A Process Evaluation of the Regional Psychiatric Centre's Fetal Alcohol Spectrum Disorder Pilot Project:

Year 1 (July 2018 - June 2019)

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March 2021

Deliverable:

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Submitted by the:
Centre for Forensic Behavioural Science and Justice Studies

Submitted to:
Correctional Service Canada

March 24, 2021

UNIVERSITY OF SASKATCHEWAN
Centre for Forensic Behavioural Science and Justice Studies
USASK.CA/CFBSJS

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Recommended Reference:

Kerodal, A.G., Akca, D., Jewell, L. M., & Wormith, J.S. (2021). *A Process Evaluation of Regional Psychiatric Centre's Fetal Alcohol Spectrum Disorder Pilot Project: Year 1 (July 2018 - June 2019).* Centre for Forensic Behavioural Science and Justice Studies - University of Saskatchewan, Saskatoon, SK.

Acknowledgements

The evaluation team is grateful to those who generously shared their time and knowledge during the preparation of this report. The project team wishes to thank:

- Lynn Stewart, Ph.D., C.Psych. (CSC – Senior Research Manager, Interventions and Women Offenders Research) for her support and guidance in designing and obtaining CSC approval for the study;
- Deqiang Gu, Ph.D. (CSC – Epidemiologist) and Laura S. Garratt (CSC – Mental Health Epidemiology) for their advice and assistance in obtaining CSC approval for the study;
- Members of the FASD Team who consented to participate in the evaluation and provided clarifications;
- Alexandra Zidenberg (Applied Social Psychology Doctoral Program, University of Saskatchewan) for her assistance in the ethics application;
- The FASD Coordinator for helping the lead author obtain CSC security clearance to assess CSC data, answering numerous questions about the FASD Program, facilitating the evaluation and providing feedback on a draft copy of the Program Model chapter.

Glossary of Terms

Asante Youth Screen (AYS): An FASD screen which consists of 10 items on Social Factors (5) and Personal Factors (5), designed to be completed by youth parole officers.
Brief Screen Checklist-Revised (BSC-R): a 36-item FASD scale, broken down into Behavioural Indicators (26), Historical Indicators (4) and Maternal Indicators (6).
Brief Screen Index (BSI): An FASD screen with items on Maternal Health (3), Childhood (social, mental health and criminal justice) System Contacts (3), Criminal History (3), Dependent Living in Adulthood (3), Childhood Foster Placements (3), Health History (3), Substance Use (3), and Impulsivity (3).
Complex Needs (CN): A possible diagnosis provided by the FASD Team; requires a score that is 2 or more standard deviations below the mean on at least three of the ten neurodevelopmental domains used to diagnose FASD. There must be no evidence of Prenatal Alcohol Exposure (PAE) or Sentinel Facial Features (SFF).
CNS Impairment: Scoring 2 or more standard deviations (SD) below the mean on at least three of the ten neurodevelopmental domains (i.e., neuroanatomy/neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation) used to diagnose FASD.
Correct Prediction Rate: Usually computed using receiver operating characteristics (ROC) analyses, whereby an Area under the Curve (AUC) ranges from 0-1; due to the small sample size, this was computed using the formula: (true positives + true negatives) / total cases * 100.
FASD Program: A pilot program implemented in the Regional Psychiatric Centre (RPC) to diagnose patients for FASD, and treatment recommendations to address the cognitive needs of assessed patients.
Operations Division: One of the three divisions in CSC institutions; includes correctional officers, including supervisory officers.
Interventions Division: One of the three divisions in CSC institutions; includes parole officers and program officers that deliver core programming; the Chaplain; Elders and Aboriginal Liaison Officers who deliver cultural supports; and supervisors of employed patients.
Clinical Division: One of the three divisions in CSC institutions; includes health care and mental health staff (e.g., social workers, psychologists, psychiatrists, general practitioners, nurses, and occupational therapists)
FASD Team: Staff and Stakeholders involved in the FASD Program. Included staff from Operations, Interventions and Clinical Divisions, the FASD Network and Saskatoon Parole Services.
FASD with SFF: A possible diagnosis provided by the FASD Team; CNS impairment, simultaneous presentation of the 3 SFF and confirmed/unknown PAE.
FASD without SFF: A possible diagnosis provided by the FASD Team; CNS impairment, confirmation of PAE but no presentation of the 3 SFF.
Functional Screening Tool (FST): A 20-item functional assessment administered after the QFST, designed to identify the screened individual strengths and limitations (Perry, et al., 2008). The FST contains items on Wellbeing (7), Social Functioning (2), School/Employment (3), Antisocial/Criminal Issues (4) and Skills (4), and flags someone who scores at least 20 (out of a maximum of 40) for a complete FASD assessment.

Life History Screen (LHS): An FASD screen, with items on Childhood History (2), Maternal Alcohol Use (3), Education (4), Criminal History (2), Substance Use (2), Employment and Income (2), Living Situation (2), Mental Health (3) and Day-to-Day Behaviours (11) domains.
Negative Predictive Value (NPV): is the probability that a person who tests negative does not have the condition of interest. It was computed using the formula: true negatives / (false negatives + false positives) * 100.
Neurodevelopmental Domains: Domains assessed in the FASD diagnosis (i.e., neuroanatomy/neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation).
No Diagnosis (ND): A possible diagnosis provided by the FASD Team; no PAE, SFF and impairment on fewer than three our of the ten neurodevelopmental domains used to diagnose FASD.
Palpebral Fissure Lengths: Eye openings, measured in cm; the feature is present when a participant's eye openings (both eyes combined) average is 2 SD below the population mean (2.55 cm or less for adult males; 2.53 cm or less for females).
Philtrum Rank Score: The groove between the nose and upper lip, ranges from 1-5 on the University of Washington Lip-Philtrum 5-point scale; the feature is present when a participant scores 4 or 5 on the scale.
Prenatal Alcohol Exposure (PAE): Alcohol use by the birth mother.
Positive Predictive Value (PPV): The probability that a person who tests positive actually has the condition of interest. It was computed using the formula: true positives / (true positives + false positives) * 100.
Quick Functional Screening Tool (QFST): A 4-item brief screen administered prior to the FST, intended to screen for FASD.
Sensitivity (Se): How good a screen is at correctly identifying patients with condition of interest. It was computed using the formula: true positives / (true positives + false negatives) * 100.
Sentinel Facial Features: Palpebral fissure lengths / eye openings, Philtrum rank score / the groove between the nose and upper lip, and Upper lip rank score / width of upper lip.
Specificity (Sp): How good a screen is at correctly identifying the absence of a condition. It was computed using the formula: true negatives / (true negatives + false positives) * 100.
Upper Lip Rank Score: Width of upper lip, ranges from 1-5 on the University of Washington Lip-Philtrum 5-point scale; the feature is present when a participant scores 4 or 5 on the scale.

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Executive Summary

The Fetal Alcohol Spectrum Disorder (FASD) Pilot Program was initiated by the Regional Psychiatric Centre (RPC) to identify patients with Fetal Alcohol Spectrum Disorder and develop treatment recommendations to facilitate offenders' community release. In the initial year of the program, all RPC patients scheduled for community release between July 2018 and June 2019 for FASD were assessed and all inmate patients were provided institutional, transitional and community treatment recommendations. The University of Saskatchewan's Centre for Forensic Behavioural Science and Justice Studies was asked to conduct a process evaluation of the FASD Pilot Program.

Purpose of the Evaluation

The purpose of this evaluation is to identify the FASD diagnosis model used by the FASD Pilot Program to enable the development of a program model that could be implemented at other Correctional Services Canada (CSC) institutions to identify and treat patients with FASD. To this end, this evaluation aims to identify the procedures and functioning of the program, the roles and responsibilities in various stages of the program, the prevalence rate of FASD at RPC and cognitive profile of assessed participants, and the treatment recommendations provided by the FASD Program Team.

Methods

A mixed-method research design was used in the evaluation of the FASD Pilot Program. Participants of the pilot program were RPC patients with a Statutory Release or Warrant Expiry Date between July 1, 2018 and June 30, 2019. The data used in this evaluation was gathered from various sources including program documents, secondary program data, and interviews with the FASD Program's staff and stakeholders.

The analytic methods used in this evaluation were a literature review, document review, content analysis of the documents reviewed, a thematic analysis of the interviews conducted with the program staff and stakeholders, and statistical analyses of the assessment data (chi-square statistic, ANOVA test, and independent samples t-tests).

Findings

The FASD Pilot Program model included the internal RPC staff (i.e., social workers/clinical discharge planners, occupational therapists, psychologists, program officers, teachers, parole officers, correctional officer II, employment supervisors, Elders and Aboriginal Liaison Officers), RPC consultants (i.e., a psychiatrist and a neuropsychologist), and external stakeholders (i.e., Saskatoon area parole officers, Canadian Mental Health Association Saskatoon Branch, and the FASD Network).

The FASD diagnosis and treatment process observed in the pilot program consisted of seven stages: (1) intake and screening by the Program Coordinator, (2) comprehensive psychological

evaluation by the neuropsychologist, (3) Sentinel Facial Features measurement by the lead clinician psychiatrist, (4) assessment of life skills and needs by the occupational therapist, (5) clinic meeting with attendance by the whole FASD team, (6) communication of the diagnosis to patient by the clinical Coordinator and psychiatrist, and (7) the discharge planning completed by a social worker.

The pilot project generally followed the original diagnosis model which was based on the Canadian Diagnostic Guidelines for FASD (Cook et al., 2016). However, a few adjustments were made to the program design due to some time restrictions, ethical concerns, and participants' needs as observed by the FASD Team. These changes included non-implementation of institutional and transitional recommendations due to the time restrictions, providing treatment recommendations to all patients in the institutions and not limiting them to the program participants due to ethical considerations, inclusion of teachers on the FASD team, and shortening the final medical report to reduce redundancies and improve readability.

Thirty-one out of 34 patients who were approached by the FASD team participated in the program. While all 31 received a psychological assessment by the neuropsychologist, 25 participants completed an FASD assessment and FASD screening was completed for 22 patients. Slightly over three-quarters of the assessed participants were male, and 80% were Indigenous. The average age of assessed participants was 32.8 years. Based on the assessment findings, participants were categorized into four groups: (1) No diagnosis (ND; n = 3); (2) Complex Needs (CN; *n* = 10); FASD without Sentinel Facial Features (SFF; *n* = 9); and (4) FASD with Sentinel Facial Features (SFF; *n* = 3). Approximately half of Indigenous participants and a third of multi-racial participants were diagnosed with FASD for both the assessed sample and screened participant subsample. Female participants had a higher FASD rate than males (67% vs. 42%); however, this difference was not significant.

The data on the diagnosis process revealed the prevalence of FASD and its symptoms among the participants. Prenatal alcohol exposure (PAE) was confirmed by the mother or a relative of the patient in almost half of the assessed sample (45%). The three sentinel facial features were present in 100% of the FASD with SFF cases (*n* =3), and absent (0%) for the other diagnosis groups (ND, CN and FASD without SFF). Neurodevelopmental domain impairment was significantly higher for the FASD with SFF group, compared to the ND and CN groups. The screen subsample (*n* = 22) had a similar pattern of PAE, SFF and neurobehavioural domain impairment to the assessed cases (*n* = 25).

Five different screening tools were used in the pilot program to identify persons at high risk for FASD: Brief Screen Checklist-Revised (BSC-R), Life History Screen (LHS), Asante Youth Screen (AYS), Quick Functional Screening Tool (QFST), and Functional Screening Tool (FST). We analyzed whether the scores of the patients on these screening tools predicted the diagnosis of the participants in the pilot program. The AYS (86%) and QFST (77%) had the highest overall FASD accuracy rate. Both the AYS and QFST correctly identified all 10 participants with FASD. However, the AYS incorrectly flagged 3 persons as high risk for FASD, while the QFST incorrectly flagged 5 persons as high risk for FASD.

The FASD Program provided institutional recommendations to prepare the participant for release into the community. The recommendations included improvements related to diagnosis-specific issues to assist participants in improving their coping skills and life skills, providing cultural/religious services and mental health and addictions support, issues surrounding reintegration preparation, enhancement of the social services provided in the community, and enhanced connection with the parole officers.

The strengths, challenges, and lessons learned in the FASD pilot project were identified through interviews (n = 11) with program staff and stakeholders. A thematic analysis of the interviews indicated that the strengths of the program were having an interdisciplinary program team which consisted of experienced and passionate staff, the success of the program in reaching a sufficient number of clients and maternal confirmation of alcohol exposure, the evidence-based approach of the program model, the support provided by the RPC and the FASD Network, awareness of the importance of FASD among the stakeholders and staff, providing a diagnosis for the clients, the training sessions held for RPC staff, and the positive effects of the program on the patients.

The challenges of the program as perceived by the program staff and stakeholders were the difficulties in balancing the administrative roles of the staff and the project workload, occasional challenges in information sharing among different units and communication failures, having a contract (part-time) psychologist instead of a full-time psychologist, having a limited number of occupational therapists, and occasional lockdowns within the institution.

Conclusions and Recommendations

Based on the findings of the evaluation, recommendations are put forward to further support the FASD Pilot Program. The recommendations relate to the various aspects of the program including program management, staffing, training, the screening tools and instruments used in the program, data entry and collection strategy, information sharing, and stakeholder engagement.

Program Management and Staffing

- The program model needs to be documented in a way that reflects the importance of both diagnosis and treatment.
- FASD support team should consist of dedicated full-time staff which involves a psychiatrist, a psychologist, occupational therapists, a Coordinator, an assistant to the Coordinator, social workers, and nursing staff. Adequate number of staff dedicated to the program implementation needs to be ensured.
- In line with the Canadian FASD guidelines, the Program Coordinator should only coordinate the diagnosis and treatment process. To help with the administrative duties, an administrative assistant for the Coordinator needs to be hired.
- The goals of the program should be clarified in staff retreat activities and regular meetings.

- The staff working in RPC should receive more training on the meaning and implications of the FASD diagnosis, the domains of assessments, and the areas of support that the FASD clients need.

Screening Tools and Instruments

- Given the relatively higher accuracy rates of the AYS and QFST in predicting the FASD diagnosis, we recommend using these tools.
- As the accuracy rates of BSC-R, LHS, and FST are relatively lower, we recommend interpreting their results with caution.
- Word Memory Test (Green, 2003) can be added to the battery of standardized neuropsychological assessments to detect if participants are not trying to the full extent of their abilities when completing the assessments.

Data Collection

- The inclusion criteria need to be amended to allow the inclusion of inmates eligible for release in 2 years (rather than 1 year) to ensure that treatment plans can be implemented while patients are still in RPC.
- Program data tracking should be based on the needs of the program (i.e., to measure program effectiveness and efficiency, as well as to respond to changing program needs).
- Data entry should be done either concurrently with diagnosis and treatment, or routinely (e.g., monthly).
- If the FASD Program is expanded to other regional treatment centres (RTCs), a nation-wide method of tracking the program data on FASD should be developed and data should be collected consistently across the RTCs.

Information Sharing and Stakeholder Engagement

- To ensure that parole officers can access a copy of recommendations, they should be allowed to access participants' files via OMS and notified about a released inmate with FASD.
- To enhance the engagement of the stakeholders, the representatives of the community agencies who have key roles in the diagnosis, treatment, and engagement process of the FASD clients need to be included in the clinic meetings.
- Earlier notice about the release date of the patients needs to be given to the project team by the institution to ensure that the required services are made available for the client in the community when they are released.

