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ATTENTION-DEFICIT DISORDER (A ROSTAIN, SECTION EDITOR)

Attention Deficit Hyperactivity Disorder (ADHD) in the Prison System

Susan Young[1] · Kelly M. Cocallis[2]

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Abstract

Purpose of Review To examine recent advances in the understanding of attention deficit hyperactivity disorder (ADHD) among the prison population.

Recent Findings Efforts have been made to develop useful tools for assessing ADHD among prisoners. Prisoners with ADHD demonstrate incremental vulnerability due to comorbid psychiatric disorders, neurodevelopmental disorders and traumatic brain injury. Compared with prisoners without ADHD, prisoners with ADHD become involved in the criminal justice system at a younger age and have higher rates of recidivism in adulthood. Recent studies demonstrate the effectiveness of extended release stimulant medication and psychological interventions. Early identification and treatment of prisoners with ADHD have the potential to demonstrate health economic benefits.

Summary Our understanding of ADHD among prisoners continues to develop. However, further research is needed, particularly among neglected groups such as females. Much more attention is needed by the prison service to engender better outcomes for this at-risk population.

Keywords Attention deficit hyperactivity disorder · ADHD · Prison · Offenders

Introduction

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterised by developmentally inappropriate levels of inattention, distraction, hyperactivity and/or impulsivity that are pervasive and interfere with functioning [1]. Within the prison system, ADHD is highly prevalent but under- and misdiagnosed [2••, 3]. It is posited that ADHD-related difficulties make those with ADHD more vulnerable throughout the criminal justice system [4–6]. Additionally, increased risk of comorbid psychopathologies among incarcerated individuals with ADHD, such as substance use disorder, presents unique challenges for treatment options [7]. Promoting our understanding of ADHD in prison systems continues to be of critical importance [8]. In this article, we provide a review of recent literature concerning identification, prevalence rates, comorbidity, course of ADHD and delinquency, treatment and cost to services, emphasising the challenges specific to the prison population. Strengths of the recent research and clinical implications, as well as directions for future research are highlighted.

This article is part of the Topical Collection on *Attention-Deficit Disorder*

✉ Susan Young
suzyyoung@aol.com

[1] Psychology Services Limited, London, UK

[2] Teesside University, Middlesbrough, UK

Identifying and Diagnosing ADHD

To date, most of the research on ADHD within the prison population has relied on the use of screening measures. Screening is often the first step of the diagnostic process, and whilst not a substitute for clinical diagnosis is generally considered valuable in the identification of ADHD. Challenging this notion however is evidence that suggests screening measures provide spurious findings. Some authors suggest they lack specificity which results in false positives. For example, the discriminative validity of the commonly used Wender Utah Rating Scale (WURS) has been criticised due to it misclassifying conduct disorder symptoms as ADHD [9, 10]. Consistent with this, a recent meta-analysis of 42 studies found a significantly higher prevalence estimate of 43% (95% CI 33.2–56.4) when screening measures were used, compared with 25.5% (95% CI 20.0–32.4) obtained

when a diagnostic clinic interview was used [11]. Further evidence comes from studies which have compared screens and comprehensive assessments within the same sample, limiting heterogeneity which can lead to spurious differences in outcome. Findings from a study that examined whether categorisation of screens were consistent with a comprehensive assessment revealed that only 35% (15 of 43) fulfilled the criteria for a diagnosis of ADHD when a comprehensive assessment was conducted, compared to 74% (32 of 43) indicating ADHD as measured with the WURS-25, and 100% (43 of 43) indicating 'highly likely to have ADHD' as measured with the Adult ADHD Self-Report Scale (ASRS) [12]. Other research has found that screens may lack sensitivity in the prison population [13•]. The need to develop more valid screening measures for routine evaluation of ADHD in the prison population has been highlighted as a critical area for research, with implications for timely and appropriate diagnosis and treatment interventions [13•].

Recent advances have occurred with the development of a brief version of the Barkley Adult ADHD Rating Scale (B-BAARS) for use specifically with the criminal justice system population [13•]. The B-BAARS is a short, six-item screen. It has been found to have good discriminative capabilities, demonstrating its potential use for identifying when further clinical assessment of ADHD may be warranted. It is available free of charge, reducing potential barriers to access. However, it is unclear whether the results are applicable to prisoners beyond that in which the measure was originally developed (sample was all males, primarily White British 99.0%). Screening measures have shown to vary in their predictive validity among different samples [14, 15•, 16–18]. It is possible that differences in respect to the manifestation and types of comorbidity, impairment and functioning, and cultural or gender-related response biases may result in variance of the B-BAARS sensitivity when used among ethnic minority and female prison populations. Further validation is required.

