Cognitive Disorder Amongst Individuals Serving Sentences in Prison: Prevalence, Impact on Issues in Custody and Best Models of Service Response: A Rapid Review

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EXECUTIVE SUMMARY

The Correctional Investigator of Canada commissioned the Forensic Division of the Centre for Addiction and Mental Health to perform a review of the literature on issues relevant to sentenced inmates who have cognitive deficits.

The review's purpose was to describe the characteristics of each specific CD, their prevalence in prison settings, assessment techniques relevant to each disorder, and the relevant strategies for assisting such persons during their incarceration.

We performed a rapid review of the literature focusing on reviews of the international literature and Canadian source material to answer these questions.

The major cognitive disorders (CD) that prison inmates suffer include Intellectual Developmental Disability (IDD), Fetal Alcohol Spectrum Disorder (FASD), Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), and Traumatic Brain Injury (TBI). Each one of these disorders is described including details on what is known of their prevalence in custodial settings, specific needs and hazards. Responses to these needs are described under the headings screening and assessment, evidence-based interventions, and reintegration needs.

Research in this area is limited by inconsistent assessment methodologies. This results in varying estimates of prevalence. Some level of serious cognitive deficit was found in 15% of persons incarcerated in the Pacific region in Canada (Stewart et al, 2016).

Persons with CD are at risk at various points in the criminal justice system because they may not understand the information given to them and may experience adjustment difficulties as they enter custody. These challenges may be large and beyond their adaptive ability to cope contributing to adverse behaviour in custody, risk of victimization, exploitation, self-harm, as well as reincarceration due to the person's limited ability to benefit from the rehabilitation and reintegration programs.

To address the common patterns of difficulty that these persons face, their specific needs must be recognized by correctional staff. Through both training and an increased level of awareness amongst staff, specific assessment and intervention programming can be provided. A program of screening followed by tailored assessment depending on the type of CD suspected can lead to better identification of the nature of the difficulties that the person has. This forms the basis for specific behavioural formulation, adapted correctional housing and interventions to meet the needs of the person.

Specific tools are recommended for each disorder. There are promising evidence-based practices in adapted programming for IDD and TBI that warrant further study and implementation. They can form the basis for intervention frameworks for the major CD groups. Comprehensive training covering the definition of these disorders, the way in which they present in custody, and the adaptations to custodial and rehabilitative processes necessary for each group is an essential component of responding to these issues. There are few examples of curricula or training programs available. This represents a gap that could be readily addressed.

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1. INTRODUCTION

The Correctional Investigator of Canada, an independent Ombudsman for individuals under the custody or supervision of the Correctional Service of Canada (CSC), commissioned the Forensic Division of Centre for Addiction and Mental Health (CAMH) to review the literature on persons serving a sentence who have cognitive disorders and to identify evidence-based responses and best practices. Cognitive disorder refers to a broad range of cognitive and developmental disturbances including fetal alcohol spectrum disorder, intellectual developmental disorder, traumatic brain injury and autism spectrum disorders. There is also growing concern around the prevalence of attention deficit hyperactivity disorder (ADHD) among this population.

The Correctional Investigator commissioned a review to describe:

- Each cognitive disorder and the characteristics of it that are relevant in prison settings,
- The generally accepted assessment techniques for each type of disorder,
- The prevalence in prison settings compared to the general population for each disorder;
- Available strategies to address specific cognitive disorders in prison settings (including treatment, therapy, medication, accommodations, strategies to assist in adapting to a person's mode or style of learning, best practices in correctional management).

To address these questions, we adopted a rapid review methodology (King et al, 2022) to undertake a structured review of the evidence, with priority given to systematic reviews and recent research and informed by the authors' clinical experience. We sought to summarize the literature and describe areas of consensus and where gaps exist in current knowledge.

This review includes an examination of correctional and programmatic responses such as health interventions tailored to these cognitive disorders. In addition, the review will also briefly address issues related to attention deficit hyperactivity disorder. The structure of this report is as follows: After describing the methodology of the work, we will address available evidence for each major diagnostic group: intellectual developmental disorder, fetal alcohol spectrum disorder, autism spectrum disorder and traumatic brain injury.

For each diagnostic heading we will describe evidence in the following domains:

- Prevalence of the condition among the incarcerated population.
- Impact on functioning within custody and impact on criminal justice outcomes, including adjustment to incarceration and capacity to benefit from rehabilitation programming.
- Service responses to these challenges will be grouped using the STAIR model (Forrester et al., 2018; Simpson et al., 2022), encompassing screening, triage and assessment, intervention and reintegration. In each area we will highlight the best evidence and identify knowledge gaps.

A further section on attention deficit hyperactivity disorder is included but not comprehensively reviewed.

2. METHODOLOGY

We employed a formal rapid review methodology (King et al., 2022) of global academic literature and grey literature. The rapid review has been developed as a method to synthesize available literature with particular relevance to policymakers. Rapid reviews have a distinct and clear methodology, but focus on the major findings from the literature, including from systematic reviews relevant to the policy question. The review focused on narrative, systematic reviews and meta-analyses published between January 2014 and the search date of July 22nd, 2024. The search was conducted using MEDLINE and Criminal Justice Abstracts to ensure a comprehensive search of both the medical and criminal justice literature. The literature search was conducted using database specific syntax and search terms in relation to cognitive disorders and the criminal justice-involved population.

The initial search revealed a total of 1116 articles with 848 articles remaining once 248 duplicates were removed. Following the title and abstract screening, 136 full texts were assessed for eligibility. Upon review of full-texts, 99 studies did not meet inclusion criteria and there were 37 articles remaining. The grey literature was retrieved from government and non-governmental organization websites identified using predefined search terms in Google and Google Scholar.

Studies were included that met all the following criteria:

1. Peer-reviewed review or meta-analysis, published in English, or any primary study from Canada between 2014 and July 2024.
2. The study investigated cognitive disorders including Intellectual and Developmental Disorder (IDD), Traumatic Brain Injury (TBI), Fetal Alcohol Spectrum Disorders (FASD) and Autism Spectrum Disorders (ASD).
3. The aim of the study was to investigate the (a) prevalence and needs (b) screening and assessment (c) interventions and implications in correctional settings for those affected by the cognitive disorders.

The search was inclusive of studies published in English in all geographic locations.

Data Synthesis: A narrative synthesis of the results, key findings and limitations of the published literature was conducted and presented in the results below. We include comments on gaps in literature, best practice recommendations and future directions for this field.

We will organize the corrections service response into headings derived from the STAIR model of health service delivery in correctional settings (Forrester et al., 2018; Simpson et al., 2022). This model defines the key service components that must be provided for each disorder (screening, triage, assessment, intervention, reintegration), with commonalities between disorders being a central component. It allows a framework for measuring service levels and access rates, which can be compared against epidemiologically derived benchmarks of need. We employ these headings to organize the literature in relation to each disorder as well as for the broader grouping of cognitive disorders.

3. RESULTS

We will initially describe some of the challenges relevant to all cognitive disorders followed by a description of each individual cognitive disorder and the particular issues that incarcerated persons with these disorders face. These diagnostic groups are IDD, FASD, ASD, TBI and ADHD. For each major group we will address definition, prevalence and correctional need, screening and assessment responses and evidence based intervention and custodial programs. As many of the issues overlap across these groups, and indeed there is considerable co-morbidly among these disorders, we include a final section that looks at a more integrated review of needs and evidence-based responses. Recommendations will follow in Section 4. As reported prevalence rates are variable across different studies and settings, and as there have been multiple reviews on this subject, we have summarized this information by diagnostic group in the tables in Appendix 1.

