevance of an ADHD diagnosis.[134] A subsidiary consideration at sentencing should also be the extent to which symptomatology of ADHD may be exacerbated by the custodial environment or may make the person particularly vulnerable to maltreatment by others.

Ethical standards

Declaration of conflicts of interest

Ian Freckelton has declared no conflicts of interest

ORCID

Ian Freckelton http://orcid.org/0000-0001-7509-6375

Notes

1. An earlier version of this article was presented as a paper to the conference of the Royal Australian and New Zealand College of Psychiatrists and the Australian and New Zealand Association of Psychiatry, Psychology and Law, 'Collaboration and Challenges Across the Global South', Singapore, November 2019. The author acknowledges the helpful suggestions and comments on an earlier draft of the paper by Dr Robert Adler, Dr David List and Dr Patricia Molloy.

2. <http://www.gutenberg.org/files/12116/12116-h/12116-h.htm>
3. See DM Foreman, 'Attention Deficit Hyperactivity Disorder: Legal and Ethical Aspects' (2006) 91(2) Arch Dis Child 192.
4. See EW Neill Hobhouse, 'The Differentiation of Hyperkinesis in Children' (1928) 211(5466) The Lancet 1112; P Conrad, 'The Discovery of Hyperkinesis: Notes on the Medicalization of Deviant Behavior' (1975) 23(1) Social Problems 12; MW Laufer, 'Hyperkinetic Behavior Syndrome in Children' (1956) 50(4) Journal of Pediatrics 463; RB Kugel, 'The Diagnosis of Attention Deficit Disorder (Hyperkinesis) in Children' (1981) 20(2) Journal of the American Academy of Child and Adolescent Psychiatry 376.
5. See H Leltzer and others, 'Mental Health of Children and Adolescents in Great Britain' (2003) 15 International Review of Psychiatry 185.
6. PH Wender, *ADHD: Attention-deficit Hyperactivity Disorder in Children, Adolescents, and Adults* (OUP 2000) 4.
7. See JL Ebejer and others, 'Attention Deficit Hyperactivity Disorder in Australian Adults: Prevalence, Persistence, Conduct Problems and Disadvantage' (2012) 7(10) PLoS One e47404.
8. See G Polanczyk and others, 'The Worldwide Prevalence of ADHD: A Systematic Review and Metaregression Analysis' (2007) 164(6) American Journal of Psychiatry 942; V Simon and others, 'Prevalence and Correlates of Adult Attention-deficit Hyperactivity Disorder' (2009) 194(3) British Journal of Psychiatry 204.
9. GV Polanczyk and others, 'ADHD Prevalence Estimates Across Three Decades: An Updated Systematic Review and Meta-Regression Analysis' (2014) 43(2) International Journal of Epidemiology 434.