The implementation of valid ADHD screens in the prison system is likely to represent a challenge due to limited resources and level of expertise in the setting. ADHD continues to be both underdiagnosed and undertreated in the prison population. One study found that only 18.8% of individuals who were diagnosed in the study with ADHD had been previously identified by a health professional and that only 15.6% had received pharmacological treatment for their symptoms [13•]. Likewise, another study found that only two out of 30 prisoners with ADHD had been diagnosed in childhood [19]. Within the prison population, diagnosis is complicated by high levels of comorbid disorders that may mask the symptoms of ADHD. The symptoms of ADHD may also be misinterpreted as 'defiance' or 'bad behaviour', rather than attributed to a treatable condition. Furthermore, a diagnosis of ADHD requires evidence that prisoners' symptoms interfere with their functioning. It is understood that this may be difficult, particularly if they are not participating in activities that enable their functioning to be assessed. A further difficulty relates to continuance of medical records throughout any prison transfers that may occur [20]. This has clinical implications; further work should focus on raising awareness of ADHD and developing appropriate screening systems within the prison system in order to support the accurate identification of ADHD. Early detection may help to disrupt the antisocial trajectory that has been identified in the literature.

Prevalence Rates

Estimates of prevalence vary widely in the literature. The variability among studies is commonly explained by diagnostic criteria, sample characteristics and information source [21]. Nevertheless, studies have consistently reported a considerably higher rate of individuals with ADHD in prison comparative to the general population. When considering only diagnostic clinical interview data, a meta-analysis found a five- to tenfold increase in prevalence of ADHD in prison compared to age-matched general population rates [11]. This is supported by an updated meta-analysis which examined ADHD prevalence in a broader detained population (i.e. the study included psychiatric units) [22•]. Contrary to the prevalence and pattern of remission found in the general population (i.e. ADHD decreases across the life cycle), no significant differences have been found across age (adults versus youths) for prisoners. The lack of decline of ADHD with growing age may indicate that prisoners with ADHD remain in the criminal justice system because of repeat offending. The research data however was assessed in a cross-sectional context and thus prohibits a conclusive answer. Longitudinal data would be advantageous, however, may also demonstrate limitations (e.g. changes in diagnostic criteria across time and information source).

When considering differences in the gender ratio of ADHD, interpretation of findings is complicated because of the low proportion of studies directly investigating prevalence of ADHD in female prisoners and the small sample sizes involved which may limit representativeness. Research that has aggregated female and male prevalence studies has found that estimates do not significantly differ for gender [11, 22•], divergent from general population studies which have highlighted a large gender disparity (particularly for children). There are various possible explanations for this reduced ratio. If it is accepted that this represents a true narrowing in gender differences between the general population and prison population, this may suggest (i) protective mechanisms that ordinarily keep females out of prison are absent or eclipsed for female offenders with ADHD, (ii) female offenders with ADHD may experience more risk factors associated with incarceration, or both. Alternatively, apparent differences may reflect systematic referral or identification biases. A meta-analysis of 97 studies demonstrated that ADHD is more likely to

be diagnosed by health services in men than in women in the wider population [23], despite emerging evidence indicating traits are as common in women as men [24, 25]. Finally, the difference may be attributed to mean age of study population. In the broader literature, the gender ratio of ADHD narrows as individual's transition from childhood, to adolescence, to adulthood, demonstrating stability across gender [26].

Large geographical differences have been reported [11, 22•]. Some authors suggest that when prison population rates are very high as they are in Chile, the prison population may be more similar to the general population regarding their mental health than in countries with lower prison populations, thereby resulting in more moderate prevalence rates [27]. Alternatively, variability in prevalence rates may be indicative of specific judicial practices unique to the country which may affect the likelihood of individuals with ADHD reaching the prison system (e.g. diversion).