Limitations

The following limitations should be kept in mind when reviewing the evaluation's findings:

- There was incomplete diagnosis data for six participants, four of which were transferred out of RPC prior to completing the FASD assessment.

- The statistics presented are based on non-random and small samples for assessed (n = 25) and screened participants (n = 22).
- There is a possibility of social desirability bias in the interview data because the respondents (i.e., staff and stakeholders) may have presented the program in a way to encourage its continuation of the program.
- RPC's inmate population consists of CSC inmates in the region who require psychiatric assessments/treatment and persons pending trials who need to be assessed for competency to stand trials. Therefore, the findings of the current evaluation are not generalizable to other CSC facilities.

1. Introduction

The University of Saskatchewan's Centre for Forensic Behavioural Science and Justice Studies was asked to conduct a process evaluation of the Regional Psychiatric Centre's (RPC) Fetal Alcohol Spectrum Disorder (FASD) Pilot Program, hereafter the FASD Program. The FASD Program was initiated to identify Regional Psychiatric Centre patients with Fetal Alcohol Spectrum Disorder and develop treatment recommendations to facilitate offenders' community release. To this end, the FASD Program assessed all RPC patients scheduled for community release between July 2018 and June 2019 for FASD, and provided institutional, transitional and community treatment recommendations for all inmate patients.

One of the stipulations of year 1 funding for the FASD Program was an independent evaluation to develop a program model that would be transferable to other Correctional Service Canada (CSC) institutions. In addition to helping the FASD Program formulate a program model to expand to other CSC facilities, this process evaluation aimed to determine the FASD Program model, identify the cognitive profile of inmate participants, identify the strengths and challenges faced by the program, and provide recommendations to strengthen the FASD Program. Data included in the current evaluation are a file review of program documents to identify the program model; diagnosis, FASD screen and treatment recommendations data for inmate participants assessed in the first year of the FASD Program; and interviews with key FASD Program staff and stakeholders.

Definition and Symptoms of FASD

FASD is a medical diagnostic term encompassing a range of lifelong physical, mental, behavioural and learning disabilities caused by prenatal exposure to alcohol (Cook, Green, Lilley, Anderson, Baldwin, Chudley, Conry, LeBlanc, Loock, Lutke, Mallon, McFarlane, Temple & Rosales, 2015; MacPherson, Chudley, & Grant, 2011; Public Health Agency of Canada, 2005). The most prevalent symptoms of FASD include growth deficiencies, facial anomalies, skeletal deformities, speech and language deficits, motor dysfunctions, lifelong learning and behavioural difficulties, and sleeping and eating irregularities (Popova et al., 2017). As a result of these symptoms, patients with FASD experience difficulties in their daily lives and need support to maintain a stable life.

Prevalence of FASD

Prevalence of FASD in the general population in Canada is estimated at between 1% (Cook et al., 2016; Public Health Agency of Canada, 2005) and 4% (Canada Research Network, n.d.). Although actual FASD prevalence rates in the correctional population are currently unknown, a study in one CSC Prairie Region facility diagnosed 10% of newly sentenced patients with FASD and diagnosis could not be ruled out in an additional 15% of patients (MacPherson et al., 2011). Other studies showed a high prevalence of FASD in different correctional populations in Canada, such as youth in forensic psychiatric services units in British Columbia and Yukon (23.4%; Fast et al., 1999), juvenile detainees in British Columbia (11.7%; Murphy et al., 2005), and youth sexual offenders in British Columbia (10.9%; Rojas & Gretton; 2007). Together, these figures

indicate a higher risk of criminal justice involvement for persons with FASD. In Canada, the yearly financial cost of FASD to the justice system is estimated at $1.2 billion (Flannigan et al., 2018).

Consequences of FASD for Forensic Patients

FASD symptoms have serious consequences for forensic patients. Neuropsychological deficits in judgement (e.g., inability to predict outcomes and impulsivity) put FASD individuals at greater risk of: (1) contact with the criminal justice system (Flannigan et al., 2018; Popova et al., 2011); (2) contact with the criminal justice system at a younger age (Pei et al., 2018); (3) making false confessions in interrogations and court defenses (Fast & Conry, 2004); and (4) higher recidivism post-incarceration (Flannigan et al., 2018). Youth with FASD are 19 times more likely to be incarcerated than youth without FASD (Popova et al., 2017). Further, there is a specific risk for FASD in Indigenous communities in Canada due to the high rates of alcohol use. It is estimated that the prevalence of alcohol use during pregnancy in Indigenous populations is three to four times higher than the general population, and approximately 20% of Indigenous women who consume alcohol during pregnancy engage in binge drinking while only 3% of non-Indigenous women do so (Popova et al., 2017).

Persons with FASD have different needs which must be addressed to reduce their criminogenic and recidivism risks (Andrews & Bonta, 2006; Andrews, Bonta & Wormith, 2006; Burke & Pei, 2018). Due to their disrupted neurocognitive development, individuals with FASD struggle with higher level tasks and skills such as inhibition, decision-making, working memory, integration of information, and cognitive flexibility (Burke, & Pei, 2018). These difficulties prevent persons with FASD from controlling their aggression and other antisocial behaviours especially in the presence of other risk factors such as intense emotions, illogical thoughts, or antisocial associates (Burden et al., 2009; Burke & Pei, 2018).

Diagnosis of FASD

In 2005, the first Canadian guidelines for the diagnosis of FAS and its related disabilities were developed by an international team of experts (Chudley et al., 2005). Cook et al. (2016) revised and updated these guidelines based on a comprehensive literature review and an international focus group study with 50 expert participants. The 2016 guidelines included recommendations on the screening, referral and support process for patients and mothers at risk of FASD, the medical assessment, the assessment of the sentinel facial features, the neurodevelopmental assessment, the nomenclature and diagnostic criteria, and diagnostic team members. Further, Cook et al. (2016) recommended a multidisciplinary team comprised of a physician, psychologist and speech-language pathologist/psychologist with expertise in language assessment be included in the FASD diagnosis process for adults, as the process required a complex assessment of both physical and neurodevelopmental symptoms (Cook et al., 2016).

There are two main challenges when attempting to diagnose FASD in adult clients: (1) the ability to confirm prenatal alcohol exposure of the mother is limited (e.g., due to death, or estranged family members); and (2) confounding factors such as traumatic brain injury and chronic alcohol

abuse might obscure the symptoms of FASD, thereby posing difficulties for the diagnostic team when distinguishing FASD from other disorders (Chudley et al., 2007; Fraser, 2011). For this reason, a comprehensive medical history review and clinical interviews by a physician or psychiatrist are required to rule-out other possible diagnoses.

Goals of the Evaluation

The FASD Program was initiated to identify Regional Psychiatric Centre patients with Fetal Alcohol Spectrum Disorder and develop treatment recommendations to facilitate offenders' community reintegration post-release from prison. As a stipulation of the Year 1 finding, CSC's Assistant Commissioner of Health Services mandated an evaluation of the Year 1 data in order to develop a program model that could be implemented in other CSC facilities. With this in mind, this process evaluation examined the first year of the FASD Program (July 1, 2018 - June 30, 2019) to accomplish the following goals:

1. Identify the FASD diagnosis model used by the FASD Program;
2. Determine the FASD prevalence rate at RPC and cognitive profile of assessed participants;
3. Assess the FASD Program Team's treatment recommendations; and
4. Examine the procedures and functioning of the FASD Program to develop a program model that could be implemented at other CSC institutions to identify and treat the institutional CSC inmate population for FASD.

Chapter 2 of this report describes the methods used to accomplish the evaluation goals, and includes the evaluation questions, data collection techniques, analysis strategy and limitations of the evaluation. Evaluation goal 1 is presented in Chapter 3, which describes the FASD Program model, including the diagnosis process and role of the FASD Team (i.e., program staff and stakeholders). Chapter 4 describes the FASD Program participants and focuses on evaluation goals 2 and 3. Secondary data analysis of patients assessed by the FASD Program was used to identify the FASD prevalence rate in RPC and the neurodevelopmental profile of assessed patients. In addition to conducting an FASD diagnosis, the FASD Program also administered 6 FASD screens—Brief Screen Checklist-Revised, Life History Screen, Asante Youth Screen, Quick Functional Screening Tool, Functional Screening Tool and Brief Screen Index—which are also described in Chapter 4. Chapter 5 presents the findings of the thematic analysis of the FASD staff and stakeholder interviews, which give detailed information about the program's procedures and functioning, as well as roles and responsibilities in various stages of the program as proposed in goal 4. In addition, Chapter 5 also includes the recommendations of the RPC staff regarding treatment plans and how the program could be implemented at other institutions, which also corresponds with goal 4. Finally, Chapter 6 outlines our recommendations for CSC, including a model that can be expanded to other CSC facilities, which speaks to the fourth evaluation goal.

2. Methods

This section describes the process evaluation methods, including the purpose of the evaluation and the evaluation questions. A mixed methods strategy—including a file review, secondary program data analysis and interviews with program staff and stakeholders—was used to answer the evaluation questions. The chapter ends with a discussion of the limitations of the study. This study was approved by the University of Saskatchewan Biomedical Research Ethics Board (see Appendix A).

Evaluation Questions

In addition to the goals of the evaluation, the following evaluation questions guided the project design and analysis strategy:

1. What process(es) does RPC's FASD team use to diagnose patients?
    a. What are the criteria at each decision point; that is, what are the decision rules?
    b. What data are captured at each decision point?

2. Using a 1 year cohort of RPC patients scheduled for release between July 1, 2018 and June 30, 2019, what is the extent of FASD in RPC?
    a. What is the rate of Prenatal Alcohol Exposure (PAE), Sentinel Facial Features (SFF) and neurobehavioural domain impairment among assessed participants?
    b. Do PAE, SFF and neurobehavioural domain impairment rates differ by diagnosis outcomes?

3. What institutional, transitional (discharge preparation), and community level (post-release) treatment plans were created by the FASD Team (i.e., program staff and stakeholders)? [1]
    a. How do treatment recommendations differ by diagnosis outcomes?
    b. To what extent were the FASD Team's recommended plans implemented at RPC?

4. How can the lessons learned from the pilot project facilitate FASD program implementation at other CSC facilities?
    a. What are the perceived strengths of the program?

[1] The evaluation proposal submitted to CSC included staff perception of the impact of the diagnosis process on patients and analysis of assessed patients' pre-and post-diagnosis incident data. The latter was ultimately omitted from the evaluation due to patients' brief post-diagnosis period within RPC. Attempts were made to obtain secondary incident data to compare assessed patients to other RPC patients to test the hypothesis that patients with FASD are more likely to have problems abiding by institutional rules, compared to patients without FASD. Although the data files were produced, the Commissioner did not approve their release to the evaluation team prior to completion of this report.

b. What lessons did the FASD Program Team learn from the first year of operations?
c. How can the diagnostic process be improved?
d. How can the program model be improved?

Data Sources

Several data sources were used to answer the evaluation questions. Data sources included program documents, secondary program data, and interviews with the FASD Program's staff and stakeholders. The data sources used in this evaluation are described below.

Program Documents

A review of program documents was used to identify the program model (including the diagnosis process and decision points in the diagnosis process), determine changes to the program model over the first year of implementation, create the staff and stakeholder interview guide, and formulate a strategy to expand the program to other CSC facilities. Additional information/clarification on program materials was solicited from the Coordinator, when needed.

The following program materials were included in the document review:

1. FASD Program Proposal outlining the project's Terms of Reference (TOR), which was submitted to Health Services for approval on February 8, 2018.

2. A gap analysis of the Bowden Institution's FASD Pilot, conducted by the FASD Team, also submitted to Health Services on February 8, 2018, to support the project proposal.

3. Briefing notes sent to the Assistant Commissioner of Health Services. The initial request for funding included a briefing note to the Assistant Commissioner of Health Services dated February 8, 2018. Other Assistant Commissioner of Health Services briefing notes provided to the evaluation team were dated December 3, 2018 and January 7, 2019.

4. Email communicating approval of the FASD Program, with Health Services funding $295,600.00, dated Friday, March 23, 2018.

5. Clinic meeting notes dated February 1, 2018; February 8, 2018; April 5, 2018; April 19, 2018; May 3, 2018.

6. FASD screens. The FASD Program provided e-copies of the screens used by the program: Brief Screen Checklist-Revised, Life History Screen, Asante Youth Screen, Quick Functional Screening Tool, Functional Screening Tool and Brief Screen Index.

7. Inmate consent forms for participation in a CSC program (blank).

8. Participants' final medical reports. A final medical report is prepared for each participant who consents to the FASD program, which includes the members of the FASD Program who attended the clinic where the specific participant's diagnosis is determined, a summary of the neuropsychologist's report, measurements of the participant's Sentinel Facial Features (SFF), and the participant's diagnosis and treatment recommendations. A copy of the medical report is uploaded unto the CSC Health File and is accessible to health staff at other CSC facilities; a copy is also given to the participant. To protect participants' confidentiality, medical reports were reviewed onsite at the Regional Psychiatric Centre. Copies of the treatment recommendations were de-identified and analyzed remotely on a secure University of Saskatchewan laptop computer.

9. A review of decks—PowerPoint presentations—made by the FASD Program dated January 8, 2019 and an (unpresented) Health Services deck intended to be presented to the Health Services Executive Team (HSET).

Secondary Electronic Program Data

Secondary data from the FASD Program participants—patients at the Regional Psychiatric Centre scheduled for release to the community between July 1, 2018 and June 30, 2019 who consented to participate in the program and completed the diagnosis process (n=25)—were also analyzed in this evaluation.[2] Secondary data included data used in the FASD assessment (items 1-3 below), and data used to screen for FASD (item 4, below):

1. **Demographics and medical history** (e.g., Prenatal Alcohol Exposure [PAE], historic diagnoses, drug use history). PAE was coded as confirmed, unknown/unconfirmed or absent. Medical history was not analyzed in detail, but referenced against self-report screen data (See item 4 below).

2. **Measurements of the three Sentinel Facial Features (SFF) used in FASD diagnosis** (i.e., Palpebral fissure lengths / eye openings, Philtrum rank score / the groove between the nose and upper lip, and Upper lip rank score / width of upper lip). Consistent with the Canadian FASD diagnosis guidelines (Cook et al., 2016), SFF were coded as present when the palpebral fissure length was at least two standard deviations (SD) below the population mean (adult males combined average for both eyes = 2.55 cm or less, and adult females combined average for both eyes = 2.53 cm or less); philtrum rank was scored as 4 or 5 on the University of Washington Lip-Philtrum 5-point scale; and upper lip rank was scored as 4 or 5 on the University of Washington Lip-Philtrum 5-point scale. There must be simultaneous presentation of all three features for SFF to be coded as present (yes / no). Palpebral fissure lengths, philtrum and upper lip measurements were also measured in centimeters.

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[2] Data entry was completed by the first author and FASD Coordinator in September 2019. As an accuracy check, syntax was used to score the FASD screens and matched against the hard-copy scores. The first author and FASD Coordinator checked all data entry items against the hard-copy program documents as a final accuracy check.

3. **Neurodevelopmental domains assessment data used in the FASD diagnosis** (i.e., neuroanatomy/neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation). Impairment of a neurobehavioural domain occurs when the participant scores 2 SD below the mean, where the mean and SD are based on community population rates. Neurobehavioural domains were coded as impaired, not impaired or not assessed.