10. See J Fletcher and B Wolfe, 'Long-term Consequences of Childhood ADHD on Criminal Activities' (2012) 12 J Ment Health Policy Econ 119; GV von Polier, TD Vloet and B Herpertz-Dahlmann, 'ADHD and Delinquency – A Developmental Perspective' (2012) 30(2) Behavioral Science and the Law 121; MH Sibley and others, 'The Delinquency Outcomes of Boys with ADHD and Without Comorbidity' (2011) 39(1) Journal of Abnormal Child Psychology 21.
11. See BD Fulton, 'State Variation in Increased ADHD Prevalence: Links of NCLB School Accountability and State Medication Laws' (2015) 66(10) Psychiatric Services 1074; Polanczyk and others, 'ADHD Prevalence Estimates' (n 9) 434, doi: 10.1093/ije/dyt261
12. See TC Pratt and others, 'The Relationship of Attention Deficit Hyperactivity Disorder to Crime and Delinquency: A Meta-Analysis' (2002) 4 International Journal of Police Science and Management 344.
13. C Mohr-Jensen and HC Steinhausen, 'A Meta-Analysis and Systematic Review of the Risks Associated with Childhood Attention-Deficit Hyperactivity Disorder on Long-term Outcome of Arrests, Convictions, and Incarcerations' (2016) 48 Clinical Psychology Review 32.
14. Fletcher and Wolfe (n 10) 119.
15. T Ginsberg, T Hirvikoski and B Lindefors, 'Attention Deficit Hyperactivity Disorder (ADHD) Among Longer-term Prison Inmates is a Prevalent, Persistent and Disabling Disorder' (2010) 10 BMC Psychiatry 112 doi: 10.1186/1471-244X-10-112
16. See S Young and others, 'A Meta-Analysis of the Prevalence of Attention Deficit Hyperactivity Disorder in Incarcerated Populations' (2015) 45(2) Psychological Medicine 247. Compared with published general population prevalence, there was a fivefold increase in prevalence of ADHD in youth prison populations (30.1%) and a tenfold increase in adult prison populations (26.2%).
17. See CM Berryessa, 'Attention, Reward, and Inhibition: Symptomatic Features of ADHD and Issues for Offenders in the Criminal Justice System' (2017) 9 Atten Defic Hyperact Disord 5 doi: 10.1007/s12402-016-0203-8
18. K Cunial and MR Kebbell, 'Police Perceptions of ADHD in Youth Interviewees' (2017) 23(5) Psychology, Crime and law 1.
19. S Young and others, 'Identification and Treatment of Offenders with Attention-deficit/Hyperactivity Disorder in the Prison Population: A Practical Approach Based Upon Expert Consensus' (2018) 18 BMC Psychiatry 218.