Comorbidities

It is well established that prisoners with ADHD have an increased risk of developing comorbid disorders, compared with prisoners without ADHD. A meta-analysis of 18 studies (sample of 1615 with ADHD and 3128 without ADHD) revealed that relative to adult non-ADHD prisoners, adult prisoners with ADHD had an increased risk of comorbidity with conduct disorder (OR 2.10, 95% CI 1.19–3.70), substance use disorder (OR 2.41, 95% CI 1.22–4.79), mood/affective disorders (OR 4.50, 95% CI 2.69–7.51), anxiety disorder (OR 3.58, 95% CI 2.32–5.53) and personality disorder (OR 3.22, 95% CI 2.07–5.01). Dissimilar, increased risk of comorbidity was limited to mood/affective disorders (OR 1.89, 95% CI 1.09–3.28) for youths [28•]. The obtained difference between youths and adults may suggest an incremental effect for the development of comorbidities; the onset of ADHD symptoms occurs and as ADHD remains undiagnosed and untreated, they become more vulnerable to the emergence of further difficulties [29].

Studies exploring clinical characteristics associated with the diagnosis of ADHD among prisoners have found a high prevalence of PTSD, signifying an increased risk of trauma experiences [30]. Prisoners with ADHD are also more likely to have experienced a traumatic brain injury (TBI) when compared to their non-ADHD peers. The possible association between ADHD and TBI is complex. Externalising behaviours may be an antecedent for risk-taking behaviour and/or aggression, thereby increasing the risk of TBI. ADHD and TBI share similar symptoms (e.g. frontal-executive problems), have similar risk factors such as low socioeconomic status, and coexisting disorders such as conduct disorder, all of which may play a role in associations. Importantly, the risk for adverse health and quality of life outcomes has been found to be greater among prisoners with ADHD comorbid with TBI than for those with ADHD-only, TBI-only, or neither [31•]. This demonstrates the extent of health impairment that may be attributable to ADHD and its potential additive effect when combined with other disorders. Alike, studies assessing the prevalence and overlap of neurodevelopmental disorders (NDD) have indicated comorbidity of NDD may result in additional psychiatric difficulties. For example, recent research has found that those with combined ADHD/autism spectrum disorder (ASD) had an additive vulnerability to experiencing psychiatric symptoms. This finding is consistent with earlier research which has demonstrated poorer mental health outcomes and distress for those with comorbid ADHD and ASD [32]. Findings also suggest ADHD poses a higher risk of suicide and that comorbidity with other psychiatric disorders may confer a cumulative risk [33]. However, some authors suggest the association between ADHD and suicidal behaviour may be fully mediated by other psychiatric disorders. The associations between ADHD and suicide risk remain understudied and poorly understood. Should ADHD constitute an independent or additional risk, this may be explained by the central components of ADHD, such as impulsivity and emotion dysregulation [34].

Despite the increasing exploration of comorbidity, a minority of studies explore the possibility of gender effects [35, 36•]. Studies of comorbidity comparing women and men with ADHD have demonstrated mixed findings and many studies are characterised by methodological limitations. Accordingly, interpretation of the specificity of gender differences remains uncertain. For example, it is not known whether the associations found between gender and comorbidity are unique to ADHD or simply replicate general population patterns of differential gender prevalence of disorders. Understanding the relation between gender and ADHD comorbidity is thought to be important in understanding the subjective experience (e.g. may influence sense of impairment related to ADHD symptoms).

An important question perhaps is whether identified comorbidities are characteristic of ADHD in general or whether prisoners with ADHD represent a unique subpopulation. The majority of research exploring comorbidities has focused on comparing prisoner populations with and without ADHD. Little research has been conducted comparing individuals with ADHD who have offended with individuals with ADHD who have not offended. A study which compared offenders and non-offenders with ADHD found that a significantly greater proportion of the offender group experienced clinical symptoms of mood disorders [37]. It is postulated that depression in individuals with ADHD may relate to social, occupational and academic impairments and failures associated with ADHD, and that criminal activities may have an additive effect. Substance dependence was also significantly more common for the offender group than for the non-offender group. It is possible that individuals with ADHD

and substance use may be more impulsive and opportunistic, and thus more likely to engage in criminal activities. Alternatively, ADHD offenders may be comparatively underdiagnosed and in the absence of a diagnosis, may be self-medicating [38, 39••]. This research indicates that prisoners with ADHD may represent a particular at-risk group.