4. Self-reported data from participants for the following FASD screens, which are intended to flag/identify individuals for a complete FASD assessment:

    a) **Brief Screen Checklist-Revised** (BSC-R; *n* = 22). MacPherson, Chudley and Grant (2011, pp. 75-80) designed the Brief Screen Checklist based on a literature review, a review of FASD screening tools and consultation with experts. They revised the screen into the BSC-R after conducting a pilot test on a sample of 91 offenders age 30 or younger, beginning a new federal custodial sentence in Winnipeg between March 2005 and September 2006 (MacPherson, Chudley & Grant, 2011). The pilot study included an FASD assessment, consistent with the 2005 Canadian FASD guide (Chudley et al., 2005), to assess for accuracy of the BSC. The BSC-R (MacPherson, Chudley & Grant, 2011, pp 126-130) is a 36-item scale, broken down into Behavioural Indicators (26), Historical Indicators (4) and Maternal Indicators (6). The BSC-R flags persons with following for a complete FASD assessment:
        i. Score of 10 or higher on Behavioural Indicators, AND
        ii. Score of 2 or more on Historical Indicators, AND
        iii. Responses of "at least twice a week" for frequency of mother's drinking OR "four or more drinks per occasion" for the number of mother's intake on a typical drinking occasion.

    b) **Life History Screen** (LHS; *n* = 22). Grant et al. (2013) used data from 549 women enrolled in the Washington State Parent-Child Assistance Program between November 1997 and July 2011 to construct the LHS to identify persons who require additional testing for FASD and treatment modification for cognitive impairments and learning difficulties. Rather than administering the LHS, Grant et al (2013) modified items from the Addiction Severity Index (McLennan et al., 1992) to create the LHS. Grant et al. (2013) pilot tested the tool for accuracy using an FASD diagnosis by a qualified clinician or FASD multidisciplinary team. The FASD Program used an updated version of the LHS, which was broken down into Childhood History (2), Maternal Alcohol Use (3), Education (4), Criminal History (2), Substance Use (2), Employment and Income (2), Living Situation (2), Mental

Health (3) and Day-to-Day behaviours (11) domains. The LHS flags persons[3] with the following for a complete FASD assessment:

i. Red flags on all 3 Key Life History Domains—Childhood History, Maternal Alcohol Use and Day-to-Day Behaviours, OR
ii. Red flags on 2 Key Life History Domains AND at least 2 red flags on Other Life History Domains—Education, Criminal History, Substance Use, Employment and Income, Living Situation, and Mental Health.

c) **Asante Youth Screen** (AYS; *n*=22). The Asante Centre for Fetal Alcohol Syndrome created the FASD Screening Tool and Referral Form for Youth Probation Officers, hereafter the Asante Youth Screen, to assist probation officers in identifying youth on their caseloads who require an FASD diagnostic assessment (Conry & Asante, 2010). The screen consists of 10 items on Social Factors (5) and Personal Factors (5), to be completed by the probation/parole officer based on information obtained from the birth mother, birth records, maternal grandparents/aunts, social workers' records and parents' partners (Conry & Asante, 2010). The AYS guide recommends verifying self-report data (from the youth). Items were created based on the 2005 Canadian FASD guidelines (Chudley et al., 2005), and have not been tested for accuracy against a completed FASD assessment. The AYS flags youths with the following scores for a complete FASD assessment:

i. One Social Factor AND 2 or more Personal Factors, OR
ii. No Social Factors AND 3 or more Personal Factors.

d) **Quick Functional Screening Tool** (QFST; *n* = 22). The QFST and FST were developed by several clinicians—Garry Perry, Garry Prediger, Patricia Blakley and Coralee Pringle-Nelson—both to identify persons who may require a complete FASD assessment and to guide service delivery. The QFST is a 4-item brief screen administered prior to the FST, intended to screen for FASD (i.e., the tool developers first goal; Perry, et al., 2008). The FASD Program administered version 5 of the QFST (and FST), which flags someone who scores one or more (out of a maximum of 8) for a complete FASD assessment.[4]

e) **Functional Screening Tool** (FST; *n* = 22). The FST is a 20-item functional assessment administered after the QFST, designed to identify the screened individual's strengths and limitations (Perry, et al., 2008). The FST contains items on Wellbeing (7), Social Functioning (2), School/Employment (3), Antisocial/Criminal Issues (4) and Skills (4), and flags someone who scores at least 20 (out of a maximum of 40) for a complete FASD assessment.

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[3] Grant et al (2013) identified 5 or higher as the cut-off score for FASD diagnosis referral (AUC=.68; sensitivity=.81%; specificity=.66%). The FASD Program used the more recent scoring system provided by the tool developers in 2018, outlined above.

[4] One of the tool developers, Garry Prediger, provided the decision rule for the QFST and FST in email correspondence dated Friday, November 1, 2019. The decision rule is not included in version 5 of the tool (Perry, et al., 2008), which was used by the FASD Program.

f) **Brief Screen Index** (BSI; n=20). The BSI was created after consultation with experts in the field of FASD and contains items on Maternal Health (3), Childhood System (social, mental health and criminal justice) Contacts (3), Criminal History (3), Dependent living in Adulthood (3), Childhood Foster Placements (3), Health History (3), Substance Use (3), and Impulsivity (3). Items were created based on the most recent Canadian FASD guidelines (Cook et al., 2016) and have not been tested for accuracy against a completed FASD assessment or administered to a previous sample. Therefore, the tool has not defined a decision rule or cut-off score to flag screened individuals for a complete FASD assessment.

FASD Assessments versus Screens

An FASD assessment is a conclusive diagnostic test, consistent with the prevailing Canadian guidelines (Cook et al., 2016), while the screens used by the FASD Program identify or flag individuals who are at a high-risk for FASD. Generally, screens flag individuals at-risk for a specific outcome: they are not intended to replace the diagnostic assessment, but instead are meant to identify/flag persons who require further testing (Conry & Asante, 2010; Grant et al., 2013; Trevethan, 2017). Screens are imperfect predictors as persons flagged for further testing may be diagnosed as negative, while persons not flagged for testing (i.e., low-risk) may be diagnosed with the condition (Conry & Asante, 2010; Grant et al., 2013; Trevethan, 2017). The reference standard (occasionally referred to as the "gold standard") to determine the outcome variable (i.e., the dependent variable) used to assess the accuracy of a health screen is typically the prevailing standard for diagnosis of the specific health condition (Trevethan, 2017). The BSC-R, QFST and FST used the 2005 Canadian FASD guide (Chudley et al., 2005) as their reference standard; the LHS used the prevailing American FASD diagnosis standard in 2013 (see Hoyme et al., 2005); and no outcome variable/reference standard was used for the AYS and BSI. The FASD Program used the current Canadian FASD guidelines (Cook et al., 2016) as the reference standard, which is presently the most appropriate reference standard to validate FASD screens. Techniques for assessing the accuracy of risk screens are discussed further in the analysis strategy section of this chapter.

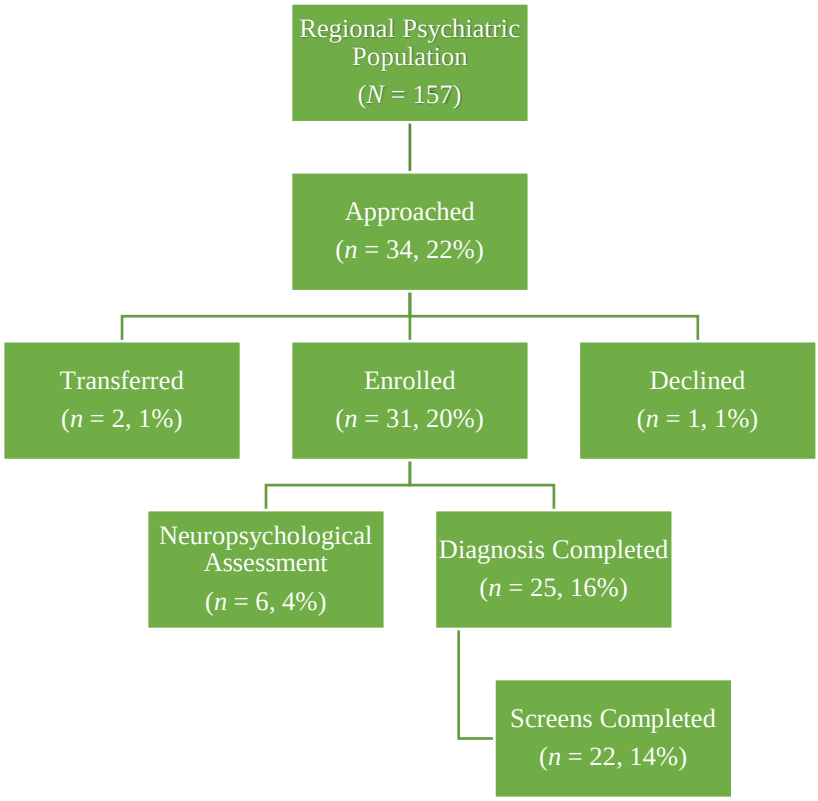
Participants

FASD Program Participant Recruitment

RPC patients with a Statutory Release or Warrant Expiry Date between July 1, 2018 and June 30, 2019 were eligible to participate in the FASD Program. In year-1 of the program, the FASD Program Coordinator invited 34 RPC patients to participate in the program (see Figure 1). Of those, 2 patients were transferred prior to starting the FASD assessment, 1 declined and 31 enrolled in the program. While all 31 received a psychological assessment by the neuropsychologist, only 25 participants completed an FASD assessment (see Chapter 3 for a detailed description of the assessment process used by the FASD Program). Three of the assessed participants did not complete all FASD screens with a decision rule—Brief Screen

Checklist-Revised, Life History Screen, Asante Youth Screen, Quick Functional Screening Tool, Functional Screening Tool—and only 20 completed the Brief Screen Index.

Figure 1. FASD Program Participant Recruitment



Note. The category "Psychological Assessment" includes 4 persons who were transferred to another institution and 2 persons who were waiting for their medical assessment and final clinic to be completed.

Participant Evaluation Groups

The current study used evaluation groups based on the Canadian guidelines for FASD (Cook et al., 2016), with two exceptions—since the sample was drawn from adult patients, two diagnosis outcomes that may be conferred on infants and children, (1) Developmental Care as Needed, and (2) At Risk for Neurodevelopmental Disorder and FASD, were not used by the FASD Program.

Assessed participants (n = 25) were assigned to one of the four following groups:

1. **No Diagnosis** (ND; n = 3): Prenatal Alcohol Exposure (PAE) may be confirmed, unconfirmed/unknown or absent, and three Sentinel Facial Features (SFF) may or may not be present, provided assessed participants had impairments on fewer than three neurodevelopmental domains (i.e., did not have Central Nervous System [CNS] impairment).

2. **Complex Needs** (CN; *n* = 10): Assessed participants with CNS impairment but without SFF. PAE may be unconfirmed or absent.

3. **Fetal Alcohol Spectrum Disorder without Sentinel Facial Features** (FASD without SFF; *n* = 9): Assessed participants with CNS impairment, confirmed PAE, and without SFF.

4. **Fetal Alcohol Spectrum Disorder with Sentinel Facial Features** (FASD with SFF; *n* = 3): Assessed participants with CNS impairment, confirmed or unconfirmed PAE, and with SFF (3 SFF present).

Three assessed participants did not complete the FASD screens with a decision rule (note: screens are not part of the diagnosis process; they are used to identify the most appropriate persons for further testing). Analysis on the FASD screens (*n* = 22) with a decision rule used the following sub-sample (defined above):

1. No Diagnosis (ND; *n* = 3)
2. Complex Needs (CN; *n* = 9)
3. Fetal Alcohol Spectrum Disorder (FASD; *n* = 10)–the following two FASD diagnosis were combined into one FASD group:
   a) FASD without Sentinel Facial Feature (FASD without SFF; *n* = 8)
   b) FASD with Sentinel Facial Feature (FASD with SFF; *n* = 2)

FASD Team (Staff and Stakeholder) Interviews

In May 2019, the FASD Program Coordinator provided a list of internal RPC staff (*n*=20), RPC consultants (*n*=2), Saskatoon Parole (*n*=2), and other stakeholders involved in the program (*n*=2). Nine RPC staff members were excluded from the study due to their limited involvement in the FASD Program, and the remaining staff and stakeholders were emailed interview invitations in June 2019. Eleven invitations were accepted and interviews were conducted in June and July 2019 (a twelfth prospective interviewee initially accepted the invitation but did not participate in the evaluation), primarily by the lead author. To protect interviewees' confidentiality, interviews were conducted either in-person at a secure room at the University of Saskatchewan, or on the telephone, after consent was obtained (see Appendix B for a copy of the consent form and Appendix C for a copy of the interview guide). This information is summarized in Table 1. We reached two of the participants after the interview by phone and email for further information and follow up discussions.

Interviewees were asked about their role in the FASD Program; the diagnosis process and changes to the diagnosis process during the program (omitted for interventions staff and stakeholders); disagreements in the final diagnosis among team members; the perceived impact of the program on participants; strengths, challenges and lessons learned from the program; and suggestions to successfully expand the program to other CSC institutions. Interviews with team members involved in making the final diagnosis and treatment recommendations lasted about an hour in duration, while interviews with the team members involved in the initial intake and

screening, diagnosis and skills assessment process (i.e., the Coordinator, Psychiatrist, Neuropsychologist and Occupational Therapist) lasted approximately 2 hours. Interviews were audio-recorded, with permission from the interviewee, and transcribed in July-September 2019. The transcriptionist was not provided with interviewees' names or identifying information.

Table 1. Interviewee List

Interviewee	Staff / Stakeholder
1. Lead Clinician/psychiatrist	RPC Consultant
2. Program Coordinator/nurse	RPC staff
3. Administrative Assistant	RPC staff
4. Neuropsychologist	RPC Consultant
5. Occupational Therapist	RPC staff
6. Psychologist	RPC staff
7. Social Worker	RPC staff
8. Clinical Social Worker	RPC staff
9. Community Mental Health Specialist	External Stakeholder
10. Senior FASD Network member	External Stakeholder
11. FASD Network staff member	External Stakeholder

Analytic Strategy

This section explains the techniques used to analyze the data collected for this evaluation. For clarity, analytic techniques are organized by the four evaluation goals (EG) listed at the end of Chapter 1.

EG 1: Identify the FASD Program model

1. **Literature review.** The Canadian FASD guidelines (Cook et al., 2016) were used to describe the diagnosis process. A copy was provided by the FASD Program Coordinator, to explain the program's diagnostic criteria. FASD diagnosis procedures described in other studies were also used to identify the correct terminologies, decision rules and protocols typically used to diagnose FASD (e.g., Grant et al., 2013; Forrester et al., 2015; MacPherson et al., 2011; Mullins et al., 2014).

2. **Document review.** Materials related to the setup and administration of the program (e.g., program proposal, gap analysis justifying the program proposal, diagnosis flow chart, emails, memos, meeting agendas, meeting minutes, and briefing notes to CSC Assistant Commissioner–Health Services) were used to identify the program model and the diagnosis process, which is presented in Chapter 3. The document review was also used to design the staff and stakeholder interview guide and create recommendations to aid in program continuity and team cohesion.

3. **Content analysis.** Staff and stakeholder (FASD Team) interviews were analyzed using content analysis to determine decision points, the criteria for each decision point and which data is captured at each decision points. Rather than using a simple word count,

interviews were analyzed for consistency in descriptions of the program model and used to corroborate the model revealed by the program documents (for a description of the various techniques used in content analysis, see Stemler, 2000). Follow-up emails with the Program Coordinator and Neuropsychologist were used to clarify any inconsistencies between the program documents and interviewees' description of the program model (see Chapter 3 for a description of these roles and the program model).