3.1 COGNITIVE DISORDERS IN GENERAL

A cognitive disorder is a mental condition that impacts an individual's cognitive functions, including learning, memory, perception, attention, problem-solving, language and executive functioning. These disorders can significantly impair a person's ability to think, reason, or remember, often affecting daily functioning and quality of life. People with cognitive disorders may experience memory loss, challenges with attention and concentration, and difficulties in language or perceptual abilities, such as understanding spatial relationships or verbal expression. Executive functioning, which involves skills such as planning, organizing, and decision-making, may also be compromised. Cognitive disorders include intellectual disability, fetal alcohol spectrum disorder, autism spectrum disorder and traumatic brain injury.

A Canadian study of men entering custody using the Cognistat (a general measure of cognitive dysfunction) found that 25% of 527 newly admitted Pacific region federal prisoners had some level of cognitive deficit with 15% having more severe deficits (Stewart et al., 2016).

Risks Specific to CD in the Criminal Justice System

While most people with these disorders never become criminal justice involved, some do (Herrington, 2009; Jones, 2007) due to certain behavioural manifestations of their conditions, overlapping risk and developmental pathways, and at times co-morbid antisociality. While diversion programs have been implemented across jurisdictions, they are often met with political resistance (Hellenbach et al., 2017) and many individuals with CD serve prison sentences where they face hazards including victimization throughout the criminal justice pathway.

Initial Detention Process and Communication Barriers.

Some individuals may not have been diagnosed with CD prior to contact with the CJS, nor are they diagnosed during legal proceedings, and consequently their needs may not be assessed until they enter custody (Søndenaa et al., 2008). Furthermore, individuals with CD are more prone to contact with the criminal justice system at a younger age (Mela et al., 2022). The lack of proper identification and assessment may delay necessary treatment, increasing risk of adversity (Helverschou et al., 2018; Popova et al, 2019). Neuropsychological deficits may be associated with their conditions, such as impaired judgment, impulsivity and the inability to anticipate outcomes, (Mela et al., 2022). During legal processes, persons may not understand what is happening to them as information provided to detainees about their

rights and entitlements is often lengthy, confusing, and filled with jargon (Huyn, 2014; Parsons & Sherwood, 2016) making it difficult for affected individuals to navigate legal processes (de Geus et al., 2021; Hunter et al., 2023),

Victimization and Self-Harm.

Offenders with an intellectual disability are at elevated risk of suicide in prison (Fazel et al., 2008). Deficits, including difficulties in reading emotions, nonverbal communication, social interactions, motor coordination, and a tendency to speak without regard for social consequences can lead to higher risk of victimization in prison, which may also contribute to their increased rates of self-harm. As noted, victimization and exploitation is a major risk for persons with CD in custody. Many of the factors noted to predispose to victimization are modifiable with thoughtful correctional approaches that apply to reducing victimization overall in custody and particularly for those with CD. Recommendations that flow from the work of Loberg (2009) and Fisher et al. (2012) include a positive sensitivity to reports of victimization with thorough investigation, encouraging an environment that intervenes early to prevent incidents and encourages reporting of lower level threats, separation of those with history of victimization from those with a history of perpetration including protective custody.

Social Interaction Challenges with Correctional Staff and Inmates.

CD can produce difficulties following or remembering rules and directions, impulsivity, challenging sexual and social behaviours, communication challenges, fatigue, and mood regulation difficulties. These may all lead to disadvantage in custodial settings as they may make individuals targets for violence or may be mistaken for intentional noncompliance by staff resulting in punitive measures (Helverschou et al., 2018; Esan et al., 2015; de Geus et al., 2021; Hunter et al., 2023). They may be more suggestible and struggle to understand others' perspectives, leading to misinterpretations of social cues, confusion by negative reactions to their behaviour and potentially aggressive reactions (Helverschou et al., 2018; Esan et al., 2015) Some persons with CD may have a literal interpretation of language and lack social understanding that can result in misunderstandings and increased vulnerability in correctional settings (Helverschou et al., 2018). This may partially account for higher recidivism rates in this population, perpetuating a cycle of incarceration (Mackay, 2015). In Canada, it contravenes Commissioner's directives to house inmates in a higher security setting based on their IDD status (Wheatly, 2018).

Behavioural Risks and Misunderstandings

Brown et al. (2015) describe how persons with cognitive deficits often struggle to follow prison-based routines, which can be misinterpreted by correctional staff as laziness or willful disobedience. The inability to delay gratification, lapses in emotional control, and a propensity for impulsivity further contribute to difficulties in complying with institutional regulations, leading to frequent infractions and negative interactions with both inmates and staff (Brown et al., 2015; Mela et al., 2022). Because of difficulties with social imagination, flexibility of thought, and a tendency towards repetitive behaviour, inmates with ASD might not learn from past experiences, increasing their risk of repeating problematic behaviours or being victimized. The lack of developmentally appropriate sex education may lead to inappropriate sexual behaviours, not necessarily due to a lack of empathy but due to difficulties in recognizing social cues and boundaries (McCarthy et al., 2019; Newman et al., 2015).

Rehabilitation Challenges

During incarceration, individuals with CD are competing for limited resources with other specialized needs groups. This can lead to their being housed under unnecessarily high security causing increased social isolation and less access to rehabilitative programs (Glaser & Deane, 1999; Søndenaa et al., 2008; Talbot, 2010; Adlard, 2011). Persons in custody often experience difficulties with rehabilitation and transition back to the community due to their unique needs and deficits (Parsons & Sherwood, 2016; Allely, 2016; Helverschou et al., 2018). Adhering to parole conditions and rules may impair reintegration into society, often resulting in a feedback loop of recidivism due to breach of parole conditions (de Geus et al., 2021; Hunter et al., 2023)

Comorbidities

Persons with CD often have co-morbid physical and mental health concerns (Hellenbach et al., 2017) and find it difficult to manage their illnesses. These needs and risks mean that prison health services, specialist IDD health services and general health services must ensure that the health and social needs of people with CD are screened for and appropriately managed with access to effective therapy and treatment (Robertson et al., 2011, Wheatley, 2018).

Overall, the risks for these individuals in correctional settings described above are deeply intertwined and often reinforce each other, leading to a cycle of vulnerability and recidivism.

3.2 INTELLECTUAL DEVELOPMENTAL DISORDER (IDD)

Intellectual developmental disorders (IDD) are characterized by significant limitations in both intellectual functioning and adaptive behaviour that originates during the developmental period, typically during early childhood (American Association on Intellectual and Developmental Disabilities, n.d.). IDD is defined variously by different bodies, but reduced generalized intellectual functioning, represented by an IQ well below average (traditionally an IQ below 70, a requirement that has been relaxed somewhat in the DSM- 5-TR and ICD-11) as well as diminished conceptual, social and practical functioning (WHO, 2019). IDD is a category of disorder that is not etiology-specific, i.e., it reflects phenotypic outcomes rather than underlying developmental processes, and therefore overlaps somewhat with some other categories discussed herein (e.g., one may meet criteria for ASD and IDD given that autism-related processes have limited intellectual functioning since childhood to a clinically significant degree, or may meet criteria for ASD without IDD, or may meet criteria for IDD due to another factor such as Down's Syndrome).

Prevalence and Needs

The European Court of Human Rights has recognized that people with IDD are "a particularly vulnerable group in society" who experience multiple vulnerabilities within the penal system (Gulati et al., 2020). In 2008, a review of the literature by Fazel et al. (2008) from 1966-2004, reported the prevalence of IDD in incarcerated persons to be 0.5-1.5% (range of 0% to 2.8%); all reviewed studies used the diagnostic criteria of the International Classification of Diseases (ICD) or American Association of Mental Retardation (AAMR). More recent reviews reported higher rates which authors attribute to better identification of IDD but also to the higher rates of criminalization of this population (Hellenbach et al., 2017; Garia-Largo et al., 2020).