Course of ADHD and Delinquency

Research has found an association between ADHD and delinquency. For example, youths with ADHD are more likely to commit offences than those without ADHD, when controlling for individual and community characteristics (e.g. gender, race/ethnicity, education of parents, family income, unemployment rate and crime rate) [40]. Individuals with ADHD are also younger at first arrest and conviction [35, 41•, 42–45]. Elucidating the relationship between ADHD and delinquency however is complicated by high comorbidities with other forensically relevant disorders such as conduct disorder, oppositional defiant disorder, antisocial personality disorder and substance use disorder which have been purported to explain the link [42, 43, 46, 47••, 48–51]. Positive associations have also been established between criminal behaviour and intellectual disability (ID) [52]. In a recent study, the coexistence of ID in prisoners with ADHD was shown to increase the likelihood of positive violent attitudes [53]. Nevertheless, research indicates that the presence of ADHD-only increases risk of offending behaviour [54]. Whilst it remains unclear as to whether ADHD has a causative role, a direct link between ADHD symptoms has been suggested and corresponds with Gottfredson and Hirschi's general theory of crime [55].

Some authors reason that predictors of delinquency and predictors of recidivism should not be considered equivalent [56]. In terms of recidivism, the literature is sparse and has reported mixed findings. A recent 15-year follow-up study of young prisoners revealed ADHD to be a risk factor for recidivism. Specifically, offenders with ADHD reoffended 2.5 times faster and showed a higher rate of recidivism and further incarcerations compared to offenders without a diagnosis of ADHD [47••]. This contradicts findings from an earlier study which did not identify ADHD as a predictor of recidivism in young adults, when controlling for relevant variables (e.g. conduct disorder, substance dependence) [57]. This study however was restricted in age range (15–24 years) and only used a 5-year follow-up period. Research suggests that the transition from adolescence to adulthood is a critical time in respect to the age crime curve, with some authors suggesting that youth criminality is the rule rather than the exception [58]. Thus, commensurate with developmental taxonomy theoretical assumptions of antisocial behaviour which considers ADHD to be a predictor of the life-course persistent pathway of criminal behaviour, it is possible that the predictive validity of ADHD for recidivism may be more prominent in the adult population. Further research with long follow-up periods subsequent to reaching adulthood is desirable in order to ascertain the course of delinquency. This is considered pertinent as risk factors are posited to change through the life course [47••].

Treatment Approaches

ADHD treatment guidelines recommend a multimodal approach, incorporating both pharmacological and non-pharmacological interventions [59].

Pharmacotherapy

Medication interventions for ADHD had not been evaluated among prison inmates until recently. The absence of pharmacological studies within prison settings has been attributed to concerns about safety and misuse of pharmacotherapies, in addition to the challenge of conducting pharmacological trials in prison settings [60•]. Pharmacological interventions are divided into stimulant and non-stimulant medications. Guidelines state that pharmacological treatment for ADHD should be considered as part of a comprehensive treatment programme for individuals across the age-span (> 5 years old) [59]. A posited secondary product of pharmacological interventions among prisoners is improved engagement in offender rehabilitation programmes [2••].

Stimulants

Stimulant medication is considered to be the most effective treatment for ADHD [61]. However, their use within the prison system remains controversial [62, 63]. The reasons for prohibiting their use have been documented; these include potential for misuse and diversion, which increases the risk of intimidation and victimisation, thereby exacerbating threats to security. Further issues include the burden on already overstretched medical staff in terms of administration, and increased risk of malingering/drug-seeking behaviour [7]. Although understandable, concerns are unsubstantiated. Research has indicated that stimulant treatment for ADHD does not increase the risk of substance abuse beyond that seen in those with ADHD who were not treated with stimulants [64]. Furthermore, some literature supports the notion that stimulants may actually decrease the risk of individuals with ADHD developing substance use problems (when treatment predates substance use), in addition to reducing illicit substance relapse when stimulant treatment is well supervised [65, 66]. It is hypothesised that stimulant medication may help to protect against illicit substance use by decreasing core ADHD symptoms such as impulsivity, reducing individuals' tendency to self-medicate, addressing underlying mechanisms

associated with addiction pathways, and by improving related factors such as social impairments. Moreover, the availability of extended release formulations and established successful protocols for the use of controlled substances (e.g. methadone maintenance treatment) minimises the risk of misuse and diversion [67]. Accordingly, some authors have questioned whether it is ethically defensible to deny recommended first-line treatment based solely on prisoner status [68].