EG 2a: Determine the FASD Prevalence rate and cognitive profile of assessed participants.

Secondary participant PAE, SFF and neurodevelopmental domain impairment data were compared for the four diagnosis outcome groups—ND, CN, FASD without SFF and FASD with SFF—for all assessed participants (n=25) and screened participants (n=22). Statistical analysis was conducted using the IBM Statistical Package for the Social Sciences (SPSS) version 24.

1. ***Chi square statistic*** was used to compare differences in categorical variables (PAE, SFF yes/no, and neurodevelopmental domain impairment) for the four diagnosis groups.

2. ***ANOVA test*** was used to compare average differences in continuous variables—palpebral fissure length (cm), inner canthal (cm), philtrum rank (1-5), upper lip rank (1-5), IQ, and neurodevelopmental domains—for the four diagnosis groups. The F-statistic and Bonferroni post-hoc were used to describe mean differences between the groups when the equal variance assumption was not violated (Levene's p-value > .05); the Welch F-statistic and Games-Howell post-hoc test were used to describe mean differences between the groups when the equal variance assumption was violated (Levene's p-value ≤ .05). The F and Welch F are used to determine if at least one group mean is significantly different from the other group means, while post-hoc tests identify exactly which group averaged are significantly different (Field, 2009).

3. ***Independent samples t-tests*** were used to determine differences in group means for two groups, for example, differences in age for male and female participants (Field, 2009).

EG 2b: Determine the accuracy rates of the FASD screens.

Secondary participant screen data were analyzed individually to determine significant group differences for each item on the relevant screen (n = 22 for the BSC-R, LHS, AYS, QFST and FST; n = 20 for the BSI). The intent of this analysis was to identify items on each screen that had different responses for the outcome groups—ND, CN and FASD (which combined the FASD without SFF and FASD with SFF groups).

1. ***Chi square statistic*** was used to compare differences in categorical items on the screens for the three diagnosis groups for screened participants.

2. ***ANOVA test*** was used to compare average differences in continuous items on individual screens for the three diagnosis groups for screened participants. The F-statistic and Bonferroni post-hoc were used to describe mean differences between the groups when the

equal variance assumption was not violated and the Welch *F*-statistic and Games-Howell post-hoc test were used to describe mean differences between the groups when the equal variance assumption was violated (Field, 2009).

3. ***Accuracy rates*** were compared for the tools with a decision rule—the BSC-R, LHS, AYS, QFST and FST—for screened participants (n = 22). The reference/gold standard used to determine accuracy rates for the tools was the diagnosis by the FASD Team, using the current Canadian FASD guidelines (Cook et al., 2016). Since RPC was interested in using the FASD screens to identify persons (1) at-risk for FASD and (2) at-risk for both FASD and CN, the following accuracy statistics were computed for both predictions (see Table 2 for the summary of screen accuracy computation and Appendix F for detailed explanation of the computation):

    a. **Overall correct prediction rate.** Usually this is computed using receiver operating characteristics (ROC) analyses, whereby an Area under the Curve (AUC) ranges from 0-1. An AUC of .5 is as good as flipping a coin and tools with AUCs that are closer to 1 are better overall predictors of the outcome. Due to the small sample size, overall prediction was computed manually using the formula: (true positives + true negatives) / total cases * 100.

    b. **Positive predictive value (PPV).** PPV is the probability that a person who tests positive actually has the condition of interest (Trevethan, 2017). It was computed using the formula: true positives / (true positives + false positives) * 100.

    c. **Negative predictive value (NPV).** NPV is probability that a person who tests negative does not have the condition of interest (Trevethan, 2017). It was computed using the formula: true negatives / (false negatives + false positives) * 100.

    d. **Sensitivity (Se).** Se is defines as how good the test is at correctly identifying patients with condition of interest (Trevethan, 2017). It was computed using the formula: true positives / (true positives + false negatives) * 100.

    e. **Specificity (Sp).** Sp is defined as how good the test is at correctly identifying the absence of a condition (Trevethan, 2017). It was computed using the formula: true negatives / (true negatives + false positives) * 100.

Generally, clinicians are more concerned with PPV and NPV, or how accurate a screening tool is at predicting persons with and without the medical condition, respectively (Trevethan, 2017), and are less interested in Se and Sp. Programs may also have different goals, which will influence which accuracy statistics are most pertinent to its decision making. For example, a program that wishes to provide treatment to as many persons with the condition as possible, may rank a screen with the highest PPV as being more useful compared to a screen with the highest overall accuracy.

Table 2. Screen Accuracy Computation Summary

FASD				ACCURACY VALUE	COMPUTATION
	FASD	no FASD	Total	Se	[a/(a+c)] * 100
High risk	a	b	a+b	Sp	[d/(b+d)] * 100
Low risk	c	d	c+d	PPV	[a/(a+b)] * 100
Total	a+c	b+d	a+c+b+d	NPV	[d/(c+d)] * 100
				Overall Correct	[(a + d) / (a+c+b+d) * 100
FASD & Complex Needs				ACCURACY VALUE	COMPUTATION
	FASD/CN	ND	Total	Se	[a/(a+c)] * 100
High risk	a	b	a+b	Sp	[d/(b+d)] * 100
Low risk	c	d	c+d	PPV	[a/(a+b)] * 100
Total	a+c	b+d	a+c+b+d	NPV	[d/(c+d)] * 100
				Overall Correct	[(a + d) / (a+c+b+d) * 100

Note. a=true positive or the number of participants classified as high-risk who were diagnosed with the condition; b=false positives or the number of participants classified as high-risk diagnosed without the condition; c=false negatives or the number of low-risk participants who were diagnosed with the condition; and d= the number of participants classified as low-risk who were diagnosed without the condition (Trevethan, 2017).

EG 3: Assess the FASD Team's recommendations

Content analysis was used to analyze treatment recommendations from participants' final medical record to determine what institutional, transitional, and community treatments were usually recommended by the FASD Team. This included both a word/phrase frequency count, including synonyms, whereby the consistency of meaning was prioritized over the actual words/phrases used. Words/phrases with similar meanings were grouped together, and coding categories were mutually exclusive (Stemler, 2000). Emergent coding was used to identify coding categories and subcategories, which means the data was allowed to speak for itself and no prior theoretical framework was used to generate codes (Stemler, 2000). Treatment recommendations were read three times to determine coding categories and subcategories, and subsequently coded and tallied. Due to the small participant sample size (n = 25), no software was used for this content analysis and only one reader was used to generate the coding scheme. These results, along with EG 2, are presented in Chapter 4. Sample: Diagnosis, Screening and Treatment.

EG 4: Examine the procedures and functioning of the FASD Program todevelop a model for implementation at other CSC facilities

1. ***Thematic analysis.*** FASD Team interviews were analyzed using thematic analysis, to identify program strengths and challenges, and lessons learned from the first year of the operations, using the following process (Braun & Clarke, 2006; Caulfield, 2019):
   a. **Learning the data.** The leader author read the FASD Team interview transcripts to become familiar with the data.

   b. **Coding.** The transcripts were read a second time to code and highlight important sections of the transcribed interviews. Inductive approach was used to generate themes and subthemes, that is, the interviews were used to identify themes.

   c. **Generating themes/subthemes.** Codes/subthemes were then organized into broad themes/categories.

   d. **Reviewing themes for accuracy.** The transcripts were read a third time to verify coding accuracy and select appropriate excerpts for the write-up and discussion.

   e. **Naming themes.** Themes were named to be both brief and descriptive

   f. **Write-up.** Based on the themes identified through the thematic analysis, the strengths and challenges of the program as well as lessons learned are presented in Chapter 5.

2. ***Literature review.*** Technical reports and academic publications on best practices in program development and implementation were reviewed to develop appropriate recommendations for the FASD Program to strengthen the program and for CSC to formulate a plan to implement an FASD Program at other institutional facilities. These results, along with the recommendations generated from all previous analyses are presented in Chapter 6. The data sources and analytic techniques used to accomplish the evaluation goals are summarized in the evaluation matrix (Appendix D).

Changes to the Original Evaluation Design

Two planned data collection techniques were dropped from the final evaluation. First, the process evaluation initially included a review of assessed patients' case plans (EG 3) to determine the extent to which the recommended treatment plans were implemented for the four diagnosis outcome groups (ND, CN, FASD with SFF and FASD without SFF). However, due to the brief time between FASD assessments and patients' discharge from RPC, there was insufficient time to implement institutional and transitional plans. Instead, the process evaluation included a file review of recommended institutional, transitional and community treatment plans, as no changes were implemented in patients' institutional and transitional case plans.

Second, the process evaluation originally included an analysis of institutional incident data to determine (a) whether patients with FASD had higher rates of incidents and more serious

incidents, compared to the general prison population, and (b) whether assessed patients had fewer or less serious incidents after their FASD assessment and implementation of their recommended treatment plan. Institutional incidents may be referred to as misconduct, disciplinary incidents, or infractions in corrections literature. A data request for the institutional incident data was submitted to CSC-National Headquarters Research Branch in August 2019. However, the evaluation team was unable to obtain the requested incident data in time to include in this report.

Limitations of the Evaluation

Quantitative Data Limitations

Due to the limitations outlined below, quantitative results are not generalizable to the RPC population or the wider CSC incarcerated population. Instead, quantitative results describe the assessed sample and screened participant subsamples.

Non-Participation and Incomplete Data

There was incomplete diagnosis data for six participants, four of which were transferred out of RPC prior to completing the FASD assessment. In addition, two persons transferred prior to being enrolled in the program and one declined to participate. It is possible that the eligible participants who did not participate in the program had different demographic or neurodevelopmental domain scores compared to the sample (n = 25).

In addition, there was incomplete screen data for three participants. The screened patients' subsample (n = 22) had a slightly higher proportion of males (82% vs 76% of all assessed patients), was slightly younger on average (33 vs. 32.8 years) and had a slightly lower FASD rate (46% vs. 48%) compared to all assessed patients.

Finally, some of the data collected by the Psychiatrist was unavailable or inconsistent (e.g., for neuroanatomy / neurophysiology measurements, the actual measurements and decision rule for males vs. females) in the final medical report or hardcopy patient records maintained by the Coordinator. The Psychiatrist maintained personal records of these measurements. Instead, the Psychiatrist's diagnosis was provided for in the evaluation materials. Therefore, no analysis could be presented on height, weight or brain circumference measurements for male and female participants: quantitative analysis was limited to program data available in the final medical report and hardcopy patient records maintained by the FASD Coordinator.

Non-Routine Data Entry

Data entry was completed by the lead author and the FASD Coordinator in September 2019, at the end of the first year of the program. Due to time constraints, data entry was completed in one week. Attempts were made to confirm the accuracy of the data (e.g., the lead author and the FASD Coordinator both checked the data file against the hardcopy patient files; syntax was used

to confirm screen scores). It is possible that routine program data entry by the FASD Coordinator and/or Administrative Assistant would have resulted in more accurate data entry.

ANOVA Assumptions

The equal variance assumption of the ANOVA *F* statistic was violated in several of the presented results in Chapter 4. When the equal variance assumption if the *F* statistics was violated (Levene's $p \leq .05$), the Welch *F* statistic and Games-Howell post-hoc test were presented instead. However, the Welch *F* statistic cannot be produced when there is zero variance in at least one group mean—when this occurred, it was noted in the results tables presented in Chapter 4.

Sample Size

Due to the small sample size of patients assessed in year one of the FASD Program, the minimum cell counts assumption was violated for all chi-square tests (at least 5 per cell) reported in Chapter 4. All chi-square results should be interpreted with caution.

Non-Random Sample

Finally, it should be noted that the statistics presented are based on non-random and small samples for assessed ($n = 25$) and screened participants ($n = 22$ participants completed the BSC-R, LHS, AYS, QFST and FST; $n = 20$ participants completed the BSI).

Interview Data Limitations

The staff interview data analysis results presented in Chapter 5 had the following limitations:

Social Desirability Bias

Since this was a pilot project, respondents may have presented the program in a way to encourage its continuation. Therefore, there is a possibility of social desirability bias in the interview data. In addition, CSC staff were divided into (1) Operations: correctional officers, including supervisory officers; (2) Interventions: parole officers and program officers that deliver core programming; the Chaplain; Elders and Aboriginal Liaison Officer who deliver cultural supports; and supervisors of employed patients (e.g., in food services, housekeeping or grounds maintenance); and (3) Clinical: health care and mental health staff (e.g., social workers, psychologists, psychiatrists, general practitioners, nurses, and occupational therapists). The FASD Team included RPC staff from all three divisions. However, clinical RPC staff were most likely to attend clinic meetings where the FASD Team determined participants' diagnosis and treatment recommendations (e.g., at least one Social Worker or Discharge Planner attended all twenty-five clinic meetings, the Occupational Therapist attended twelve, RPC Psychologists attended six), compared to interventions (e.g., Parole Officers attended seven, an RPC Teacher attended three and a Program Officer attended one clinic meeting) and operations staff (the

Correctional Manager attended one clinic meeting).[5] Differential rates of clinic attendance by the three RPC divisions may have resulted in differential rates of commitment to the program. Therefore, social desirability bias was unlikely to be consistent among the three CSC staff divisions.

Bias Due to Non-Consent

Several members of the FASD Team declined to be interviewed. It is possible that there were systematic differences in perception and experience of the team members who participated in the evaluation, compared to those who did not. Interviews are therefore not generalizable to all the FASD Team members.

Unique RPC Population

Similar to other Regional Treatment Centres (RTCs), RPC's inmate population consists of CSC inmates in the region who require psychiatric assessments/treatment and persons pending trials who need to be assessed for competency to stand trials. In addition, since RPC is located in the Prairie Region, RPC has a higher Indigenous inmate population compared to the other CSC facilities and RTCs. A data request from the RPC in April 2018 indicated that RPC had a higher proportion of Indigenous inmates (56% of inmate population was Indigenous at the RPC vs. 28% at other CSC facilities; OSI, 2018), compared to the overall CSC population. These results are therefore not generalizable to CSC facilities.

[5] Variable staff attendance rates at clinics should not necessarily be interpreted as different levels of commitment to the FASD program: due to scheduling conflicts, staff unfamiliar with the individual participant to be discussed in the clinic meeting or those who would not be responsible for implementing recommendations were no longer invited to the particular participant's clinic later on in the program. However, one would expect Team Members who attended more clinics to be more committed to the program as a consequence of their involvement. A comparison of the invited FASD Team vs. team members who attended and actively participated in the clinic would be a better measure of FASD Team members' commitment to the program.

3. Logic Model and Diagnosis Process

This chapter presents the FASD Program logic model and describes the diagnosis process, including the roles of the FASD Team (i.e., key staff and stakeholders). The logic model and diagnosis process was identified through triangulation of measures—a review of FASD diagnosis and screening publications, content analysis of program documents and interviews with the FASD Team (*n*=11). Inconsistencies between medical practice outlined in the literature and interview transcripts were resolved via follow-up correspondence with the FASD Coordinator and Neuropsychologist.

Program Logic Model

Program logic models are created to outline the intended inputs, activities, outputs, and outcomes of an initiative and enhances the stakeholders understanding of how a program is implemented (Newcomer et al., 2015). The FASD Program logic model is displayed in Table 3. The program logic model was developed based on interviews with the FASD Team and a review of program documents and included the methods and activities used for the FASD diagnosis and treatment recommendations.