Hellenbach et al. (2017) reviewed the evidence of the prevalence of IDD from 2004-2014 and identified four studies (from UK, Israel, Norway and Australia) of convicted persons, involving a total of 4653 people. The authors only included articles where validated testing was used and found that prevalence rates

varied widely and ranged from 4%-69.6% across studies. More recently, Garcia-Largo et al. (2020) reviewed the literature on prevalence rates among male prisoners up to 2018 and unlike Hellenbach et al. (2017), did not limit the search to common-law countries. This review included over 15,000 incarcerated persons and reported similarly heterogeneous prevalence rates ranging from 1% to 69.6%, with this huge range reflecting poor methodology in some studies. However, most studies reported a rate of 0.5%-1.5% in-line with Fazel et al. (2008); including Holland & Persson (2011) surveying 7000 incarcerated persons where the prevalence rate of those with IDD was 1.3% (Garcia-Largo et al., 2020)

The authors of these reviews indicate that a key limitation in comparing prevalence across jurisdictions is the difference in testing and screening methods used to identify IDD (Hellenbach et al., 2017; Garcia-Largo et al., 2020). To improve the comparability of prevalence rates across jurisdictions, review authors recommend using the International Classification of Disease (ICD-11) to define IDD in all future studies (Hellenbach et al., 2017). In summary, the prevalence based on official diagnostic criteria is likely between 0.5-1.5% of incarcerated persons (range 0% to 2.8%; Fazel et al., 2008) but higher rates are found using other screening instruments which are likely to pick up other forms of cognitive disorders.

Subpopulations. Indigenous persons are overrepresented in the prison populations. In 2018, Aboriginal and Torres Strait Islander persons made up 2% of the Australian population but 28% of the total Australian prison population (Australian Bureau of Statistics, 2018). Similarly, in Canada, despite only accounting for 4% of the general adult population, Indigenous adults accounted for 33% of admissions to federal custody in 2022-2023. More specifically, Indigenous women accounted for 49% of female admissions, while Indigenous men accounted for 32% of male admissions (Statistics Canada, 2022; Department of Justice, 2024). However, tools used to identify cognitive impairment in these groups may be biased by cultural considerations and historic factors such as uneven access to education. Previous prevalence studies did not disaggregate by indigeneity. It cannot be assumed that rates of cognitive disorder found in these large scale reviews are typical of all subpopulations. Similarly, only one of the studies conducted gender-specific analyses and found prisoners with intellectual disabilities were more likely to be female and younger than 30 years (Hassiotis et al., 2011).

Screening and Assessment

The wide variability in reported prevalence rates of IDD underscores the importance of using validated IDD screening and assessment tools appropriate to correctional settings (Hassiotis et al., 2011; Dias et al., 2013; Garcio-Largo et al., 2020). As with screening for any condition, screening should only be employed when it leads to meaningful assessment and therapeutic interventions or service adaptations. Accurate screening is the first step towards providing tailored care and interventions for incarcerated persons with IDD. Recent studies report the feasibility of screening for intellectual disabilities (Board et al., 2015). A potential initial screening could be one that assesses reading ability although this screening should be followed up with further testing to limit over-diagnosis as factors like social deprivation, ESL status, and history of reading disability also affect literacy rates.

A major concern is the reliance on staff who do not have clinical training to conduct screening at admission. In Canada, guidelines in Federal prisons stipulate that a psychologist assess all these screened as potentially having an IDD (Wheatley, 2018). While alternative approaches may be practical in a resource-constrained environment, it can lead to errors in administration, under-reporting and erroneous interpretation due to insufficient training. Additionally, inconsistencies in cut-off scores across different studies and tools further complicate the identification of intellectual impairments, especially for those with borderline intellectual functioning.

Evidence Based Interventions in Corrections

Traditional rehabilitation programs may be less effective for individuals with this disorder, necessitating specialized treatment approaches. These rehabilitation services aimed at increasing adaptive functioning among prisoners are necessary for developing life skills and reintegration into society (Catalano et al., 2020b). While prison environments are designed for mainstream populations, persons with IDD would benefit from accommodations such as linguistically simplified materials, sensory adjustments (e.g., quieter spaces), and communication adjustments (Sutherland, 2023). Modified behavioural programs are needed to enable persons detained with cognitive impairments to comprehend and benefit from therapeutic interventions including treatments that target substance abuse and mental health disorders (Sutherland, 2023).

Cognitive behavioural programs may reduce reoffending, aid in managing emotions and behaviours in individuals with intellectual disabilities (Catalano et al., 2020b). A Canadian study assessed the use of CBT and specialized correctional programs to target impulse control and increase planning and strategizing for incarcerated persons who show cognitive and executive functioning deficits. Incarcerated persons with cognitive disorders completed correctional programs at a similar rate as those without disorders demonstrating that proper accommodation in programs can effectively support these individuals. Importantly, when proper support is provided, there were no significant differences in recidivism rates between persons with cognitive disorders and those without (Stewart et al., 2016). Such adjustments to recidivism reducing programming are aligned with the specific responsivity aspect of the Risk-Need- Responsivity model (Andrews & Bonta, 2006), which states that such interventions need to be tailored such that individual needs, including cognitive ability, be taken into account in the administration of interventions for maximum impact. This approach is also consistent with guidelines in Canadian federal prisons (Wheatley, 2018), which stipulate that incarcerated persons with IDD receive adjusted programming, but do not specify any best practices in how this is to be done.

3.3 FETAL ALCOHOL SPECTRUM DISORDER (FASD)

Fetal Alcohol Spectrum Disorder (FASD) refers to a range of symptoms and disabilities that result from prenatal alcohol exposure. These problems can be varied in form and severity and include physical symptoms (such as distinctive facial features, growth deficiencies) and cognitive impairments (such as limited intellectual function, learning difficulties including impaired memory and attention).

Prevalence and Needs

Global Prevalence and General Population Estimates. FASD prevalence in the general population varies significantly between populations. The global estimate is about 7.7 per 1,000 live births (Lange et al., 2017). In Canada, estimates range from 4% to 5% of live births (Flannigan et al., 2018a; Flannigan et al., 2018b; May et al., 2018), while in the United States, it is 5% (May et al., 2018) though these are likely considerable over-estimates given the lack of robust diagnostic tool use.

Prevalence in Correctional Populations. Correctional populations show a markedly higher prevalence of FASD. In Australian correctional settings, particularly among Aboriginal youth, the prevalence reaches 36% making youth with FASD 19 times more likely to be incarcerated than those without (Popova et al., 2011). In Canada, the prevalence of FASD in correctional settings varies widely based on the method of assessment used, ranging from 1.8% (via an assertive case ascertainment approach) to 23% (via clinic-based methods), with a pooled prevalence of 14.7% adults in custody (Popova et al., 2019). In the United States, the prevalence of FASD among incarcerated persons is estimated between 10% and 24% (Fast et

al., 1999; MacPherson & Chudly, 2007), with individuals having FASD being 19 times more likely to be incarcerated (Popova et al., 2011). Comorbidities also prevent heightened risk of reoffending for this group. Among the most prevalent comorbid conditions are conduct disorder, receptive and expressive language disorders, and chronic serous otitis media, with prevalence rates ranging from 50% to 91% (Popova et al., 2016).

These findings highlight the substantial variation in FASD prevalence rates across different subpopulations, emphasizing the heightened risk in correctional and forensic settings. The variation in methods and subpopulations underscores the need for more consistent diagnostic criteria and further research.