Research into stimulant treatment for prisoners with ADHD has primarily focused on long-acting prescription stimulants. The efficacy of osmotic-release oral system methylphenidate (OROS-MPH) in the prison system was demonstrated in an initial 5-week randomised, double-blind, placebo-controlled, fixed dose trial comprising 30 Swedish high-security prisoners [60•]. The effect size based on the primary outcome measure of masked investigator-rated ADHD symptoms (Conners' Adult ADHD Rating Scale–Observer: Screening Version (CAARS-O:SV)) was large (Cohen's $d = 2.17$), indicative of a robust treatment effect. The authors acknowledged that this effect size was considerably larger than other adult population studies and attributed the distinct result to study characteristics including the severity of ADHD symptoms (i.e. high baseline scores permitting large scope for improvement), negligible placebo response, the reduced likelihood of incorrectly diagnosed participants, treatment adherence and preserved statistical power (i.e. all participants completed the RCT). Treatment effects continued during subsequent 47 weeks of open-label treatment, delivered as part of a multimodal treatment. Reduction of ADHD symptoms was accompanied by improved global functioning, behavioural control and quality of life [69••]. However as the open-label extension phase lacked a control group, no conclusions regarding comparative effectiveness were able to be made. The authors noted that for the study period, no misuse of ADHD medication or illicit substance use was detected as measured by urine toxicology, and have cited this as evidence supporting the potential use of stimulant medication in prison settings. However, the study used a dedicated ADHD wing for the duration of the study, resulting in a highly controlled setting designed to optimise the environment for prisoners with ADHD, which may have contributed to this finding and which may not be replicable in practice given limited resources and high burden.

Further evidence of the efficacy of OROS-MPH was demonstrated in a 24-week, randomised, double-blind, placebo-controlled trial of 54 Swedish medium-security prisoners with a co-diagnosis of ADHD and amphetamine dependence [70••]. Medication was initiated prior to release from prison and continued for 24 weeks whilst released on probation. The results showed that the OROS-MPH group demonstrated significantly greater improvement in ADHD symptoms (CAARS:SV), compared to the placebo group (95% CI −14.18 to −3.28, df = 50, $P = 0.002$). Additionally, intention to treat analysis revealed a significant difference in the proportion of negative drug urines in the OROS-MPH group compared to the placebo group (Md = 23% and 16%, respectively; $U = 250$, $Z = -1.985$, $P = 0.047$, $r = 0.27$). Whilst the findings provide some support for the feasibility and effectiveness of using stimulant medication in offenders with ADHD and substance dependence, caution is warranted due to the small sample size and the high overall attrition rate.

Both studies comprise small samples, limiting generalisability. A larger examination of the prison population is required to clarify effectiveness. This should include an investigation of the value of critical time interventions designed to facilitate the successful transition of offenders into the community (e.g. to register and engage with relevant health and community support services).

Non-stimulants

Non-stimulant medications are thought to offer an important alternative for those with comorbid ADHD and substance use disorder because they have limited abuse potential and cardiovascular risk [71, 72]. Whilst not as effective overall as extended release stimulants, some authors have suggested non-stimulants may be superior in regard to some aspects of quality of life due to the different side effects [73]. However, this has not been robustly researched in this population.

Non-pharmacotherapy

ADHD treatment guidelines state that non-pharmacological interventions should include programmes that address psychological, behavioural, educational and occupational needs. This is highly salient for prisoners with ADHD who are likely to exhibit lifelong patterns of poor behavioural control and antisocial behaviour. The only psychological treatment programme developed to specifically address the needs of those with ADHD and antisocial behaviour is the Reasoning and Rehabilitation 2 ADHD (R&R2ADHD). R&R2ADHD is a 15-session manualised CBT group programme suitable for adolescents and adults. Whilst there is robust meta-analytical evidence for the effectiveness of the original R&R programme for both youth and adult offenders more generally and across a variety of settings [74], evidence for R&R2ADHD is limited to community and inpatient male samples. Nonetheless, RCT studies in these populations show medium to large treatment effects in self-reported antisocial behaviour post-treatment and at 3-month follow-up [75•, 76].

Within the prison system, psychotherapies may present a logistical challenge (prisoners transferred between establishments, restrictions on movement, variations in sentencing and disruption caused by events such as attending court). Programmes therefore need to be able to be completed in a relatively short amount of time. R&R2ADHD can be

completed in approximately 2 months, making it a viable option for the prison system.