20. Youth Justice Centre, 'Attention Deficit Hyperactivity Disorder (ADHD)' (24 September 2018) <https://yjlc.uk/adhd/> accessed 4 December 2019
21. Youth Justice Centre (n 20).
22. D Nolte, 'Judiciary Need to Recognise Importance of ADHD on C' (*Lawyers Weekly*, 10 July 2018) <https://www.lawyersweekly.com.au/wig-chamber/23594-judiciary-need-to-recognise-importance-of-adhd-on-crime> accessed 4 December 2019
23. See, eg, M Smith, 'Hyperactive Around the World? The History of ADHD in Global Perspective' (2017) 30 Social History of Medicine 767 https://doi.org/10.1093/shm/hkw127
24. 'Magistrate Wins Support for Tough Stance on ADHD Defence' (*Queensland Times*, 8 August 2015) <https://www.qt.com.au/news/magistrate-wins-support/2732799/> accessed 4 December 2019
25. See KW Lange and others, 'The History of Attention Deficit Hyperactivity Disorder' (2010) 2(4) Atten Defic Hyperact Disorder 141; E Palmer and S Finger, 'An Early Description of ADHD: Dr Alexander Crichton and "Mental Restlessness"' (2001) 6 Child Psychol Psychiatry Rev 66.
26. A Crichton, *An Inquiry into the Nature and Origin of Mental Derangement: Comprehending a Concise System of the Physiology and Pathology of the Human Mind and a History of the Passions and their Effects* (T Cadell junior & W Davies 1798) 203.
27. Ibid.
28. H Hoffman, *Struwwelpeter: Merry Tales and Funny Pictures* (1844) <http://www.gutenberg.org/files/12116/12116-h/12116-h.htm>. See, too, J Thome and KA Jacobs, 'Attention Deficit Hyperactivity Disorder (ADHD) in a 19th Century Children's Book' (2004) 19(5) European Psychiatry 303; A Schwartz, *ADHD Nation: The Disorder, the Drugs, the Inside Story* (Little Brown 2016) 16–17.
29. GF Still, 'Some Abnormal Psychical Conditions in Children: The Goulstonian Lectures' (1902) 1 The Lancet 1008.
30. Still (n 28) 1165.
31. RA Barkley, 'The Relevance of the Still Lectures to Attention-deficit/Hyperactivity Disorder: A Commentary' (2006) 10 J Atten Disord 137.
32. Still (n 28) 1166.
33. A Rafalovich, 'The Conceptual History of Attention Deficit Hyperactivity Disorder: Idiocy, Imbecility, Encephalitis and the Child Deviant, 1877–1929' (2001) 22 Deviant Behav 93.
34. Barkley (n 30).
35. MW Laufer, E Denhoff and G Solomons, 'Hyperkinetic Impulse Disorder in Children's Behavior Problems' (1957) 19 Psychosomatic Medicine 38.
36. See KJ Neumärker, 'The Kramer-Pollnow Syndrome: A Contribution on the Life and Work of –>Franz Kramer and Hans Pollnow' (2005) 16(4) Hist Psychiatry 435 doi: 10.1177/0957154X05054708
37. JH Grohol, 'Famous People with ADHD' (*PsychCentral,* 19 June 2019) <https://psychcentral.com/lib/famous-people-with-adhd/> accessed 4 December 2019
38. C Bradley, 'The Behavior of Children Receiving Benzedrine' (1937) 94 American Journal of Psychiatry 577.
39. Bradley (n 37) 582.
40. See CK Conners, 'Attention-deficit/Hyperactivity Disorder: Historical Development and Overview' (2000) 3 J Atten Disord 17.
41. Named after Panizzon's wife, Marguerite, or Rita.
42. See A Schwartz, *ADHD Nation: Children, Doctors, Big Pharma, and the Making of an American Epidemic* (Scribner, 2016). See also JS Werry and others, 'Studies on the Hyperactive Child III: The Effects of Chlorpromazine Upon Behavior and Learning Ability' (1966) 5 Journal of the American Academy of Child Psychiatry 292; G Weiss and others, 'Effect of Long-term Treatment of Hyperactive Children with Methylphenidate' (1975) 112 Canadian Medical Association Journal 159–56; L Hechtman and others, 'Hyperactives as Young Adults: Preliminary Report' (1976) 115 Canadian Medical Association Journal 625.
43. CK Conners and L Eisenberg, 'The Effects of Methylphenidate on Symptomatology and Learning in Disturbed Children' (1963) 120 American Journal of Psychiatry 458; see also CC Keith, L Eisenberg and L Sharpe, 'Effects of Methylphenidate (Ritalin) on Paired-associate Learning and Porteus Maze Performance in Emotionally Disturbed Children' (1964) 28(1) Journal of Consulting Psychology 14.
44. See L-Y Chang, M-Y Wang and P-S Tsai, 'Diagnostic Accuracy of Rating Scales for