Table 3. FASD Program Logic Model

Inputs	Activities	Outputs	Outcomes	
			Short Term	Long Term
• FASD Program Staff • RPC Consultants • External Stakeholders (FASD Network, Saskatoon Parole, Social services) • RPC Administration and Staff • RPC Facilities • CSC • Participant families • Community Programs and Services • OSCAR-EMR database • OMS Database • Screening tools • Canadian Diagnostic Guidelines • Evaluation Team	• Family interviews and parental confirmation • FASD screens • Psychological Assessments • Physical and psychiatric assessments • Clinic meetings • Discharge planning • Transition plans • Connecting clients with community agencies and services • Staff training and support	• Number of clients screened • Percentage of clients diagnosed • Number of parental confirmations received • Number of discharge plans developed • Proportion/number of services and agencies that participants are connected to address their need areas identified on treatment plans	• Increased community support for participants • Increased awareness about FASD among staff and stakeholders	• More effective interventions for the safe transition of clients to the community • Increased prosocial attitudes in participants • Decreased antisocial behaviours in participant • Decreased seriousness and frequency of disciplinary incidents of participant • Reduced recidivism

Overview of the Program Model

As noted in Chapter 2, the FASD Team was fluid and included:

1. **Internal RPC staff** assigned to the respective participant: social workers/clinical discharge planners, occupational therapists, psychologists, program officers, teachers, parole officers, correctional officer II, employment supervisors (e.g., food services, grounds maintenance, housekeeping supervisors), Elders and Aboriginal Liaison Officers (ALOs).[6]

2. **RPC consultants**: the Psychiatrist—who was also the Lead Clinician and head of the FASD Program—and the Neuropsychologist

3. **External stakeholders** involved in the program: Saskatoon Parole Officers and the FASD Network.

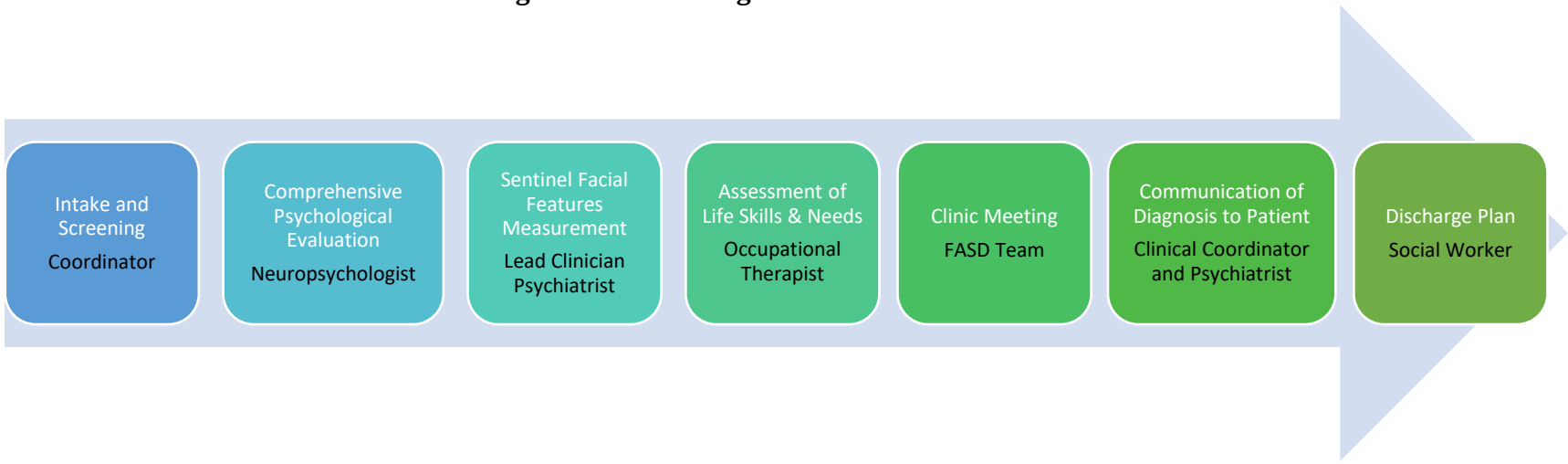
After consent was obtained by the FASD Coordinator (see Appendix E), each participant was screened for FASD (i.e., administrated the BSC-R, LHS, AYS, QFST, BSI and FST) and a multidisciplinary team comprised of a Psychiatrist, FASD Coordinator, and Neuropsychologist as 'core members' conducted the FASD assessment. The FASD diagnosis process followed the Canadian guidelines for FASD (Cook et al., 2016) and required: (1) a detailed medical history; (2) assessment of ten neurodevelopmental domains (i.e., neuroanatomy/neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation); and (3) measurement of the 3 SFF (i.e., Palpebral fissure lengths / eye openings, Philtrum rank score / the groove between the nose and upper lip, and Upper lip rank score / width of upper lip). Possible diagnosis outcomes are discussed further in the Clinic Meeting and Case Conference section of this chapter.

The medical history was obtained by the Coordinator and Psychiatrist. The Neuropsychologist used a battery of tests to assess impairment on nine of the ten neurodevelopmental domains functional domains—motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation—used to diagnose FASD (see Table 4 for the 10 domains and their measures). Assessing the tenth domain, neuroanatomy/neurophysiology, was the responsibility of the Psychiatrist. The Psychiatrist also contributed to the assessment of the: (1) adaptive function neurodevelopmental domain, along with the Neuropsychologist and Occupational Therapist (OT); and (2) affect regulation neurodevelopmental domain, along with the Neuropsychologist. Measurement of the three SFF was conducted by the Psychiatrist, occasionally with the assistance of the Coordinator. All the screen and FASD assessment data were then discussed by the FASD Team in a clinical meeting, whereby the team agreed on the diagnosis and made treatment recommendations. Required attendance at the clinical meeting included the core members, along with the social worker assigned to the assessed participant. Other RPC staff (e.g., occupational therapist,

[6] The majority of participants were involved with cultural activities; therefore, the participant's Elder or ALO was included in the multidisciplinary team.

psychologists, parole officers, participant supervisor if they were employed at the RPC, or teacher) who interacted with the assessed participant could also attend the clinic, if available. The diagnosis process is illustrated in Figure 2 and subsequently described in detail in the reminder of this section. The roles of the FASD Program Coordinator, Neuropsychologist, Psychiatrist and Occupational Therapist are discussed next.

Figure 2. FASD Diagnosis and Treatment Process



Note. The FASD Program Team member is listed in black ink, the process is listed in white ink. The Neuropsychologist and Psychiatrist saw participants based on their respective work schedules: some patients received the psychological battery first, while other participants had their facial features measured prior to the psychological battery. The original program model intended to exclude persons screened as low risk. After consultation with Correctional Service Canada Research Branch, the model was amended to diagnose and treat all participants scheduled for release to the community between July 1, 2018 and June 31, 2019. At the clinic, the FASD Team (psychiatrist/program director, coordinator, neuropsychologist, social worker, staff psychologists, community support providers) meet to discuss the psychological battery, medical history and Sentinel Facial Features (SFF) measurements to determine a diagnosis. Possible diagnoses included FASD with SFF, FASD without SFF, deferred, and not diagnosed. We merge FASD with SFF and FASD without SFF in subsequent analyses. We also flagged patients with three or more neurobehavioural domains as "Complex Needs" participants. The FASD Program Team also determined participants' treatment plan (within the institution, transition to community and discharge) at the clinic and communicated the results to the inmate. Patients received a copy of their diagnosis and treatment plan to take with them upon release from prison.

Intake, Screen and FASD Assessment

Coordinator

Consent. At the start of the FASD Program in 2018, RPC's interventions division provided a list of participants scheduled to be released within the next twelve months. The FASD Program Coordinator, hereafter, Coordinator, scheduled space to meet with each eligible participant for the initial consent process. Participants were prioritized in order of their release date. During the initial meeting, the FASD Program Coordinator invited patients to participate in the FASD Program and asked them to sign CSC's Consent to Participate In/Receive Health Services form (i.e., CSC/SCC 4000-18e [R-2016-08]) and RPC's Consent for Release of Information form (i.e., RPC 0218 [99/06]), which grants RPC permission to contact community agencies and family members to obtain information about the participant. See Appendix E for copies of both consent forms. No further attempts were made to recruit the eligible participant if they declined to participate in the program.

Medical Intake Interview. If consent was obtained, the Coordinator completed the Lakeland Centre for Fetal Alcohol Spectrum Disorder (Lakeland's FASD Program) "Applicant - New Client Information Form (NCIF)" with the participant. The NCIF is a seventeen page application form used by Lakeland's FASD Program to assist the multi-disciplinary team in making an FASD diagnosis, which was adapted for the FASD Program with permission by the Lakeland Centre.[7] The NCIF consisted of items on participant demographics, growth measures (e.g., height, weight, head circumference), physical health history (chronic illnesses, surgery, hospitalization, abuse), mental health history (e.g., medications, diagnoses and treatments), neurological health history (e.g., seizures, head injury, loss of consciousness), placements in foster homes, school history (e.g., highest grade completed, learning problems and behavioural problems), work experience, and developmental milestones (e.g., feeding, fine motor skills, language development, memory, hearing, vision, social skills, emotional stability, and activity level). Parental demographics, parental and sibling(s) medical history and maternal alcohol and substance use history are also included in the NCIF.

FASD Screens. After completing as much of the NCIF as possible with the participant in the initial meeting, the Coordinator administered the screening tools to the participant: the Brief Screen Checklist-Revised, Life History Screen, Asante Youth Screen, Quick Functional Screening Tool, Functional Screening Tool and the Brief Screen Index (items included in these screens are presented in Chapter 4, "FASD Screening" section). On average, the consent, medical intake interview process and screening lasted two hours. However, at times, institutional factors (e.g., lockdowns) or personal situations (e.g., disorders or conditions that required multiple meetings to complete the intake and screening process) extended the process to two sessions.

[7] This is a proprietary form and is not included as an Appendix in this report; for a copy of the NCIF, contact the Lakeland Centre.

Family Medical History, Foster Home Placements & Developmental Milestones.
Confirmation of prenatal alcohol exposure (PAE) was important, although not required for an FASD diagnosis according to the diagnostic guidelines (Cook et al., 2016). After the initial intake and screening, the Coordinator attempted to contact the participant's birth mother to obtain maternal medical history, alcohol consumption and substance use history, and information on the participant's placements in foster homes and developmental milestones. If unsuccessful (e.g., due to death or serious illness of the birth mother), the Coordinator contacted participant's family members. Maternal and family members' interviews were conducted over the telephone by the FASD Program Coordinator. The Coordinator was able to contact about two-thirds of participants' birth mothers or birth families. In addition, the Coordinator accessed the birth records for all participants. The birth records helped with identifying important information for some of the participants, including prenatal alcohol exposure, as well as the health status of the mother and baby before, during, and after delivery.

The Coordinator also attempted to obtain participants' education records. However, due to difficulties with accessing education records (i.e., educational records are often not available 10 years after graduation), the Coordinator instead obtained educational attainment and learning difficulties information from the RPC teachers. Finally, if the participant mentioned a prior FASD diagnosis in the intake or screening process, the Coordinator contacted the FASD Network in the respective province—RPC serves CSC inmates from the Prairie Region—to obtain confirmation of the previous diagnosis. (In the initial stages of the program, the Coordinator and Psychiatrist reviewed the screens and NCIF together as an inter-rater reliability measure to ensure the accuracy. This step was subsequently omitted after the Coordinator and Psychiatrist were satisfied the screens and NCIF were being completed correctly.) The Coordinator subsequently updated the NCIF with information obtained by the birth mother or family member, as well as the participant's electronic OSCAR-EMR records (see description below) and informed the participant about the content of any conversation with the birth mother or family members.

Medical File Review. Next, the Coordinator reviewed the participant's OMS (Offender Management System) and OSCAR (Open Source Clinical Application Resource) records to complete the NCIF and the medical history file review. OSCAR is an Electronic Medical Records (EMR) software program used by doctors and frontline health care professionals and includes clients' medical and mental health history data (e.g., testing [CT/MRI scans], diagnosis, and medications). OMS is an electronic administrative database used by the CSC, the Parole Board of Canada, and other criminal justice institutions and includes information on the criminal history of federal offenders, CSC assessments and institutional misconduct. Due to the stigma associated with FASD, when the Coordinator found inconsistencies in the information provided by the birth family and medical or educational records, the Coordinator deferred to the official medical or educational records. Finally, the Coordinator forwarded the medical history file to the contracted Neuropsychologist and Psychiatrist for review.

Neuropsychologist
The Neuropsychologist reviewed the participant files collected by the Coordinator, including the OSCAR-EMR health record, educational and employment record, and criminal records

(described above) prior to meeting with each participant. Upon meeting each participant, the Neuropsychologist first conducted an interview to verify the information contained in the participant file and then administered a battery of tests to assess nine of the ten neurobehavioural domains used to diagnose FASD—motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation—the Psychiatrist was responsible for assessing the tenth neurobehavioural domain used to diagnose FASD—neuroanatomy / neurophysiology. The Neuropsychologist's results were combined with: a) the Psychiatrist's for the affect regulation assessment; and b) the Psychiatrist and Occupational Therapist's results for the adaptive function assessment. The test battery used by the Neuropsychologist, Psychiatrist and OT are listed in Table 4.

The Neuropsychologist was also responsible for conducting a symptom screen, assessing participant perceptions, and identifying each participant's strengths and interests (to be used by the FASD Team to design the participant's treatment recommendations, including the discharge plan). The Neuropsychologist used the file review collected by the Coordinator, clinical interview and test battery results to determine in which domain(s) the participant experienced impairment, if any. According to the FASD diagnostic guidelines (Cook et al., 2016), impairment on three or more of the ten neurobehavioural domains (i.e., Central Nervous System [CNS] impairment) is required for an FASD diagnosis. Participants were scored as 'impaired' on any of the ten neurobehavioural domains if they scored 2 or more standard deviations below the population mean on the specific measure (Cook et al., 2016). Means and standard deviations on the domain items are typically stratified by age and, occasionally, also by socioeconomic status (i.e., the tests controlled for the effects of age and socioeconomic status). The Neuropsychologist noted difficulty in assessing two domains—adaptive function and psychopathology in the affect regulation assessment—and believed some inmate participants required a more detailed symptom evaluation with a de-emphasis on the personality assessment portion of the affect regulation assessment, while others required a more direct measure of adaptive function. The neuropsychologist used information obtained from the file review and clinical interview to interpret inconclusive data when measuring the neurobehavioural domains.[8]

The Neuropsychologist's portion of the FASD assessment typically lasted 3 hours—to minimize false positive rates due to participant fatigue when longer sessions are used. After the Neuropsychologist's portion of the FASD assessment was completed, the Coordinator next referred the participant to the Psychiatrist for their portion of the FASD assessment. The

[8] The Neuropsychologist was replaced by an internal RPC psychologist at the end of year 1. The Neuropsychologist mentioned a desire to add two tests—Symptoms Checklist 90 and Texas Functional Living Scales—as needed to measure adaptive function (i.e., independent living) for persons incarcerated for a prolonged period (email, 2020, January 20). The Neuropsychologist was also concerned about the validity of (1) the test battery for an institutional setting, specifically, how to quantitatively measure independent living skills, even with the addition of the Symptoms Checklist 90 and Texas Functional Living Scales and (2) using community norms to determine impairment. The Neuropsychologist conceded that the community standards used by the FASD Program was the most appropriate as one of the goals of the program was to prepare patients for community release and reintegration. This discrepancy between community norms and institutional adjustment norms caused some conflict with the FASD Team, as a few patients scored as impaired based on the community norms, but were relatively high-functioning in the prison (see Chapter 5 for discussion).