Cost to Services and Cost-Effectiveness of Treatment

There is abundant evidence that ADHD in the wider population leads to greater use of resources and confers significant financial burden in relation to education and health. In the UK, service costs linked with ADHD are reportedly £670 million annually [77], whilst in the USA, annual ADHD-related healthcare costs are estimated to be between $21 and $44 billion [78]. In relation to costs associated with criminal activities committed by children with ADHD, the cost to victims is estimated to be between $50 and $170 million per year, with the total cost to society between $2 and $4 billion dollars per year [40]. When focussing on the economic consequences of ADHD in prison, the costs are substantial. A recent UK study found that prisoners with (undiagnosed) ADHD utilised medical services significantly more than their non-ADHD counterparts. As a result, the medical costs for prisoners with ADHD were significantly higher, with total medical and behaviour-related prison costs estimated to be £590 more per year (per inmate) than for prisoners without ADHD. When the reported population of adult male prisoners in the UK and estimated prevalence rate of ADHD was factored for, this amounted to £11.7 million per annum [79•]. This should be considered a conservative estimate as in the study, behaviour-related prison costs were similar for prisoners with and without ADHD. This challenges previous research conducted in a larger Scottish prison which found that prisoners with ADHD symptomology accounted for eightfold more aggressive incidents than non-ADHD prisoners, and sixfold more incidents when controlling for ASPD [80]. Other studies have demonstrated a similar association between severity of ADHD symptomology and frequency and severity of misconduct in prison [81]. It is possible that critical incidents and/or data reporting vary between prison establishments. Where significantly higher behavioural incidents are demonstrated, it is likely that this will lead to a number of prison costs (e.g. increased adjudications, injury costs and potentially staff sickness), which in turn will result in a considerably higher estimate of £590 per annum per inmate.

Furthermore, the data were calculated from a male prison and there is evidence to suggest that whilst men and women with ADHD experience similar levels of objective impairment, that women report greater subjective impairment [26]. This could potentially result in higher costs, due to greater medical service utilisation comparative to men. For example, hospital stays, medication and psychological treatment are considered significant drivers of cost, which were not prominent in the study, but may be of relevance for broader samples of prisoners with ADHD. Further research is warranted in this area.

Treatment is likely to have important cost implications. It is posited that treatment for prisoners with ADHD would result in a return on investment in terms of social value and costs to wider society, including health care, criminal justice and social care. For example, a Swedish study of 25,656 individuals (drawn from Swedish national register) found that criminal convictions were significantly reduced by 32% (adjusted hazard ratio, 0.68; 95% CI 0.63–0.73) for men and 41% (hazard ratio, 0.59; 95% CI 0.50–0.70) for women during periods when they were receiving ADHD medication compared to periods without medication [82•]. Although not investigated in the study, it is likely that this reduction in recidivism would have resulted in considerable savings across the criminal justice system (including victim care) as well as costs associated with state-funded support and benefits associated with unemployment [83••]. Further work should assess the economic value of treating prisoners with ADHD by conducting a systematic evaluation such as cost benefit analysis (CBA) or social return on investment (SROI) [84].

Conclusions

Youths and adults with ADHD are disproportionately represented in the prison population. ADHD among prisoners, when untreated, is associated with considerable suffering for the individual and society. Comorbid conditions such as mood and substance use disorders result in cumulative vulnerability and may complicate diagnosis and treatment. Within the prison system, ADHD appears to be overlooked and often seen as secondary to other ostensibly more important conditions such as substance use disorder. Focus on comorbid conditions however is likely to result in treatment failure if ADHD is not treated as well. Importantly, effective treatment of ADHD has been shown to improve outcomes for comorbid disorders. Greater awareness of the presence and implications of ADHD are required by the prison service. It is acknowledged that this will not be easy in the context of competing demands and will require considerable cultural changes. Nonetheless, due to the disproportionate high rate of ADHD compared with the general population and the pervasive and long-lasting impact ADHD may manifest among prisoners, ADHD is a condition that the prison system cannot afford to ignore. Effective interventions exist and have the potential to significantly decrease disruption in the prison system, increase the impact of rehabilitation programmes, reduce recidivism and ultimately change the trajectory of offenders. In the context of data from recent health economic analyses and the prospective savings that may be realised, attending to the needs of this at-risk group would seem to offer ‘win-win’ solutions for all stakeholders in the longer term.

Compliance with Ethical Standards

Conflict of Interest Susan Young has received honoraria for consultancy, educational talks and/or research awards from Janssen, Lilly, HB Pharma and/or Shire. Kelly M. Cocallis declares no potential conflicts of interest.

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