FASD Screening and Assessment Tools

Screening Tools. Popova et al. (2019) identified the use of the Screening Tool developed by Burd et al. (1999) but this has not been widely used. The FASD checklist and the Asante Centre for Fetal Alcohol Syndrome Probation Officer Screening & Referral Form are more focused on identifying FASD within correctional settings (Popova et al., 2015; Popova et al., 2011) and more extensively used. The review by Brown et al. (2015) did not specify any unique screening tool for FASD in corrections but instead relied heavily on comprehensive psychological assessments.

Assessment Tools. The assessment tools used in the FASD literature also vary, often reflecting the population and setting being studied. The meta-analysis conducted by Popova et al. (2019) included a variety of tools aimed at differing diagnostic frameworks, such as the IOM Criteria (Stratton et al., 1996), Digit Diagnostic Code (Astley & Clarren, 1999), and CDC Diagnostic Guidelines (Bertrand et al., 2004). These tools offer structured approaches to diagnosis but are not universally applied, leading to inconsistencies across studies. In another study, assessments were more contextual and included inpatient assessments, surveys, and interviews (Popova et al., 2015). Mela and colleagues' (2022) review incorporated a comprehensive approach, including psychological assessments (e.g., using the WAIS-IV), physical examinations focusing on FASD sentinel facial features, and extensive reviews of medical, educational, and criminal records, supplemented by interviews with patients and their families.

Challenges and Recommendations. The variability in tools across studies highlights the challenges in screening and diagnosing FASD. The lack of standardized, widely accepted screening tools complicates accurately identifying FASD cases, particularly in justice and correctional settings where individuals may present with complex and overlapping issues. While tools like the FASD checklist and Asante Centre for Fetal Alcohol Syndrome Probation Officer Screening & Referral Form are steps toward more reliable screening within the correctional system, they are not universally adopted.

Ideal Treatment Models and Evidence-Based Interventions in Corrections

There are some promising strategies that have been developed and are worthy of consideration correctional system wide. Training for correctional staff is a pivotal intervention strategy. Service providers, including correctional officers, psychologists, and probation staff, must have the knowledge and skills to identify and support individuals with FASD (Brown et al., 2015). Training programs focused on FASD awareness, identification, and intervention techniques ensure that staff can provide appropriate care, ultimately improving the management of FASD-related behaviours and reducing the likelihood of recidivism. The D.E.A.R. (Direct Language, Engage Support System, Accommodate Needs, Remain Calm; Brown et al., 2015) intervention approach, developed specifically for correctional settings, exemplifies how structured communication strategies can enhance interactions with FASD-affected individuals. This method helps correctional officers use clear, direct language, engage support systems, and accommodate

the needs of individuals with FASD, promoting more positive outcomes.

3.4 AUTISM SPECTRUM DISORDER (ASD)

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that affects how individuals interact with others, communicate, learn, and behave. The term “spectrum” refers to the large variation in symptoms and levels of disability that people with ASD suffer. It encompassed persons previously referred to as “autistic” and having “Asperger’s Syndrome”. Its onset is in childhood but may not be diagnosed until adulthood.

Prevalence and Needs of ASD

Global Prevalence and General Population Estimates. For reasons that are unknown, the global prevalence of ASD has risen significantly, estimated at 1-1.5% (Pérez-Crespo et al., 2019), and a male-to-female ratio of 4.5 to 1 (Maenner, 2020).

Prevalence in Correctional Populations. Individuals with ASD are detained in correctional facilities at higher rates than the general population, with prevalence estimates ranging from 2% to 17% across various studies (Anckarsäter et al., 2008; Billstedt et al., 2017; Hofvander et al., 2019; Lindsay et al., 2014; Ståhlberg et al., 2010; Sullivan et al., 2017; Underwood et al., 2016). Those with higher-functioning ASD who are detained in adult custody may mask significant social and communication challenges. Accurately determining ASD prevalence in prisons is challenging due to variability in diagnostic criteria and study methodologies. Some studies suggest that ASD traits are notably higher in prisoners than in the general population, with estimates between 4% and 18%, indicating potential under-diagnosis in penal settings due to resource limitations (Peraire et al., 2023).

Prevalence in Comorbidity. Comorbidity is high among individuals with ASD, with common conditions including substance use disorders (39.8%), schizophrenia spectrum disorders (31.7%), and other neurodevelopmental disorders (24.1%; Van Buitenen et al., 2021). Compared to neurotypical detainees, those with ASD exhibit higher rates of comorbidity with psychotic illness but lower levels of physical violence and problematic sexual behaviour. Autistic traits, particularly in communication and imagination, are more prevalent among incarcerated persons in high-security units.

Risks and needs specific to ASD in correctional settings

Sensory Challenges in Custodial Environments The complex, unpredictable nature of the detention environment presents unique challenges for those with ASD, such as significant sensory issues and an overwhelming amount of communication (Parsons & Sherwood, 2016; Holloway et al., 2020). The overwhelming sensory stimuli in these environments can be distressing, leading to behaviours such as aggression or withdrawal. Developing specialized units tailored to the sensory needs of autistic individuals could help mitigate the high rates of victimization they face while incarcerated.

Structure vs. Challenges. The experiences of incarcerated persons with ASD vary, though most are negative. Some detainees with ASD appreciate the rigid structure and routines of prison, as well as the interactions with other incarcerated persons (Helverschou et al., 2018). However, other studies have reported that persons detained who have ASD often seek privacy, face victimization from fellow detainees, and are more prone to self-harm (Esan et al., 2015; McCarthy et al., 2019; Newman et al., 2015). Persons who have ASD and are incarcerated might not learn from past experiences, increasing their risk of repeating problematic behaviours or being victimized (McCarthy et al., 2019; Newman et al., 2015).

Screening and Assessment Tools

There is no routine, standardized screening or assessment tool available for use at any stage of the criminal justice process to determine the presence and extent of ASD.

Screening Tools. Several screening tools have been validated for adults with ASD in community samples, such as the Ritvo Autism and Asperger Diagnostic Scale (RAADS)-14, a 14-item questionnaire with a sensitivity of 97 percent and a specificity of 46 to 64 percent in community samples (Holloway et al., 2020). However, these tools have not been validated in correctional populations.

The Autism Quotient (AQ) is another well-validated instrument that measures self-reported experiences across five domains commonly associated with ASD: social skills, communication, imagination, attention to detail, and attention switching (Robertson & McGillivray, 2015; McCarthy et al., 2015). However, it is not a diagnostic measure and has limited evidence for sensitivity and specificity in correctional settings.

Assessment Tools. Standard assessment batteries should incorporate ASD screening to address this issue. While cognitive and personality assessments may offer some insight into a potential ASD diagnosis, they often fail to address the specific neurodivergent needs of individuals with ASD, particularly in the absence of comorbid intellectual disabilities.

In England and Wales, intermediaries and Appropriate Adults (AAs) help bridge communication barriers during police interviews and detention, offering tailored strategies for criminal justice system (CJS) professionals to gather accurate evidence from individuals with ASD (Parsons & Sherwood, 2016).

Specialized tools are needed to assess the risks associated with ASD, as current evaluations are inadequate for predicting violent behaviour in this population (Holloway et al., 2020). When evaluating sexual violence risks, functional analyses should determine the influence of ASD symptoms on offenses, helping to avoid assumptions that ASD is directly linked to sexual offending. This approach leads to more accurate risk assessments and personalized recidivism reduction strategies (Allison et al., 2012; Baron-Cohen et al., 2001; Wouters & Spek, 2011).

Additionally, targeted training for prison staff and other judicial agents is essential, along with developing tailored interventions to prevent offenses. Institutions should also promote inclusivity and ensure continuity of care post-release (Holloway et al., 2020).