Neuropsychologist typically required one day on average to write the report. The Neuropsychologist then sent their report to the Coordinator—to be combined with the Psychiatrist's and OT's reports—to create the draft medical report to be discussed at the Clinic Meeting. After the Clinic Meeting, in which each participant's diagnosis outcome and discharge plan were determined, the Coordinator used the Neuropsychologist's report (as well as the Psychiatrist and OT[9] reports) to write the final medical report for each participant.[10]

Table 4. Central Nervous System (CNS) and Neurobehavioural Domain Measurement

Domain	Measures
Symptom Screen	Clinical Interview
	Repeatable Battery for the Assessment of Neuropsychological Status Updated (RBANS-U). Subtests: Figure Copy
Perception	Repeatable Battery for the Assessment of Neuropsychological Status Updated (RBANS-U). Subtests: Line Orientation
Neuroanatomy / neurophysiology[d]	Clinical Interview (history of seizures, brain injury and head size)[a]
Motor skills[e]	Repeatable Battery for the Assessment of Neuropsychological Status Updated (RBANS-U). Subtests: Figure Copy
	Grip Strength
	Grooved Pegboard Test
	Finger Tapper
Cognition and IQ	Wechsler Adult Intelligence Scale-IV (WAIS-IV)
Attention[f]	Neuropsychological Assessment Battery (NAB). Subtest: Attention Module
	Repeatable Battery for the Assessment of Neuropsychological Status Updated (RBANS-U). Subtests: Digit Span, Coding
Academic Achievement	Wide Range Achievement Test, Fifth Edition (WRAT-5)
Memory	Neuropsychological Assessment Battery (NAB). Subtest: Memory Module
	Repeatable Battery for the Assessment of Neuropsychological Status Updated (RBANS-U). Subtests: List Learning, Story Memory, Digit Span, List Recall, List Recognition, Story Recall, Figure Recall
Language[g]	Neuropsychological Assessment Battery (NAB). Language Module
	Repeatable Battery for the Assessment of Neuropsychological Status Updated (RBANS-U). Subtests: Picture Naming, Semantic Fluency
Executive Function[h]	Neuropsychological Assessment Battery (NAB). Subtest: Executive Function Module

[9] The OT's assessment was often conducted after the clinic meeting and was included in the participant's final medical report.

[10] Based on the discussion at the clinic meeting, the Neuropsychologist made final adjustments to one report: a prior brain injury was not revealed to the Neuropsychologist until the clinic meeting.

Domain	Measures
Adaptive Function	Neuropsychological Assessment Battery (NAB). Subtest: Daily Living Module
	Clinical Interview[b]
	Independent Living Scales (ILS)[c]
Affect Regulation[i]	SPECTRA: Indices of Psychopathology (SPECTRA)
	Personality Assessment Inventory (PAI)
	Clinical Interview[b]

[a] Conducted by the Psychiatrist, who was also the Lead Clinician and head of the FASD Program.
[b] Independent interviews were conducted by the Psychiatrist and Neuropsychologist; results were pooled and discussed at the clinic meeting when the FASD Team members present decided on the participant's diagnosis.
[c] Conducted by the Occupational Therapist.
[d] "Neuroanatomy / neurophysiology" was formerly termed "Brain structure" in the 2005 Canadian FASD guideline (Chudley et al., 2005) and redefined in the 2016 Canadian FASD guideline (Cook et al., 2016).
[e] "Motor skills" was formerly termed "Hard and soft neurological signs including sensory motor" in the 2005 Canadian FASD guide (Chudley et al., 2005).
[f] "Attention" was formerly termed "Attention deficit/hyperactivity" in the 2005 Canadian FASD guideline (Chudley et al., 2005) and redefined in the 2016 Canadian FASD guideline (Cook et al., 2016).
[g] "Language" was formerly termed "Communication" in the 2005 Canadian FASD guide (Chudley et al., 2005).
[h] "Executive Function" was expanded and clarified in the 2016 Canadian FASD guideline (Cook et al., 2016).
[i] "Affect Regulation" was added to the 2016 Canadian FASD guideline (Cook et al., 2016).

Psychiatrist

The Psychiatrist was responsible for leading the FASD Team and also for conducting the following components of the FASD assessment:

1. Confirmation of medical history and maternal medical history.

2. Assessing the tenth neurodevelopmental domain used to diagnose FASD, Neuroanatomy/Neurophysiology, which included any history of seizures and brain injuries; and growth measurements (i.e., cranial head measurements, height, weight).

3. Measurement of the three Sentinel Facial Features (SFF) used when making an FASD diagnosis (i.e., palpebral fissure lengths / eye openings, philtrum rank score / the groove between the nose and upper lip, and upper lip rank score / width of upper lip).

The Psychiatrist typically met with each participant after the Neuropsychologist completed their portion of the FASD assessment. The Psychiatrist verified information obtained by the Coordinator (i.e., information from the intake process and from telephone calls to the participant's family members and the OSCAR-EMR file review); conducted a psychiatric clinical interview to assess impairment in adaptive function and affect regulation; and conducted a biophysical examination to obtain growth and SFF measurements. The entire process lasted approximately 1 to 2.5 hours, and the majority of assessments were completed in one session.

While the growth and SFF measurements are crucial components of the FASD diagnosis process, the Psychiatrist also needed to rule out other (non-FASD) diagnoses during the clinical interview and assessment process. The Coordinator was typically present in the Psychiatrist's meetings with participants, to assist with the growth and SFF measurements. Similar to the intake and screen with the Coordinator, institutional factors such as lockdowns or emergencies, and the participant's ability to withstand the interview and medical examinations, occasionally extended the process into two sessions.

Consistent with the FASD diagnostic rules for ascertaining impairment on any of the ten neurodevelopmental domains, the Psychiatrist made a determination of individual participant's impairment on neuroanatomy/neurophysiology, adaptive function and affect regulation if the participant scored 2 or more standard deviations below the population mean on the specific measure (Cook et al., 2016). The Psychiatrist made a determination of "SFF" when there was simultaneous presentation of: palpebral fissure length at least two standard deviations (SD) below the population mean (for adult males, this was when the combined average for both eyes was equal to 2.55 cm or less; and for adult females, this was when the combined average for both eyes was equal to 2.53 cm or less); the philtrum rank score was 4 or 5 on the University of Washington Lip-Philtrum 5-point scale; and the upper lip rank score was 4 or 5 on the University of Washington Lip-Philtrum 5-point scale (Cook et al., 2016). The Psychiatrist typically took three days to review their clinical interview notes and measurements and write the final report.

The Psychiatrist then sent their report to the Coordinator—to be combined with the Neuropsychologist's and OT's reports—to create the draft medical report to be discussed at the Clinic Meeting. Possible diagnoses made by the interdisciplinary team at the Clinic Meeting were: (1) no diagnosis; (2) complex needs (CNS impairment; impairment on at least three of the ten neurodevelopmental domains); (3) FASD without SFF; and (4) FASD with SFF (these diagnoses are discussed further in the Clinic Meeting section of this chapter). While the Psychiatrist made the "SFF" determination, the "FASD" portion of the diagnosis was determined by the multidisciplinary team during the Clinic Meeting (Cook et al., 2016).

Occupational Therapist (OT)

The OT was responsible for conducting a portion of the adaptive function neurodevelopmental domain. To this end, The OT first conducted a file review of each participant's OSCAR-EMR medical files prior to scheduling the first meeting with the participant. The OT next interviewed each participant to determine the participant's task-based problem-solving skills and functional cognition, and administered the Independent Living Scales (ILS) to assessed participants' competence in activities of independent daily living. Based on the findings of clinical interview and ILS, the OT decided whether additional assessments were required.[11] The OT used each participant's performance in the ILS and any additional assessments to recommend the most appropriate living arrangements for the participant (e.g., transitional/halfway housing, assisted/supportive housing, semi-independent living or community residence) and additional

[11] The OT's interview and testing were typical of normal OT practice; if the participant had not been included in the FASD program, the OT would have conducted the assessment as part of their normal RPC duties.

supports the participant required to succeed in the community.[12] The entire assessment process typically required six hours and was completed in three sessions. Based on the OT's workload, the file review, assessment and report writing required three weeks, but would require as little as one week if the program had a dedicated OT team member. Also due to workload constraints, the OT was not always able to attend clinic meetings. For this reason, the clinic meeting (described below) typically occurred before the OT completed their portion of the assessment and the Coordinator inserted the OT's report and recommendations into the final medical report after the clinic meeting.

Clinic Meeting

Approximately one month after the Neuropsychologist and Psychiatrist completed their components of the FASD assessment, the Coordinator combined their reports—along with the medical intake information, family medical history and developmental milestones and medical file review—into a draft medical report. The Coordinator invited members of the FASD Team who worked directly with the participant (e.g., social workers, program officers, teachers,[13] parole officers, employed participants' RPC supervisor, Elder and/or Aboriginal Liaison Officer) to a clinic meeting.[14] If the participant was likely to be released to Saskatoon, an FASD Network outreach worker, the Canadian Mental Health Association (Saskatoon Branch) outreach worker, and a member of Saskatoon Parole Services would be invited.[15]

Twenty-five clinics were held in the initial year of the FASD Program. At the start of each clinic, the Coordinator presented the medical summary, which was followed by the Neuropsychologist's and Psychiatrist's summaries of their findings. The Neuropsychologist did not reside in Saskatchewan and typically joined the clinic meetings by teleconference. If the OT was able to complete their portion of the adaptive function neurodevelopmental domain assessment, the OT also presented their report at the clinic and provided examples of effective tools/techniques for institutional and community staff working with the participant. After all the

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[12] The OT and Neuropsychologist at times disagreed on what individual participant's required to succeed in the community. The OT preferred supported employment or purposeful activity in the long-run; the Neuropsychologist generally recommended financial assistance programs for participants diagnosed with CN or FASD, as they had dual issues of increased cognitive needs and a prior criminal record that would reduce their likelihood of obtaining stable employment (see Chapter 5 for discussion).

[13] Teachers were added several months into the FASD Program after the FASD Team noticed many participants experienced difficulty obtaining a high-school level education. An RPC teacher was first present at the April 9, 2019 clinic meeting.

[14] Initially, all members of the FASD Team were invited to Clinic Meetings to build buy-in for the program and avoid excluding RPC staff who were interested in contributing to the program. However, this was difficult to schedule due to the members' work commitments, and staff unfamiliar with the individual participant to be discussed in the meeting. As result, those who would not be responsible for implementing recommendations were no longer invited to the particular participant's clinic.

[15] If the participant was being released to another Prairie province, the Saskatoon FASD Network provided contacts for the respective release destination FASD Network (e.g., for the Mustard Seed in Calgary) to the Social Worker responsible for creating the participant's discharge plan.

medical and assessment information was presented, the team members in attendance made a diagnosis (see Table 5) and formulated recommendations specific to the participant's needs.

Table 5. FASD Diagnostic Criteria: 2016 Canadian Diagnostic Guidelines

Diagnosis	Sentinel Facial Features	Neurobehavioural Domains	Prenatal Alcohol Exposure (PAE)
No Diagnosis (ND)	No presentation of the 3 sentinel facial features: - Palpebral fissure length ≤ 2 SD below mean; - Philtrum rank 4 or 5; - Upper lip rank 4 or 5.	No Evidence of CNS impairment (i.e., impairment in < 3 neurobehavioural domains)	PAE, Unconfirmed or No PAE
Complex Needs (CN)	No presentation of sentinel facial features (as defined above)	Evidence of CNS impairment (i.e., impairment in ≥ 3 neurobehavioural domains)	Unconfirmed or No PAE
FASD without SFF	No presentation of sentinel facial features (as defined above)	Evidence of CNS impairment (as defined above)	Confirmed PAE
FASD with SFF	Simultaneous presentation of all 3 sentinel facial features (as defined above)	Evidence of CNS impairment (as defined above)	Confirmed or unconfirmed PAE

Note. The Sentinel Facial Features (SFF) were coded as present when all the following occurred: (1) palpebral fissure length ≤ 2 SD below the mean; (2) philtrum rank was 4 or 5; and (3) upper lip rank was 4 or 5 (Cook et al., 2016). Neurobehavioural domains include: neuroanatomy / neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation. CNS Impairment was defined as scores 2 or more standard deviation below the mean for the respective diagnostic instrument for at least three neurobehavioural domains (see Table 4 for list of diagnostic instruments). ND can occur when the three SFF are present, provided there was no CNS impairment (Cook et al., 2016, p. 5).

The number of FASD Team members that attended clinic meetings ranged from 5 to 13, with the Coordinator, Psychiatrist and Social Worker assigned to the participant always in attendance. There were a few instances where the Neuropsychologist was unable to attend or call into the clinic, and an RPC staff psychologist read the Neuropsychologist's report. Clinic meetings lasted half a day during the initial stages of the project, but were reduced to a couple hours as the FASD Team became more experienced. The clinic meetings served two purposes:

1. To discuss the FASD assessment information obtained by the Coordinator, Neuropsychologist and Psychiatrist—and possibly from the OT, if the participant's assessment was completed prior to the clinic—and make a diagnosis according to the

Canadian Diagnostic Guidelines for FASD (Cook et al., 2016). Possible diagnoses are summarized in Table 5.

2. To formulate treatment recommendations for the participant (see Appendix G), which included:
    a. Institutional recommendations,
    b. Transitional recommendations
    c. Community recommendations

All recommendations were strengths based. Institutional and transition recommendations were intended to be implemented within RPC—or another CSC facility, if the participant was transferred—prior to the participant's release to the community. However, due to the brief period between assessment and community release, institutional and transitional treatment recommendations were not implemented. Community recommendations were integrated into discharge plans designed by the Social Worker responsible for the particular participant (see "Discharge Plan" section below). Due to the difficulties in accessing CSC data, no information was obtained verifying which community recommendations were actually implemented in discharge plans. An analysis of treatment recommendations is presented in Chapter 4.

Based on the discussion at the clinic, final adjustments were made to the participant's medical report. The medical report was typically finalized within one week after the meeting, and copies were provided to the participant (see "Communication of Diagnosis to Participant" section below), and the participant's RPC Social Worker. A copy of the report was stored in the FASD Program electronic files and uploaded to the participant's OSCAR-EMR file. The Coordinator also forwarded a copy of the medical report to the Community Mental Health Specialist in the release location, who provided the necessary information to the participant's community parole officer (PO).[16] As CSC staff, community POs can access offenders' criminal records, but they are not able to access health records. However, the Mental Health Specialist would be able to access the records and convey the necessary information to the PO.

Communication of Diagnosis to Participant

After the clinic meeting, the Coordinator, Psychiatrist, and potentially the Neuropsychologist if they were at the RPC, debriefed the participant. The Coordinator also provided the participant with a copy of the final report, including the treatment recommendations, within a week after the clinic meeting. Participants are encouraged to share their report with their community doctors and support staff upon their release.

Discharge Plan

One of the most crucial parts of the FASD Program is providing clients with a discharge plan tailored to the participants' strengths and needs. The OT conducted the main assessments for

[16] Each CSC parole office has a community mental health specialist, employment coordinator and Indigenous Liaison Officer.

discharge plans and discharge plans were discussed in the clinic meetings. Many of the recommendations discussed in the clinic meeting were common items included in a typical discharge plan. The social worker next created and implemented the discharge plan, after notification from the Parole Board about the date and location of the inmate's release was received. Ideally, the social worker required notification three to six months prior to the participant's release to create a comprehensive discharge plan and arrange the necessary referrals to community support agencies.