Attention-deficit/Hyperactivity Disorder: A Meta-Analysis' (2016) 137 Pediatrics 320152749.

45. He also developed the Conners Parent Rating Scale to obtain parental reports of child behavior problems: see CK Conners and others, 'The Revised Conners' Parent Rating Scale (CPRS-R): Factor Structure, Reliability, and Criterion Validity' (1998) 26(4) Journal of Abnormal Child Psychology 257.
46. Wender (n 6) 72, 176.
47. *R v Cumming* [2006] 2 NZLR 597; [2005] NZCA 260 at [26].
48. See *Eli Lilly Canada Inc v Apotex Inc*, 2010 FC 2065 (CanLII).
49. See KP Garock-Jones and GM Keating, 'Atomoxetine: A Review of its Use in Attention-deficit Hyperactivity Disorder in Children and Adolescents' (2009) 11 Paediatric Drugs 203 doi: 10.2165/00148581-200911030-00005
50. National Institute for Health and Care Excellence, *Attention Deficit Hyperactivity Disorder: Diagnosis and Management*. (NICE Guideline NG87 2018).
51. See M Olfson and others, 'National Trends in the Treatment of Attention Deficit Hyperactivity Disorder' (2003) 160 American Journal of Psychiatry 1071.
52. Office of Mental Health, Department of Health, Government of Western Australia, 'Attentional Deficits in Children: Diagnosis and Management of Attention Deficit Hyperactivity Disorder (ADHD) and Associated Disorders' (2002) <http://www.health.wa.gov.au/docreg/Education/Population/Health_Problems/Mental_Illness/Attentional_problems_in_children.pdf> accessed 4 October 2019
53. Therapeutic Goods Administration, 'Strattera' <https://www.ebs.tga.gov.au/ebs/picmi/picmirepository.nsf/pdf?OpenAgent&id=CP-2010-PI-04269-3&d=201910201016933> accessed 4 October 2019
54. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* (DSM-II), APA, 1968.
55. See VI Douglas, 'Stop, Look and Listen: The Problem of Sustained Attention and Impulse Control in Hyperactive and Normal Children' (1972) 4 Canadian Journal of Behavioural Science 258.
56. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III), APA, 1980.
57. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R), APA, 1984.
58. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV), APA, 1994.
59. American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), APA, 2013.
60. See MH Sibley and others, 'When Diagnosing ADHD in Young Adults Emphasize Informant Reports, DSM Items, and Impairment' (2012) 80 J Consult Clin Psychol doi: 1052 10.1037/a0029098; MT Willoughby, 'Developmental Course of ADHD Symptomatology During the Transition from Childhood to Adolescence: A Review with Recommendations' (2003) 22 J Child Psychol Psychiatry 88 doi: 10.1111/1469-7610.t01-1-00104
61. Fletcher and Wolfe (n 10) 119.
62. S Cortese and others, 'Toward Systems Neuroscience of ADHD: A Meta-Analysis of 55 fMRI Studies' (2012) 169 American Journal of Psychiatry doi: 103810.1176/appi.ajp.2012.11101521
63. See V Anderson, E Northam and J Wrennall, 'Neurodevelopmental Disorders' in V Anderson, E Northam and J Wrennall (eds), *Developmental Neuropsychology: A Clinical Approach* (2nd edn, Routledge 2018).
64. See LJ Kasper, RM Alderson and KL Hudec, 'Moderators of Working Memory Deficits in Children with Attention-deficit/Hyperactivity disorder (ADHD): A Meta-Analytic Review' (2012) 32 Clin Psychol Rev 605 doi: 10.1016/j.cpr.2012.07.001; DR Coghill, S Seth and K Matthews, 'A Comprehensive Assessment of Memory, Delay Aversion, Timing, Inhibition, Decision Making and Variability in Attention Deficit Hyperactivity Disorder: Advancing Beyond the Three-pathway Models' (2013) 44 Psychol Med 1989 doi: 10.1017/s0033291713002547
65. ED Musser and JS Raiker Jr, 'Attention-deficit/Hyperactivity Disorder: An Integrated Developmental Psychopathology and Research Domain Criteria (RDoC) Approach' (2019) 90 Comprehensive Psychiatry 65 https://doi.org/10.1016/j.comppsych.2018.12.016
66. See Fletcher and Wolfe (n 10) 119.
67. J Martin, 'Why Is ADHD More Common in Boys than Girls?' (*The Conversation,* 13

March 2018) <http://theconversation.com/why-is-adhd-more-common-in-boys-than-girls-92151> accessed 4 October 2019