Ideal Treatment Models and Evidence-Based Interventions in Corrections

Given the heterogeneity in the course and presentation of ASD, an individualized case formulation approach to informing dispositional determinations may promote best practices for decision-making within the CJS (Barkham et al., 2013). Whilst this approach appears appropriate, there are no reported outcomes of this practice. Placement in specific correctional housing may be important. Universal training on ASD for CJS professionals and the development of standards for supporting individuals with ASD during incarceration and re-entry are necessary.

Currently, there are no specific treatment standards for autism within correctional settings; instead, the focus should be on skills-based educational therapies to improve social skills and reduce reoffending. Pharmacologic treatments may help manage certain behavioural symptoms, but more research and tailored programs are needed to support autistic individuals in the CJS.

3.5 TRAUMATIC BRAIN INJURY (TBI)

Traumatic Brain Injury (TBI) refers to any damage to the brain caused by an external force, including concussion and (other) closed- and open-skull injuries. TBI has a very broad range of severity, chronicity, and impacts on functioning that may be focal or generalized. These may include impacts on any facet of cognition as described above.

Prevalence of TBI

Global Prevalence and General Population Estimates. The global prevalence of TBI reveals a significant burden across populations, with notable disparities in specific subpopulations. Among the general population, estimates suggest a TBI prevalence of around 12% (de Geus et al., 2021; McGinley & McMillan, 2019). However, this figure markedly increases in specific demographic groups, such as men aged 18-25, who are at higher risk due to risk-taking behaviours, and men over 70, who are more vulnerable to falls (de Geus et al., 2021).

Prevalence in Correctional Populations. Within correctional settings, prevalence estimates range widely from 5.5% to 92.5% (Hunter et al., 2023). This variation reflects a diversity of populations and identification methods used; these may include simple self-report, records reviews, and various definitions of TBI including any past history of TBI, or TBI with ongoing impairment. A recent meta-analysis by Hunter et al. (2023) included 64 studies and over 52,000 participants and found that 45.8% (95%CI 37.8 – 54.1) of individuals in the criminal justice system have experienced TBI, with 32% (95%CI 25.0 – 39.8) suffering from moderate to severe injuries. Other studies report similar findings, with de Geus et al. (2021) estimating that 50% of incarcerated individuals have acquired brain injuries, including TBI, compared to just 12% in the general population. The variation in prevalence rates can be attributed to differences in assessment methods and definitions, but the consistent finding is that incarcerated populations are disproportionately affected by TBI.

In general, studies employing screening tools requiring self-report produce higher estimates, whereas those employing records review produce much lower estimates; this may reflect a failure to routinely assess and document TBI.

Prevalence in Correctional Subpopulations. Subpopulation analyses further reveal the nuances in TBI prevalence. Gender differences are inconsistent across studies, with males having higher rates of TBI than females, although some studies find that female rates are still significant (Hunter et al., 2023; McGinley & McMillan, 2019). For example, Bickle et al. (2024) found that TBI prevalence was higher among female prisoners (71.5%) than males (64%), and in some studies, justice-involved females exhibit even higher rates (88.7%). The prevalence of TBI in incarcerated women is particularly high among those who have

experienced intimate partner violence (IPV), with Nguyen et al. (2022) finding that 65% of incarcerated women have suffered a brain injury, with 62% of these injuries occurring before incarceration, due to domestic violence. Justice-involved women have been reported to have a prevalence of TBI of 72% compared to men at 65% (McGinley & McMillan, 2019; Allely, 2016).

These findings underscore the critical need for targeted interventions and policies to address the high prevalence of TBI in correctional populations, with a particular focus on vulnerable subgroups such as women, youths, and individuals with histories of IPV.

Risks specific to TBI in correctional settings.

TBI can present significant challenges for individuals within the criminal justice system, impacting their cognitive, emotional, behavioural and social capacities, depending on the severity and location of the brain injury. Symptoms of TBI, include executive dysfunction, memory impairments, mood disturbances, and anxiety, and can persist long after the injury (Hunter et al., 2023). This is especially concerning for incarcerated women, who frequently experience a compounded impact of TBI due to co-occurring conditions such as substance abuse, mental health disorders, and histories of physical or sexual trauma (O'Rourke et al., 2016; Nguyen et al., 2022; McGinley & McMillan, 2019).

TBI Screening and Assessment

Screening and assessing TBI in carceral settings is of high importance given its relatively high prevalence, its implications for placement decisions and risk assessment, and the potential for these injuries to go unnoticed or misdiagnosed without routine structured assessments.

Screening Tools. Various screening tools have been employed in correctional facilities to identify TBI among incarcerated persons. Self-report tools, such as the Brain Injury Screening Index (BISI), are frequently used but are prone to recall bias and inaccuracies due to cognitive impairments, particularly in populations with memory deficits (de Geus et al., 2021; Bickle et al., 2024; McKinlay & Albicini, 2016). Low-cost self-reported screening tools often overestimate TBI rates (McKinlay & Albicini, 2016), highlighting the need for supplementary methods to verify these reports, such as accessing medical records or interviews conducted by trained staff (Bickle et al., 2024; Setnik & Bazarian, 2007; de Geus et al., 2021). Standardized and systematic screening protocols, especially for vulnerable populations like women who have experienced intimate partner violence, are recommended to better address the repetitive nature of TBI and its intersection with criminal justice involvement (Nguyen et al., 2022).

Assessment tools. Assessment tools for TBI in correctional facilities focus on evaluating the severity and impact of the injury. The Ohio State University TBI Identification Method (OSU-TBI-ID; Corrigan & Bogner, 2007) is one of the most widely recognized and validated assessment tools, demonstrating predictive validity and reliability for assessing TBI severity and occurrence within the prison population (Hunter et al., 2023; de Geus et al., 2021; Moynan & McMillan, 2018; Allely, 2016). However, the length of the OSU-TBI-ID influences outcomes, with the full version yielding higher prevalence rates compared to its shortened version, suggesting that more comprehensive assessments may uncover a greater incidence of TBI (O'Rourke et al., 2016). The Traumatic Brain Injury Questionnaire (TBIQ) is another validated assessment tool that has shown high prevalence rates of TBI among incarcerated persons, but inconsistencies in definitions and methodologies across studies make it challenging to compare results and fully understand the prevalence of TBI in these settings (Bickle et al., 2024; McGinley & McMillan, 2019).

Overall, tools like the OSU-TBI-ID and the TBIQ are recognized as reliable but should be supplemented with follow-up interviews and medical record checks to enhance accuracy (Hunter et al., 2023; de Geus

et al., 2021; Bickle et al., 2024). Developing individualized treatment plans based on these validated assessments is crucial for addressing the specific needs of incarcerated individuals with TBI, ensuring they receive appropriate rehabilitation and support within correctional settings (Horn & Lutz, 2016).

Ideal Treatment Models and Evidence-Based Interventions in Corrections

Treating individuals with TBI in correctional facilities requires a personalized approach, given the complex cognitive and behavioural challenges that these individuals face. Cognitive remediation therapy (CRT) is one of the primary interventions used to address cognitive impairments in incarcerated persons with TBI. This therapy has been shown to improve domains such as executive dysfunction, attention, memory, and processing speed, which are commonly affected by TBI (Marcer et al., 2016; Hunter et al., 2023; Lawton & Huang, 2019). Despite its potential benefits, the implementation of CRT within correctional settings has been limited. The long-term effectiveness of CRT, particularly in prison populations, remains underexplored, with most studies relying on small sample sizes and lacking control groups, thereby limiting the generalizability of the findings (de Geus et al., 2021). Additionally, the Equip: A Forensic Peer Group Approach has been utilized to address social interaction skills and socio-moral development, though it similarly suffers from small sample sizes and mixed long-term results (Manchester et al., 2007).