The discharge plans developed for the clients were goal-oriented and strengths-based: each participant worked with their social worker to create three short-term and three long-term goals; the social worker then identified suitable community organizations that would provide the services participants' needed to achieve their goals. Recommendations were individualized to the participant's cultural background, unique strengths and deficits. For example, referrals were provided to community agencies that provide substance abuse, addictions and mental health support as needed, and the social worker attempted to schedule the first appointment for the participant. Recommendations also included referrals for positive mentorship, education/training and employment agencies. In addition, referrals were provided for spiritual or religious institutions. If possible, the social worker generally selected community agencies that provided wrap-around or holistic services (e.g., mental health, primary health, employment advice/training, cultural supports and family supports).

Ideally, the social worker obtained a Photo ID, Social Insurance Number, and provincial health card for each participant, or ensured the participant had these documents in hand. Participants released to another province were provided with a Saskatchewan government 90 days temporary health card to provide interim coverage until their new province of residence provided health coverage. Participants were also provided with transportation from RPC to their destination, if needed. Housing was a crucial component of the discharge plan: the social worker ensured participants were either connected with their family or arranged community housing for the participant. Participants with disabilities, including FASD, were referred to social assistance programs such as Saskatchewan Assured Income for Disability (SAID) or Transitional Employment Allowance (TEA), and trustees/guardians were arranged to help participants manage their finances upon community release.

For participants with CN or FASD being released to Saskatoon, the Coordinator contacted the FASD Network's outreach worker to refer the participant for services. For participants being released to another province, the Coordinator contacted the respective FASD Network or service provider prior to the participant's release to arrange a referral. Confirmation of PAE and an FASD diagnosis was crucial to securing financial or disability aid, as the social worker could only refer diagnosed participants for some forms of financial aid and participants with CN had more limited access to financial aid. Social workers at RPC typically have contacts at multiple community organizations in different provinces. In a few cases, the Parole Board of Canada changed the release location a few days prior to the participant's release date, and the social worker used their pre-existing contacts in the new release location to arrange basic supports for the participants (e.g., identification, health coverage, and housing), and subsequently followed-up with community service providers after the participant was released to secure other supports/

services (e.g., employment agencies, mental health/addictions, mentorship, continuing education, cultural supports). Finally, the social worker communicated the discharge plan to staff at community organizations (e.g., health, mental health, family physicians) and the community PO.

FASD Network

The FASD Network is a non-profit community-based, provincial organization in Saskatchewan which aims to enhance the lives of individuals and families living with FASD through support, services, training, and events. As an external stakeholder, the FASD Network was considered part of the FASD Team and invited to clinic meetings. The FASD Network does not require an FASD diagnosis and will provide services even in the absence of a confirmed diagnosis, as long as there is evidence of neurodevelopmental domain impairment. Participants with a CN or FASD diagnosis scheduled for release in Saskatoon were referred to the FASD Network. The FASD Network attempted to meet at least once with referred participants prior to their release from RPC, with the intent to provide case management services (e.g., access and coordination housing, mental health care, health care, food, employment services and family support) upon the participant's release to the community. These services were not directly provided by the FASD Network. Instead, FASD Network's partner agencies provided a suite of programs (e.g., housing is provided by the John Howard Society and Elizabeth Fry Society; food bank and free clothing; the Fine Option Program allows justice-involved people to work to pay off fines rather than serving time in jail). These are listed in Table 6. If the participant was unable to personally access or afford transportation, the FASD Network staff also drove participants to mental health, addictions support or other appointments. For participants with FASD being released to another province, if the social worker was unable to contact the respective FASD Network office via their personal contacts, the FASD Network used their own contacts to help the social worker secure a referral for the participant.

Table 6. The Agencies and Programs that the FASD Network Connects Clients

Partner Agencies	Programs
• Cognitive Disability Strategy (CDS) • Saskatchewan Assistance Program (SAP) • Saskatchewan Assured Income for Disability (SAID) • Saskatchewan Transitional Employment Allowance (TEA) • Central Urban Métis Federation (CUMFI) • North Saskatchewan Independent Living Centre (NSILC) • Radius Community Centre for Education and Employment Training • Saskatoon Downtown Youth Centre (EGADZ)	• Fine Option Program (Alternatives to Paying a Provincial Fine) • John Howard Society • Elizabeth Fry Society of Saskatchewan • Child and Family Services • Saskatoon Tribal Council • Employment • Food bank and Free clothing • Healthy Mother Healthy Baby • Advocacy • Ombudsman services in the human rights office • Public Complaints Commission • Victim services

• 601 Family Support • Lighthouse Supported Living • Saskatoon Indian & Metis Friendship Centre (STC) • Sexual Health Centre • Out Saskatoon	• Health services • Student Wellness Initiative Toward Community Health (SWITCH) • Family Court • Rentalsman Court

Changes to the Original Program Model

The pilot project generally followed the original diagnosis model which was based on the Canadian Diagnostic Guidelines for FASD (Cook et al., 2016). However, a few adjustments were made to the program design due to some time restrictions, ethical concerns, and participants' needs as observed by the FASD Team.[17]

- **Non-implementation of Institutional and Transitional Recommendations**. Due to the brief period between the FASD assessment and participant release, institutional and transitional recommendations were not implemented.

- **Access to Treatment Recommendations.** Initially, RPC patients scheduled for community release between July 1, 2018 and June 30, 2019 were to be screened for FASD (i.e., administered the BSC-R, LHS, AYS, QFST, BSI and FST), and persons who were screened as high-risk for FASD by one or more screen would be assessed for FASD, that is, receive the intake interview and assessed by the Neuropsychologist, Psychiatrist and OT. National Headquarters (NHQ) requested the Clinical Lead/Psychiatrist amend the proposed program model to ensure all patients scheduled for release between July 1, 2018 and June 30, 2019 received treatment recommendations targeted to their individual cognitive needs and strengths.

- **Inclusion of Teachers on the FASD Team.** During the program, the FASD Team became aware of the difficulties participants' encountered in completing a high-school level education. Teachers were subsequently invited to join the FASD Team and attend clinic meetings, which did not occur until the 9th month of the program.

[17] In the second year of the program, the Neuropsychologist's assessments were conducted by an RPC staff psychologist untrained in FASD assessment and diagnosis. FASD training has not been provided to the new psychologist as of approximately one year after the staffing change.

4. Sample: Diagnosis, Screening and Treatment

This chapter presents the quantitative results of the FASD Evaluation and outlines the FASD Program treatment recommendations. Chapter 4 includes the sample characteristics, the prevalence of FASD in the RPC (EG 2a) and accuracy of the five screens—BSC-R, LHS, AYS, QFST and FST—used by the FASD Program with a decision rule (EG 2b). No accuracy rates are provided for the BSI, as the tool is not far enough in its development to have determined a decision rule; that is, no rule has been determined to identify or flag persons who are high-risk for FASD and should be referred for a complete FASD assessment.

Additionally, we present an overview of the treatment plans—institutional, transitional, and community—recommended for participants assessed by the FASD Program (EG 3). Due to the high needs typical of RPC participants, the FASD Team developed treatment recommendations for all assessed participants, irrespective of FASD diagnosis, with the intent to meet each individual patient's needs. However, institutional plans were not implemented due to the shorter than expected duration between assessment and release dates.

The FASD Program followed the Canadian FASD guidelines (Cook et al., 2016, pp. 3 and 5) for FASD diagnosis. Comparisons were further made for the four possible diagnoses outcomes used by the FASD Program:

1. No Diagnosis (ND) requires evidence of impairment or inconclusive evidence of impairment on fewer than 3 neurodevelopmental domains.
   a) 3 Sentinel Facial Features (SFF)[18] may be present; however, there must be no or inconclusive evidence of impairment on less than three neurodevelopmental domains.[19]

   b) Prenatal alcohol exposure (PAE) may be confirmed, unconfirmed or absent.

2. Complex Needs (CN) requires **both** of the following 2 conditions:
   a) Conclusive evidence of Central Nervous System (CNS) impairment (i.e., impairment on three or more neurodevelopmental domains); and

   b) Unconfirmed or no evidence of PAE.

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[18] The Sentinel Facial Features (SFF) are coded as present when (1) palpebral fissure length is at least 2 standard deviation below the mean according to Canadian population means and standard deviation; (2) philtrum rank is 4 or 5 on the University of Washington Lip-Philtrum 5-point scale; and (3) upper lip rank is 4 or 5 on the University of Washington Lip-Philtrum 5-point scale (See Chapter 2; Cook et al., 2016).

[19] Impairment occurs when a participant scores at least 2 SD below the population mean for any of the neurodevelopmental domains used when diagnosing FASD—neuroanatomy/neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation (See Chapter 3 for details on measuring neurodevelopmental domains). The standards for the neurodevelopmental domain assessments used to diagnose FASD were based on community means and standard deviations.

3. FASD without SFF requires **both** of the following 2 conditions:
   a) Conclusive evidence of CNS impairment; and

   b) Confirmation of PAE.

4. FASD with SFF requires **all** of the following 3 conditions:
   a) 3 SFF must be present;

   b) Confirmed or unconfirmed/unknown PAE; and

   c) Conclusive evidence of CNS impairment.

Due to the small sample size, FASD with SFF and FASD without SFF were combined into a single FASD diagnosis category for much of this report. Chi-square (χ^2) statistics are presented for categorical demographic characteristics, diagnosis profile and to compare participants' characteristics across different diagnosis outcome groups. An Analysis of Variance (ANOVA) F statistic and Bonferroni post-hoc test were used to compare continuous variables for the diagnosis outcome groups. When the equal variance assumption of the *F* statistics was violated, the more robust Welch *F* statistic and Games-Howell post-hoc test are presented instead, unless otherwise noted in the results tables. The *F* statistic and Welch *F* statistic are used to determine if at least one group mean is different from the others, post-hoc tests identify which group means are significantly different from the others (Field, 2009). Independent samples t-tests were used to determine differences in mean age by gender (Field, 2009).

As mentioned in Chapter 2, all χ^2 statistics presented in this chapter violated the minimum cell count assumptions and should be interpreted with caution. It should be noted that the statistics presented are based on non-random and small samples for assessed (n = 25) and screened participants (n = 22 participants completed the BSC-R, LHS, AYS, QFST and FST; n = 20 participants completed the BSI). Therefore, results describe the assessed sample and screened participants subsample, and are not generalizable to the RPC population or the wider CSC incarcerated population.

Sample Characteristics

The FASD Program assessed 25 participants in year 1 (July 1, 2018 through June 30, 2019). Slightly over three-quarters were male, and 80% were Indigenous. The average age of assessed participants was 32.80 years. Female participants (M = 27.17, SD = 2.86) were significantly younger than male (M = 34.58, SD = 9.42) participants (t(22.991) = -3.017, p < .01; see Table 8).[20] Indigenous (M = 33.45, SD = 9.46) and multi-racial participants (M = 33.33, SD = 5.86) were almost 8 years older than white participants (M = 25.50, SD = 2.12). This difference was not statistically significant (F(2, 22) = 0.719, p > .05; see Table 7).

[20] The second line of the t-test, equal variances not assumed, is presented.

Out of the 25 assessed participants, 22 completed the FASD screens with a decision rule—Brief Screen Checklist-Revised (BSC-R), Life History Screen (LHS), Asante Youth Screen (AYS), Quick Functional Screening Tool (QFST) and Functional Screening Tool (FST).[21] The female participant screened subsample (M = 26.50, SD = 3.42) was about 8 years younger than the male participant screened subsample (M = 34.44, SD = 9.68), but this was not significantly different ($t(20) = -1.593$, $p > .05$; see Table 8). The demographic distribution by ethnicity was similar for the assessed and screened participants (see Table 7).

Table 7. Sample Characteristics by Ethnicity

	White n =2	Indigenous n =20	Multi-Racial n =3	Total N =25	Test Statistic	df	p-value
Diagnosed Patients							
Male	50%	80%	67%	76%	0.932	2	0.628
Age	25.50 (2.12)	33.45 (9.46)	33.33 (5.86)	32.80 (8.87)	0.719	2, 22	0.499
Diagnosis							
No Diagnosis (ND)	50%	5%	33%	12%	5.472	4	0.242
Complex Needs (CN)	0%	45%	33%	40%			
FASD	50%	50%	33%	48%			
	White n =2	Indigenous n =17	Multi-Racial n =3	Total N =22			
Screened Patients							
Male	50%	88%	67%	82%	2.295	2	0.317
Age	25.50 (2.12)	33.82 (10.11)	33.33 (5.86)	33.00 (9.35)	0.691	2, 19	0.513
Diagnosis							
No Diagnosis (ND)	50%	6%	33%	14%	4.676	4	0.322
Complex Needs (CN)	0%	47%	33%	41%			
FASD	50%	47%	33%	46%			

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Note. Chi-square statistic, degree of freedom and p-values are reported for categorical variables; the F statistic, between group degree of freedom, within group degree of freedom, and p-value are reported for continuous variables. The Sentinel Facial Features (SFF) are coded as present when palpebral fissure length ≤ 2 SD below the mean, philtrum rank is 4 or 5 and upper lip rank is 4 or 5. Neurobehavioral domains include: Neuroanatomy / neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation. Complex Needs=impairment of ≥ 3 domains; FASD without SFF=impairment ≥ 3 domains and PAE; FASD with SFF=impairment of ≥ 3 domains, presence of 3 SFF and (confirmed or unknown) PAE. **FASD** group includes **FASD with SFF** and **FASD without SFF**. The **Complex Needs** category includes one patient who received a deferred FASD diagnosis. Count and percent are presented for categorical variables; mean and standard deviation are presented for continuous variables.

FASD Prevalence by Ethnicity

The diagnosis distribution by ethnicity was similar for the assessed (χ^2 (4) = 5.472, $p > .05$) and screened (χ^2 (4) = 4.676, $p > .05$) participants (see Table 7):

1. Approximately half of Indigenous participants and a third of multi-racial participants were diagnosed with FASD for both the assessed sample and screened participant subsample. One of the two white participants was also diagnosed with FASD; however,

[21] These screens were described in Chapter 2; detailed analyses are presented later in this chapter.

since only 2 white participants were assessed by the FASD Program, no conclusions should be drawn about the prevalence of FASD among white CSC patients.

2. Almost half of assessed (45%) and screened (47%) Indigenous participants were diagnosed with CN.

3. One third of assessed and screened multi-racial participants were diagnosed with CN.

FASD Prevalence by Gender

When FASD rates for assessed participants (n = 25) were analyzed by gender, female participants had a higher FASD rate than males (67% vs. 42%); however, this difference was not significant (χ^2 (2) = 1.608, p > .05; See Table 9). Similar non-significant gender differences in FASD diagnosis were found for the screened participant subsample (n = 22). Three-quarters of the female and about 39% of the male screened participant subsample was diagnosed with FASD (χ^2 (2) = 1.908, p > .05).