68. See TA Klein, M Ullsperger and C Danielmeier, 'Error Awareness and the Insula: Links to Neurological and Psychiatric Diseases' (2013) 7 Front Hum Neurosci 14 doi: 10.3389/fnhum.2013.00014
69. See Anderson, Northam and Wrennall (n 59).
70. See AM Cooper, R Jeffries and E Stergiakouli, 'What Causes Attention Deficit Hyperactivity Disorder?' (2012) 97(3) Arch Dis Child 260 doi: 10.1136/archdischild-2011-300482; A Thapar and others, 'What Have We Learnt About the Causes of ADHD?' (2013) 54(1) Journal of Child Psychology and Psychiatry 3 doi: 10.1111/j.1469-7610.2012.02611.x
71. See, eg, Anderson, Northam and Wrennall (n 59).
72. See, eg, *R v Osborne* [2010] EWCA Crim 547 at [26]; *Fuller v The Queen* [2016] EWCA Crim 1867 at [15]; *R v AB*, 2017 ONCJ 419 at [68]; *R v KLC*, 2004 SKPC 98 (CanLII) at [14].
73. See, eg, *R v Osborne* [2010] EWCA Crim 547 at [26]; *Dixon v The Queen* [2013] EWCA Crim 465; *R v Newton* [2017] EWCA Crim 874 at [15]; *R v Conroy* [2017] EWCA 81 at [8].
74. *WW v The Queen* [2012] NSWCCA 165 at [36]; *Davis v The Queen* [2019] NZCA 40 at [42].
75. See *R v Lobato* [2017] EWCA Crim 2305 at [10]; *R v Balogh* [2015] EWCA Crim 44 at [4]. See generally I Freckelton, "Tourette's Disorder and the Criminal Law" (2019) 27 *Journal of Law and Medicine* 221.
76. *R v Lobato* [2017] EWCA Crim 2305 at [10] with features of anxiety; *R v Tallis* [2018] EWCA Crim 2481 at [15]; *R v Clarke* [2018] EWCA Crim 185 at [29]; *R v Balogh* [2015] EWCA Crim 44 at [4]; *Mount v The Queen* [2010] EWCA Crim 2974 at [42]; *R v KM*, 2007, CanLII 13937 (ONSC) at [8], [30].
77. See *Jackson v The Queen* [2013] EWCA Crim 163 at [9], arising from PTSD; *R v Balogh* [2015] EWCA Crim 44 at [4].
78. See *R v Van Ryn* [2016] NSWCCA 1 at [162].
79. See *R v Krey* [2019] NSWSC 762.
80. See, eg, *R v Rhodes* [2017] NSWSC 694.
81. See, eg, *R v Osborne* [2010] EWCA Crim 547 at [26]; *R v Balogh* [2015] EWCA Crim 44 at [4].
82. See *R v Haigh* [2010] EWCA Crim 570; *R v KLC*, 2004 SKPC 98 (CanLII) at [14]; *Singh v Police* [2016] NZHC 1739 at [36]; *R v Browne* [2017] NZHC 2389 at [54].
83. See, eg, *R v Williams* [2005] NSWCCA 355.
84. See, eg, *Judge v The Queen* [2018] NSWCCA 203; *R v Williams* [2005] NSWCCA 355.
85. *R v Hayes* [2015] EWCA Crim 1944 at [105]; *R v Grant-Murray* [2017] EWCA Crim 1228 at [47]; *R v Lewis* [2019] EWCA Crim 253; *R v AS* [2019] EWCA Crim 1458 at [11], [30]; *R v Conroy* [2017] EWCA 81 at [8]; R v Vittori [2019] NSWDC 583; *Norman v The Queen* [2012] NSWCCA 230; *R v Griffiths* [2018] NACA 1104 at [20].
86. *R v AB*, 2017 ONCJ 419 at [70]; *R v Heke-Gray* [2019] NZHC 2841 at [31]; *Pomare v The Queen* [2017] NZCA 155 at [18].
87. See J Pollak, 'Distinguishing Between ADHD and Mild Cognitive Impairment' (2012) 11(8) Current Psychiatry 48.
88. M Di Nicola and others, 'Adult Attention-deficit/Hyperactivity Disorder in Major Depressed and Bipolar Subjects: Role of Personality Traits and Clinical Implications' (2014) 264 European Archives of Psychiatry and Clinical Neuroscience 391 doi: 10.1007/s00406-013-0456-6
89. L Reale and others, 'Comorbidity Prevalence and Treatment Outcome in Children and Adolescents with ADHD' (2017) 26 Eur Child Adolesc Psychiatry 1443.
90. See evidence at trial described in *Zhang v The Queen* [2019] NZCA 507 at [55].
91. [2004] EWCA Crim 2661.
92. <https://ccrc.gov.uk> accessed 4 October 2019
93. *R v Friend* [1997] 1 WLR 1433; [1997] 2 All ER 101; [1997] 2 Cr App R 231; [1997] EWCA Crim 816.
94. See Ian Freckelton, *Expert Evidence: Law, Practice, Procedure and Advocacy* (6th edn, Thomson Reuters 2019), in relation to the traditional preclusion on expert evidence about ultimate issues.
95. [2004] EWCA Crim 2661 at [25].