Another promising approach is the use of link worker or facilitator interventions (Ramos et al., 2020). These interventions involve providing personalized support, re-entry planning, neuro rehabilitation and CRT interventions based on Risk-Need-Responsivity model (Andrews & Bonta, 2006) for incarcerated individuals with TBI, aiming to ease their transition from incarceration to community life (Nguyen et al., 2022; de Geus et al., 2021). For example, a pilot study in the United Kingdom developed the Brain Injury Screening Index to identify TBI history among incarcerated women and subsequently provided them with specialized support through link workers (Nguyen et al., 2022). These interventions have shown positive outcomes in terms of reducing recidivism and improving compliance with treatment plans. However, like CRT, these studies often suffer from methodological limitations, such as small sample sizes and the absence of control groups, which make it difficult to draw definitive conclusions about their effectiveness in the UK studies (de Geus et al., 2021).

NeuroResource Facilitation (NRF) is another intervention that has been applied in correctional settings to address the specific needs of individuals with TBI. NRF focuses on identifying the needs and resources required for individuals with TBI and their families, with the goal of reducing recidivism and improving productivity, whether through work, volunteering, or training (de Geus et al., 2021). The intervention specifically targets neurocognitive impairments such as working memory, attention, initiation, organization, problem-solving, inhibition of behaviour, self-monitoring, planning/anticipation, and mental flexibility (de Geus et al., 2021). Personalized planning, strategy application post-release, and supportive counseling are key components of NRF. Reported outcomes include a significant reduction in re-incarceration rates, with only 17% of participants re-incarcerated within a two-year span, compared to the usual 50% rate observed in the U.S. prison population (de Geus et al., 2021). Cognitive behavioural therapy (CBT) with mindfulness-based stress reduction (MBSR) showed improvements in coping strategies of incarcerated TBI patients but these improvements were not sustained in a 12-week follow up demonstrating that therapeutic endeavours need to address dual diagnosis and broader mental health issues including substance use disorder, trauma, psychiatric disorders, anger and depression management along with TBI symptoms (Bickle et al., 2024; Horn & Lutz, 2016).

Despite the promise of these interventions, there is a significant gap in tailored programs for specific subpopulations within the prison system, particularly females. Research suggests that incarcerated females with TBI often experience more complex trauma than their male counterparts, which can influence their ability to engage with and benefit from standard treatment programs (McGinley &

McMillan, 2019). Moreover, interventions that consider gender-specific needs and the interplay between TBI and other mental health issues, such as substance use disorders and trauma, are critically needed but largely absent (Allely, 2016).

In conclusion, while there are several interventions available for treating TBI in correctional facilities, such as CRT, link worker programs, NRF, and the Equip approach, their implementation is often hampered by limited resources and a lack of tailored programs. The effectiveness of these interventions varies, with many showing potential but requiring further research to establish their long-term impact, given small and uncontrolled studies. To improve outcomes for prisoners with TBI, especially in reducing recidivism, there is a pressing need for more comprehensive, evidence-based approaches that address the specific cognitive, behavioural, and gender-related challenges faced by this vulnerable population.

3.6 ATTENTION DEFICIT/ HYPERACTIVITY DISORDER (ADHD)

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterized by inattention, over-activity and impulsivity that interferes with day-to-day functioning including academic, occupational and interpersonal functioning. The diagnosis can be difficult to make in adults due to a lack of developmental information and the co-morbidity with substance use disorders (Glancy et al, 2024). ADHD can interfere with an incarcerated person's ability to function in custody, including showing higher rates of behavioural infractions and difficulty in utilizing programming or vocational activities.

Byrne and Guetner (2022) recently performed a scoping review on ADHD in corrections and noted a marked diversity of prevalence estimates in custody, varying from 9.1 to 45% compared with an estimated 2.7% in the general population. A systematic review and meta-analysis reported the prevalence of ADHD in adults in custody to be 26.2% (Baggio et al., 2018) with no difference by gender. Usher et al (2013) performed a prevalence study of ADHD in the male CSC population and found approximately 16.5% scored in the highest range of the Adult ADHD Self-Report Scale (ASRS) which was suggestive of a diagnosis of ADHD. They reported that ADHD symptoms were associated with institutional misconduct and poorer outcomes on community release.

Treatment is controversial. Psychological approaches are recommended but not shown to be effective in correctional populations. The primary treatment has been the prescribing of psychostimulants though there are effective non-stimulant drugs also. There is no agreement in the world literature about recommended treatment or the order in which treatment should be undertaken (Byrne & Guetner, 2022). This stems from the evidence of comorbidity of ADHD and substance use disorders, and abuse of the psychostimulant agents prescribed for ADHD in custodial settings. Thus, whilst there are clinical trials in correctional settings showing the effectiveness of psychostimulants in decreasing symptoms of ADHD, these studies have been criticized as being of small sample size, of short term design, of high risk of bias; therefore at this point the evidence is too weak to be the basis for specific treatment recommendations (Boesen et al, 2022).

These practical realities of prescribing these agents in correctional settings makes the use of psychostimulants difficult. Recommendations from the United States of Appelbaum et al. (2015) have been adapted as guidelines for treating ADHD in custody in Canada by the Canadian Academy of Psychiatry and the Law (Glancy et al., 2024). These guidelines describe a cautious and measured approach and propose an advanced agreement with the incarcerated person regarding use and abuse of the medication before prescribing is undertaken.

4. INTEGRATING RESULTS AND RECOMMENDATIONS

The wide discrepancy in research findings about prevalence rates in the above conditions indicates the importance of consistent, validated assessment practices to identify incarcerated persons with CD. As noted above, many issues overlap for those with cognitive disorders, in terms of needs, causes, correctional challenges and management implications. This section addresses the implications of this information that can guide recommendations for the development of correctional systems to respond effectively to these needs.

Screening and Assessment

To alleviate the burden on limited clinical resources, Catalano et al. (2020b) suggest a phased approach to screening and assessment where threshold questions are asked upon prison reception to screen for likely cognitive impairment (adapted from Board et al., 2015). This would be followed by a clinician review to determine diagnostic questions and selection of the diagnostic assessment instruments (New & James 2013). Board et al. (2015) developed thirteen screening questions for cognitive disorders that can provide an initial indication of deficits in reading and learning from school through to adulthood, past diagnosis, problems in managing aspects of daily living (forms, managing money, being on disability support). These are useful gateway questions into more specific assessment.

Using standardized diagnostic criteria and standardized tools such as the Ohio State University TBI Identification Method (Moynan & McLillan, 2018; de Geus et al., 2021; McKinlay & Albicini, 2016), the FASD checklist and the Asante Centre for Fetal Alcohol Syndrome Probation Officer Screening & Referral Form (Popova et al., 2019) or the ICD-10 classification system of ID (Hellenbach et al., 2017) should be adopted where particular concerns are present. ASD specific tools such as the Ritvo Autism, Asperger Diagnostic Scale (RAADS)-14, and the Autism Quotient (AQ) are available and should be validated for correctional settings. (Holloway et al., 2020).

The feasibility and usefulness of screening and assessment tools will depend on institutional preparatory work, advanced instruction to staff who will administer the tool and the way the test is explained to incarcerated persons of different abilities and linguistic backgrounds (Catalano et al, 2020a). To maximize accuracy of screening environmental factors should have limited noise and distraction. Murphy (2018) recommends mitigating sensory issues for ASD. Adaptive functioning scales should be modified for the prison environment and activities that incarcerated persons can engage with in this setting. As with screening for any condition, screening should only be employed when it leads to meaningful assessment and therapeutic interventions or service adaptations.

Programming and Intervention

Population-specific programming, and the adaptation of existing programming, is crucial to accommodating those with cognitive disorders. This recommendation is in accordance with the well-established specific responsivity principle of incarcerated person intervention (Bonta & Andrews, 2007), which stipulates that interventions to reduce risk of re-offence must be tailored to individual needs and learning styles. It also accords with general clinical guidance on education and mental health intervention with those with intellectual disability, learning disability, and related cognitive concerns. This must be done in a way that is centrally coordinated, considers intersectional and comorbid concerns, and is guided by valid assessments.

Given the commonalities among many forms of cognitive impairment, and their prevalence as noted earlier, many recommendations are diagnostically cross-cutting and apply to all forms of cognitive disorder. Some of these are already addressed in CSC Commissioner's Directive 800-10, with regard to intellectual disability, such as population-level screening and referral to a psychologist for assessment to guide treatment decisions and risk levels. Given the high prevalence, and similar impacts, of other forms of cognitive disorder, this Commissioner's Directive should be expanded to include forms of cognitive disorder that do not meet criteria for intellectual disability.

Adapting existing programming, including educational/vocational, mental health treatment, and correctional treatments targeting risk of recidivism, is essential for all forms of cognitive disability identified herein. In some cases, this will involve making existing programming accessible to those with learning, sensory, and memory challenges, such as in the case of adapting educational, psychoeducational, and vocational material for those with specific learning disabilities. In non-correctional settings, this may constitute giving extra time on work assignments and evaluation activities, ensuring that testing is done in a distraction-free environment, and ensuring that modalities of education are adapted to client's special needs (e.g., making voice recordings of written materials or adapting to lower reading levels). Guidance for these adaptations should be personalized in the form of an individualized educational plan (Popova et al., 2011). Adapting some mental health interventions may include similar measures, such as simplifying materials and their communication, while also focusing more on behavioural than cognitive change strategies.

In some cases, developing or implementing purpose-built programming specifically for those with cognitive disabilities should be considered. This should, where possible, be done in conjunction with people with lived experience. In the case of programming for recidivism reduction, cognitive disabilities may be associated with distinct risk factors and targeting these is essential as it reduces recidivism (e.g., Brown et al., 2015). In the case of group programming, intellectual abilities should be considered since groups of mixed intellectual ability may be experienced as aversive or frustrating to those with very low ability, while efforts to tailor or slow down the material to these clients may result in boredom or frustration among other clients.

The sources reviewed above, in addition to best practices in non-correctional settings, highlight several specific recommendations related to programming for those with cognitive disabilities. These include the importance of coordination and continuity of care (both across programs within corrections and from corrections to the community) and avoiding piecemeal approaches that may be difficult for clients to navigate. To this end, it is recommended that one centralized staff member be assigned each case once screened with a potential disability. This person can act as a one-stop resource and can ensure the individual's needs are being met across programs, such as a case worker.

The provision of programming should be informed by a comprehensive, specialist assessment. Specific risk factors such as impulsivity, poor social cognition, moral reasoning, and emotion dysregulation require specific targeting in recidivism reduction programming. TBIs are especially variable in their implications for risk reduction and other programming, and specific patterns of impairment must be taken into account on an individual case basis.

The identification of previously unidentified cognitive disabilities, especially less visible ones such as specific learning disabilities and ADHD, may in itself be a validating experience and help explain to clients certain struggles they have faced (e.g., lost educational opportunities, frustration and downward social

comparisons). This should be considered and capitalized upon in re-offense reduction programming and serve as extra impetus for population-wide screening for such disorders.

Intersectionality and comorbidity must be considered when planning interventions. Programming priorities and efficacy vary according to sex and gender, the presence of mental disorder and substance issues, and severity of impairment. With regard to sex and gender specifically, very little is known about the efficacy of correctional interventions on women with intellectual and other cognitive disabilities, and some have been shown to be less effective among women than men (e.g. Lindsay et al., 2004). Programming for those with cognitive disabilities should be planned and evaluated separately for male and female participants, and correctional services should engage in program development and evaluation specifically for women. Assessment, diagnosis and intervention for mental disorder is more complex for those with cognitive disorders, and mental disorder is very prevalent among incarcerated persons with an intellectual disability, with approximately one third showing this comorbidity (Haut and Brewster, 2010). Misdiagnosing mental disorder in this population can lead to inappropriate risk level and placement decisions, missed treatment and risk reduction opportunities, or undue stigmatization. Finally, consideration of concurrent substance use and its treatment in conjunction with mental health concerns has been shown to be superior in incarcerated person populations to targeting either independently (Moyes et al., 2016; Peters et al., 2017), and an integrated dual diagnosis approach is therefore recommended.

In summary, an integrated, centralized and personalized approach to assessment, diagnosis, and programming that simultaneously attends to comorbidity, cognitive function, and gender is recommended for those with any of the conditions discussed herein. In some cases this may consist simply of accommodating those with learning disabilities within existing programming, and in others it may require the development and evaluation of targeted programming, e.g. for women with intellectual disabilities or those with complex needs involving mental disorder, substance use and comorbid cognitive impairment. An initial assessment by a psychologist with specific expertise in cognitive disorder, development of a plan involving a centralized case worker who can coordinate and guide the client through the system from admission to reintegration to avoid siloed and unintegrated approaches, and tailoring of the plan according to an assessment-guided formulation are all recommended. In areas where empirically supported programming is not available for a given type of client, it should be developed and evaluated.

4.4 Legal and Guardian Involvement

Involving families and legal guardians in the care of individuals with cognitive disorders, especially within correctional settings, is recognized as essential for ensuring comprehensive care and legal protection (Doody et al., 2017; McCreedy et al., 2018; O'Brien, 2022). The involvement of family members in health planning plays a pivotal role, as families often possess an intimate understanding of the person's needs, aiding professionals in providing personalized care (McCreedy et al., 2018). However, there are challenges, including confidentiality barriers that can hinder communication between families and healthcare professionals in general, and in correctional situations in particular (Doody et al., 2017). This divide, compounded by insufficient prioritization of family involvement, can result in disengagement and poorer outcomes.

Research highlights the benefits of family involvement, such as improved discharge planning, enhanced follow-up care, and better service delivery for forensic patients (McCreedy et al., 2018). Legal representatives, particularly for individuals in correctional settings with cognitive impairments, are crucial

in safeguarding the rights of these individuals and ensuring they receive appropriate care (O'Brien, 2022; Dvoskin, 2000). Systematic screening, training for legal professionals, and adopting a human rights framework are necessary to provide these individuals with fair and respectful treatment (MacKay, 2015).

By addressing these issues, correctional services can better accommodate the needs of individuals with cognitive disorders, fostering an environment of collaboration between families, legal guardians, and healthcare providers, ultimately improving outcomes for this vulnerable population.

These objectives require a policy framework that encourages the ongoing information for and involvement of family members and legal guardians during incarceration. This may well be time consuming and dedicated social work time is needed to facilitate this continuity of involvement. These issues are important throughout incarceration but become of central importance in planning reintegration upon release.

Training

Many of the reviews cited in this paper contain recommendations for training for corrections officers and other correctional staff in the care of people with cognitive disorders in custody. Despite these recommendations being widespread, we could find no evidence in the literature of published standards of training for correctional staff in helping these incarcerated persons.

Repeatedly, articles cited above describe the need for training. Topics to be covered include information about the core diagnostic groups, communicated in a way that correctional staff can understand to aid both recognition of these disorders and the way in which incarcerated persons suffering from these disorders may present to staff. Further, papers repeatedly referenced the need for staff to be aware of the particular vulnerabilities to exploitation and victimization that people with cognitive disorders may suffer, as well as the manner in which correctional care systems need to be adapted for their specific needs. Such adaptations include rehabilitative work and housing specific to their needs. Finally, specialist staff need to be trained in how to develop specific formulations of the behaviours that the person may present with to form the basis of specific care plans for persons with cognitive impairment. This process will involve specific adjustments to living in custody and the tailoring of rehabilitative programs and reintegration activities specifically to their needs.