96. [2004] EWCA Crim 2661 at [25].
97. [2004] EWCA Crim 2661 at [25].
98. [2004] EWCA Crim 2661 at [25].
99. [2004] EWCA 2661 at [30]–[31]. Compare *Dixon v The Queen* [2013] EWCA Crim 465.
100. [2010] EWCA Crim 547.
101. See, too, *Arlidge v Police* [2014] NZHC 2202 at [13] where Mander J observed 'given the length and nature of Mr Arlidge's drug dealing activities which showed him to be careful and forensically aware, the ADHD, while relevant, does not explain the premeditation and planning inherent in his illegal activities'.
102. *R v Osborne* [2010] EWCA Crim 547 at [36].
103. [2014] EWCA Crim 121.
104. *R v Ibrahim* [2014] EWCA Crim 121 at [13].
105. *R v Ibrahim* [2014] EWCA Crim 121 at [27].
106. (2000) 112 A Crim R 190; [2000] WASCA 127.
107. (2000) 112 A Crim R 190; [2000] WASCA 127 at [22].
108. (2000) 112 A Crim R 190; [2000] WASCA 127 at [50]–[52].
109. (2000) 112 A Crim R 190; [2000] WASCA 127 at [54].
110. (2000) 112 A Crim R 190; [2000] WASCA 127 at [55].
111. (2000) 112 A Crim R 190; [2000] WASCA 127 at [29], [33].
112. [2014] NZCA 124.
113. [2014] NZCA 124 at [6].
114. [2014] NZCA 124 at [11].
115. [2014] NZCA 124 at [24].
116. See Freckelton, *Expert Evidence: Law, Practice, Procedure and Advocacy* (n 93) 10.0.80; I Freckelton, 'Psychologists' Entitlement to Diagnose' (1998) 5 Psychiatry, Psychology and Law 159; see, too, *Allanson v Toncich* [2002] WASCA 216 at [12]; *R v Kucma* (2005) 11 VR 472. Compare *R v Whitbread* (1995) 78 A Crim R 452 and *Nepi v Northern Territory* [1997] NTSC 153.
117. (1990) 54 A Crim R 42 at [52].
118. See also *R v Petroulias (No 36)* [2008] NSWSC 626 at [164].
119. [2012] NSWCCA 165 at [58].
120. P Lichtenstein and others, 'Medication for Attention Deficit Hyperactivity Disorder and Criminality' (2006) 367(21) New England Journal of Medicine 2006 doi: 10.1056/NEJMoa1203241
121. See, eg, *R v Ferguson*, 2015 ABCA 310.
122. See Australian Law Reform Commission, *Equality, Capacity and Disability in Commonwealth Laws, ALRC DP 81* <https://www.alrc.gov.au/publication/equality-capacity-and-disability-in-commonwealth-laws-dp-81/7-access-to-justice/unfitness-to-stand-trial/>
123. See, eg, in the context of Asperger's disorder *Sultan v The Queen* [2008] EWCA Crim 6; *McGraddie v McGraddie* [2009] ScotCS CSOH 142.
124. See *R v Lochore* [2018] NZHC 2693 at [25].
125. *R v Lau* [2018] NZHC 2935 at [38]; see, too, *R v Palmer* [2016] NZHC 1962 at [65].
126. See the evidence by Dr Young in *R v Friend* [2004] EWCA Crim 2661 at [25]; *R v Lau* [2018] NZHC 2935 at [38].
127. DE Marcotte and S Markowitz, *A Cure for Crime? Psycho-pharmaceuticals and Crime Trends* (National Bureau of Economic Research, 2009).
128. See *Rodrigo v Police* [2014] NZCA 68 at [2] per Mallon J; see too *Sudol v Police* [2014] NZHC 1264.
129. See, eg, *Affleck v Police* [2017] NZHC 3220 at [20].
130. See, eg, the issue in *R v Ibrahim* [2014] EWCA Crim 121 at [13].
131. See *R v Osborne* [2004] EWCA 2661 at [30]–[31].
132. See the consumption of skunk in *R v Osborne* [2004] EWCA 2661 and of methylamphetamine in *Paparone v The Queen* (2000) 112 A Crim R 190; [2000] WASCA 127.
133. See *Paparone v The Queen* (2000) 112 A Crim R 190; [2000] WASCA 127.
134. See, eg, *R v Osborne* [2004] EWCA 2661.