There are in the grey literature a small number of reports of approaches that specific jurisdictions have taken to training correctional staff but no evidence of systematic evaluation or of standard setting of training needs or outcomes. This is a gap in the literature and in the practice of training staff is a gap that Canada could fill, and we recommend that a comprehensive training needs and curriculum be developed and implemented.

Training must be addressed as a matter of priority alongside any other innovations or interventions that flow from this work and are described above.

Re-entry planning

Upon release from prison, persons with CD require continuity in care once daily routines and expectations of prison life no longer exist and the individual faces the responsibility of making reliable decisions and choices. In transition to the community, they are vulnerable to falling back into old habits and routines and have difficulties with negative peer influences, drugs and alcohol (Hyun et al., 2014). General probation services rarely work for those with CD (Brown et al., 2015) and there is need for training of probation officers, social workers, and case managers to best support incarcerated persons with re-

entry (Ashworth & Tully, 2017).

Correctional release planners with an understanding of the challenges of CD will be in a better position to provide guidance and make referrals to community support providers. For example, when working with FASD-affected incarcerated persons, it is imperative to connect them with appropriate services, as reentry can be overwhelming without proper services and support (Boland et al., 1998). Community services for those with intellectual disability may include day centres, therapeutic and residential services, support services and carer services. To maximize effectiveness, strong links are needed with other services such as those listed below. Possible Services: Adult Rehabilitative Mental Health Services (ARMHS) Case Management Services Community Support Groups Children Therapeutic Support Services (CTSS) Drug and Alcohol Treatment Educational and Vocational Support Services Independent Living Skills (ILS) Individual and Group Psychotherapy Personal Care Attendants (PCA) Psychiatrist Services Supportive Housing Services Disability Services. It is imperative to develop a coordinated and personalized care plan that includes input from all health professionals and social care (Bhaumik et al., 2016).

The link worker is an effective intervention where staff such as psychology grads trained on TBI can set up a support system after the person's release involving a tailored reentry plan and follow-up for up to a year had promising results. Among service users CD, 65% engaged in meaningful activity post release and 50% gained employment with this system (Nagele, 2018). This promising practice needs replication.

There is a need for more research to develop evidence-based programming (Sutton et al., 2013; Martinello, 2015; Sala et al., 2019; Sevlever et al., 2013; Baarsma et al., 2016; Beddows & Brooks, 2016). Research should involve longer follow-up periods of up to two years as most recidivism occurs during this time (Yukhnenko et al., 2020). Although reducing recidivism is an important outcome, healthy lives, housing, and financial stability are all important factors that enable people to live fulfilling lives.

Appendix. Prevalence of Various Cognitive Disorders in the Reviews Relied on in this Paper.

Table 1. Intellectual and Developmental Disorder

Study	Year(s) Reviewed	Sample Size	Prevalence Rate (%)	Population Details
Fazel et al.	1966-2004	Various	0.5 - 1.5 (max 2.8)	General incarcerated population
Hellenbach et al.	2004-2014	4,653	4 - 69.6	Convicted persons (UK, Israel, Norway, Australia)
Hassiotis et al.	2011	3,142	4	Younger females and minority ethnic groups
Dias et al.	2013	1,279	9	Queensland prisoners
Søndenaa et al.	2008	Various	Mild IDD: 10.8; Borderline IDD: 25-30	General incarcerated population (screening method)
Garcia-Largo et al.	Up to 2018	>15,000	1 - 69.6	Male prisoners (varied jurisdictions)
Indigenous Persons (Australia)	2018	-	28 (of total prisoners)	2% of Australian population vs. 28% of prison population
Indigenous Persons (Canada)	2016	-	28 (of total prisoners)	4% of Canadian population vs. 28% of prison population
Hassiotis et al.	2011	3,142	-	More likely to be female and under 30

Table 2. Fetal Alcohol Spectrum Disorder

Study/Source	Prevalence Estimate	Population Details	Notes
Lange et al. (2017)	0.8% live births	Global	General estimate
Flannigan et al. (2018a, 2018b); May et al. (2018)	4% - 5% of live births	Canada	Regional estimates
May et al. (2018)	~5% of live births	United States	Likely over-estimated due to diagnostic limitations
Popova et al. (2011)	363.6 per 1,000	Australia (Correctional)	High prevalence among Aboriginal youth; 19 times more likely to be incarcerated
Popova et al. (2019)	17.5 - 233.5 per 1,000	Canada (Correctional)	Pooled prevalence of 146.7 per 1,000 among adults in custody
Fast et al. (1999); MacPherson & Chudley (2007)	10% - 24%	United States (Inmates)	Individuals with FASD are 19 times more likely to be incarcerated
Popova et al. (2019)	9.9%	Canada (Adults in Custody)	Specific estimate for adults in custody
Mela et al. (2022)	46%	Canada (Forensic Patients)	Highest prevalence in any forensic population examined

Table 3. Autism Spectrum Disorder

Study/Source	Prevalence Estimate	Population Details	Notes
Pérez-Crespo et al. (2019)	1% - 1.5%	Global	Significant rise in global prevalence
Maenner (2020)	Male-to-female ratio of 4.5:1	Global	Gender ratio for ASD
Anckarsäter et al. (2008); Billstedt et al. (2017); Hofvander et al. (2019); Lindsay et al. (2014); Ståhlberg et al. (2010); Sullivan et al. (2017); Underwood et al. (2016)	2% - 17%	Correctional Populations	Higher rates of ASD in correctional facilities
Peraire et al. (2023)	4% - 18%	Correctional Populations	Suggests higher prevalence of ASD traits than in general population; potential under-diagnosis
Van Buitenen et al. (2021)	39.8% (substance use disorders), 31.7% (schizophrenia), 24.1% (other neurodevelopmental disorders)	Individuals with ASD	High comorbidity rates among individuals with ASD

Table 4. Traumatic Brain Injury

Study/Source	Sample Size (if applicable)	Prevalence Estimate	Population Details	Notes
de Geus et al. (2021); McGinley & McMillan (2019)	-	~12%	Global	General population prevalence
de Geus et al. (2021)	-	Higher among men aged 18-25 and men over 70	Specific Demographics	Increased risk due to risk-taking behaviours and falls
Hunter et al. (2023)	64 studies, >52,000 participants	5.5% - 92.5% (45.8% mean)	Correctional Populations	Wide range reflects varying identification methods
Hunter et al. (2023)	-	32% (moderate to severe injuries)	Correctional Populations	Consistent finding of disproportionately high TBI prevalence in incarcerated populations
de Geus et al. (2021)	-	50%	Incarcerated Individuals	Acquired brain injuries including TBI
Bickle et al. (2024)	-	71.5% (higher than male prisoners at 64%)	Female Prisoners	Gender differences in TBI prevalence
Nguyen et al. (2022)	-	65%	Incarcerated Women	High prevalence among those with histories of IPV
McGinley & McMillan (2019); Allely (2016)	-	72%	Justice-Involved Women	Comparison to men at 65%

Table 5. Attention-Deficit/Hyperactivity Disorder

Study/Source	Prevalence Estimate	Population Details	Notes
Glancy et al. (2024)	~2.7%	General Population	Estimated prevalence of ADHD in the general population
Byrne & Guetner (2022)	9.1% - 45%	Correctional Settings	Diversity of prevalence estimates in custody
Baggio et al. (2018)	26.2%	Adults in Custody	Systematic review and meta-analysis; no gender difference
Usher et al. (2013)	~16.5%	Male CSC Population	Associated with institutional misconduct and poorer community outcomes

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