Table 8. Diagnosis Outcomes by Gender

	Females n =6	Males n =19	Total N =25	Test Statistic	df	p-value
Diagnosed Patients						
Age	27.17 (2.86)	34.58 (9.42)	32.80 (8.87)	-3.017**	22.991	0.006
Diagnosis						
No Diagnosis (ND)	0%	16%	12%	1.608	2	0.447
Complex Needs (CN)	33%	42%	40%			
FASD	67%	42%	48%			
	Females n =4	Males n =18	Total N =22	Test Statistic	df	p-value
Screened Patients						
Age	26.50 (3.42)	34.44 (9.68)	33.00 (9.35)	-1.593	20	0.127
Diagnosis						
No Diagnosis (ND)	0%	17%	14%	1.908	2	0.385
Complex Needs (CN)	25%	44%	41%			
FASD	75%	39%	46%			

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Note. T-tests are presented for mean differences in age by gender for daignosed and screened participants. For diagnosed participants, the second line of the t-test, equal variances not assumed, are presented; chi-square statistics are presented for significant differnces in diagnosis outcomes by participant gender.

When gender comparisons are made for CN vs. FASD diagnosis, an interesting, though non-significant, pattern emerged. Male participants were equally likely to be diagnosed with FASD (42%) and CN (42%), while female participants are much more likely to be diagnosed with

FASD (67%), compared to CN (33%). This finding was consistent, though non-significant, for the assessed sample and screened participant subsample (see Table 8). Finally, rates of FASD among male and female participants in the FASD Program were much higher than previous studies involving new male admissions to CSC (10% FASD rate and 45% moderate or severe CNS impairment; MacPerson, Chudley, & Grant, 2011), female inmates (17% probable FASD and 22% CN; Forrester et al., 2015). Due to the non-random sampling used in this evaluation and the high-needs nature of participants referred to the RPC, the high rates of FASD and CN should be compared to other Regional Treatment Centres, and not interpreted as representative of the CSC inmate population.

Table 9. All Diagnosed Participants: Subgroup Distribution of PAE, SFF and Neurodevelopmental Domain

	ND *n* =3	CN *n* =10	FASD without SFF *n* =9	FASD with SFF *n* =3	Total *N* =25	Test Statistic	df	p-value
Prenatal Alcohol Exposure (PAE)	0%	0%	100%	67%	44%	25.960***	6	0.000
Sentinel Facial Features (SFF)								
Mean Palpebral fissure lengths (cm): both eyes	2.62 (0.33)	2.77 (0.22)	2.61 (0.19)	2.40 (0.18)	2.65 (0.24)	2.373†	3, 21	0.099
Feature present (S.D. ≥ -2)	67%	30%	44%	100%	48%	9.699	12	0.642
Mean Palpebral fissure lengths (cm): left eye	2.57 (0.38)	2.76 (0.22)	2.61 (0.21)	2.37 (0.15)	2.64 (0.25)	2.433†	3, 21	0.093
Feature present (S.D. ≥ -2)	67%	30%	56%	100%	52%	8.425	9	0.492
Mean Palpebral fissure lengths (cm): right eye	2.67 (0.29)	2.77 (0.24)	2.60 (0.17)	2.43 (0.21)	2.66 (0.23)	2.208	3, 21	0.117
Feature present (S.D. ≥ -2)	67%	20%	33%	67%	36%	12.546	12	0.403
Mean Philtrum rank (1-5)[a, b]	3.00 (.00)	3.11 (1.27)	2.78 (0.97)	4.00 (.00)	3.08 (1.02)	1.105	3, 20	0.370
Feature present (score=4 or 5)[a]	0%	44%	22%	100%	38%	13.926	12	0.305
Mean Upper lip rank (1-5)[a]	2.00 (1.00)	2.78 (1.30)	2.11 (1.05)	4.00 (.00)	2.58 (1.21)	2.561†	3, 20	0.084
Feature present (score=4 or 5)[a]	0%	22%	11%	100%	25%	16.940	12	0.152
Mean SFF (Max=3)[c]	0.67 (0.58)	0.80 (1.03)	0.89 (0.60)	3.00 (.00)	1.08 (1.04)	6.749**	3, 21	0.002
3 Features present	0%	0%	0%	100%	12%	29.977**	12	0.003
Neurodevelopmental Domains								
Impaired Neuroanatomy/neurophysiology	0%	0%	11%	0%	4%	1.852	3	0.604
Impaired Motor skills	0%	40%	44%	67%	40%	2.963	3	0.397
Impaired Cognition	67%	100%	89%	100%	92%	3.865	3	0.276
IQ ≤ 70	67%	100%	89%	100%	92%	9.420	6	0.151
Mean IQ	75.00 (11.27)	60.50 (6.31)	62.33 (10.25)	59.00 (9.64)	62.72 (9.54)	2.326	3, 21	0.104
Impaired Attention	0%	50%	67%	100%	56%	6.737†	3	0.081
Impaired Academic Ability	0%	70%	56%	100%	60%	6.991†	3	0.072
Impaired Memory	33%	80%	89%	100%	80%	5.278	3	0.153
Impaired Language/Communication	0%	40%	56%	100%	48%	6.481†	3	0.090
Impaired Executive Function	0%	40%	56%	67%	44%	3.535	3	0.316
Impaired Adaptive Function	0%	0%	11%	33%	8%	3.865	3	0.276
Impaired Affect Regulation	33%	10%	11%	0%	12%	1.747	3	0.627
Mean Neurodevelopmental domains (Max=10)[a]	1.33 (0.58)	4.30 (0.95)	4.89 (1.05)	6.67 (1.16)	4.44 (1.66)	15.789***	3, 21	0.000

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Notes continue on the next page

Note. Chi-square statistic, degree of freedom and *p*-values are reported for categorical variables; the *F* statistic, between group degree of freedom, within group degree of freedom, and *p*-value are reported for continuous variables. Due to the small sample size and small size of the ND group, test results should be interpreted with caution. The minimum cell count assumption was violated for all chi-square tests. The *F*-statistic and Bonferroni post-hoc were used to describe mean differences between the groups when the equal variance assumption was not violated (Levene's *p*-value > .05). Percent 'impaired' for ND, CN, FASD with SFF and FASD without SFF and Total Sample are reported for binary variables. For continuous scores, the mean and standard deviation is reported. The Sentinel Facial Features (SFF) are coded as present when palpebral fissure length ≥ 2 SD below the mean, philtrum rank is 4 or 5 and upper lip rank is 4 or 5. Neurobehavioural domains include: Neuroanatomy / neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation. CN =impairment of ≥ 3 domains; FASD without SFF=impairment ≥ 3 domains and PAE; FASD with SFF=impairment of ≥ 3 domains, presence of 3 SFF and (confirmed or unknown) PAE.

[a] Philtrum smoothness score and upper lip rank was inconclusive for one inmate participant with Complex Needs.

[b] The ANOVA was unable to produce the robust test, the Welch *F* statistic, because at least one group has 0 variance. The Welch *F* is typically reported instead of the *F*-statistic when the equal variances assumption for ANOVA is violated, that is, the Levene's test *p*-value is < .05. For this analysis, the less robust *F*-statistic is reported. According to the Games-Howell post-hoc test, the mean Philtrum rank was significantly higher for the FASD with SFF group, compared to the FASD without SFF group.

[c] The Sentinel Facial Features (SFF) are coded as present when palpebral fissure length ≥ 2 SD below the mean, philtrum rank is 4 or 5 and upper lip rank is 4 or 5. For adult males, palpebral fissure length ≥ 2 SD below the mean=2.55 cm or less for the average of both eyes; for adult females palpebral fissure length ≥ 2 SD below the mean=2.53 cm or less for the average of both eyes. The ANOVA was unable to produce the robust test, the Welch F statistic, because at least one group has 0 variance. The Welch F is typically reported instead of the F-statistic when the equal variances assumption for ANOVA is violated, that is, the Levene's test *p*-value is < .05. For this analysis, the less robust F-statistic is reported. According to the Games-Howell post-hoc test, FASD with SFF group had significantly more SFF, compared to all other groups. The Games-Howell is an appropriate post-hoc test to determine mean differences between specific sub-groups when the ANOVA test equal variance assumption is violated.

[d] Equal variances assumption of the ANOVA test was not violated. According to the Bonferroni post-hoc test, the ND group is impaired on significantly fewer neurobehavioural domains compared to all other groups; the FASD with SFF group is impaired on significantly more domains compared to the Complex Needs group, but was statistically indistinguishable from the FASD without SFF group. Accordingly, FASD with SFF and FASD without SFF groups are merged into a single FASD group subsequent analysis. The Bonferroni post-hoc is the appropriate test to determine differences in group means when the equal variances assumption was not violated, that is, the Levene's test *p*-value is ≥ .05.

Distribution of PAE, SFF and Neurodevelopmental Domains

The section covers the distribution of the diagnostic domains—PAE, SFF and neurobehavioural domains—for the assessed participants (n = 25) and the screened participant subsample (n = 22). Differences between the assessed and screened sub-sample will be highlighted, to contextualize the limitations of the sub-sample generalizability. Table 9 illustrates the distribution of PAE, SFF and neurobehavioural domains for all assessed participants (n = 25), broken-down by the four diagnosis outcomes: ND (n = 3), CN (n = 10), FASD without SFF (n = 9) and FASD with SFF (n = 3).

Overall, PAE was confirmed by the mother or a relative in almost half of the assessed sample (45%). Given that PAE is a requirement for the FASD without SFF diagnosis, PAE was present for 100% of the FASD without SFF cases, but only for 67% of the FASD with SFF cases. PAE was significantly different for FASD without SFF (100%), compared to the ND (0%) and CN (0%) groups (χ^2 (6) = 25.960, $p < .001$). PAE was significantly different for FASD with SFF (67%), compared to the ND (0%) and CN (0%) groups.

The presence of the three sentinel facial features—mean palpebral fissure lengths for both eyes at least 2 standard deviations below the mean, philtrum rank scores of 4 or 5, and upper lip rank scores of 4 or 5—are required for an FASD with SFF diagnosis. Consequently, the three sentinel facial features were present in 100% of the FASD with SFF cases, and absent (0%) for the other diagnosis groups (ND, CN and FASD without SFF). Average SFF (F(3, 21) = 6.749, $p < .01$) and the presence of the 3 SFF (χ^2 (12) = 29.977, $p < .01$) were both able to distinguish between the FASD with SFF group and the other diagnosis groups.

Neurodevelopmental domain impairment was significantly higher for the FASD with SFF (M = 6.67, SD = 1.16) group, compared to the ND (M = 1.33, SD = 0.58) and CN (M = 4.30, SD = 0.95) groups (F(3, 21) = 15.789, $p < .001$). However, according to the Bonferroni post-hoc test, average neurodevelopmental domain impairment was not significantly different for the FASD with SFF and FASD without SFF (M = 4.89, SD = 1.05) groups (see Table 10, footnote d). Also of note, participants assessed by the FASD Program, on average, were impaired on more than 4 neurodevelopmental domains (M = 4.44, SD = 1.66).

Screened Cases: PAE, SFF and Neurobehavioural Domain Impairment

Although risk screens are not part of the diagnosis progress, one of the goals of the FASD Program was to determine the relative accuracy rates of several FASD screens. Three Indigenous participants assessed by the FASD Program did not complete the dementia screens used by the program with a decision rule (i.e., BSC-R, LHS, AYS, QFST, and FST). Of these participants with incomplete FASD screens, one each was diagnosed with CN, FASD without SFF and FASD with SFF.

The screen subsample (n = 22) had a similar pattern of PAE, SFF and neurobehavioural domain impairment to the assessed cases (n = 25).

1. PAE for the two FASD groups (both 100%) was significantly higher than the ND (0%) and CN (0%) groups (χ^2 (6) = 23.467, $p < .01$).

2. When sentinel facial features were counted individually, average SFF for the FASD with SFF group was significantly higher than the other diagnosis groups ($F(3, 18) = 4.726$, $p < .05$).

3. According to the Bonferroni post-hoc test, the FASD with SFF ($M = 7.00$, $SD = 1.41$) and FASD without SFF ($M = 5.00$, SD = 1.07) groups were diagnosed as impaired on significantly more neurobehavioural domains than the CN ($M = 4.22$, $SD = .97$) and ND ($M = 1.33$, $SD = .58$) groups ($F(3, 18) = 14.774$, $p < .001$).

However, both the screened sample and assessed participants differed on several individual SFF and neurobehavioural domain items at the .1 level. For the assessed cases, rates of impaired academic (χ^2 (6) = 6.991, $p < .1$) and language/communication ability (χ^2 (6) = 6.481, $p < .1$) were significantly higher for the FASD with SFF group compared to the other diagnosis groups. This pattern did not occur for the screened sample. For PAE, SFF and neurobehavioural domain impairment distributions, see Table 9 for assessed participants and Table 10 for the screened participant subsample.[22]

[22] For the assessed cases, mean palpebral fissure lengths was significantly smaller for the FASD with SFF group compared to the other diagnosis groups; however, this information is of little use as we did not disaggregate the male and female cases. The mean and standard deviation palpebral fissure lengths differ for males and females; they also differ for American and Canadian populations.

Table 10. Screened Sample: Subgroup Distribution of PAE, SFF and Neurodevelopmental Domains

	ND *n* =3	CN *n* =9	FASD without SFF *n* =8	FASD with SFF *n* =2	Total *N* =22	Test Statistic	df	p-value
Prenatal Alcohol Exposure (PAE)	0%	0%	100%	100%	46%	23.467**	6	0.001
Sentinel Facial Features (SFF)								
Mean Palpebral fissure lengths (cm): both eyes	2.62 (.33)	2.75 (.23)	2.61 (.20)	2.38 (.25)	2.65 (.24)	1.588	3, 18	0.227
Feature present (S.D. ≥ -2)	67%	33%	50%	100%	50%	6.606	12	0.882
Mean Palpebral fissure lengths (cm): left eye	2.57 (.38)	2.76 (.23)	2.61 (.23)	2.35 (.21)	2.64 (.26)	1.660	3, 18	0.211
Feature present (S.D. ≥ -2)	67%	33%	63%	100%	55%	5.067	6	0.535
Mean Palpebral fissure lengths (cm): right eye	2.67 (.29)	2.74 (.24)	2.60 (.18)	2.40 (.28)	2.65 (.23)	1.493	3, 18	0.250
Feature present (S.D. ≥ -2)	67%	22%	38%	50%	36%	8.910	12	0.711
Mean Philtrum rank (1-5)[a]	3.00 (.00)	3.00 (1.31)	2.63 (.92)	4.00 (.00)	2.95 (1.02)	0.976	3, 17	0.427
Feature present (score=4 or 5)[a]	0%	38%	13%	100%	29%	13.358	12	0.344
Mean Upper lip rank (1-5)[a]	2.00 (.00)	2.75 (1.39)	1.88 (.84)	4.00 (.00)	2.43 (1.21)	2.439	3, 17	0.100
Feature present (score=4 or 5)[a]	0%	25%	0%	100%	19%	16.858	12	0.155
Mean SFF (Max=3)[b]	0.67 (.58)	0.78 (1.09)	0.75 (.46)	3.00 (.00)	0.95 (1.00)	4.726*	3, 18	0.013
3 Features present	0%	0%	0%	100%	9%	30.311**	12	0.003
Neurodevelopmental Domains								
Impaired Neuroanatomy/neurophysiology	0%	0%	13%	0%	5%	1.833	3	0.608
Impaired Motor skills	0%	33%	38%	50%	32%	1.833	3	0.608
Impaired Cognition	67%	100%	88%	100%	91%	3.346	3	0.341
IQ ≤ 70	75.00 (11.27)	61.11 (6.37)	64.38 (8.78)	55.50 (10.61)	63.68 (9.29)	2.834†	3, 18	0.067
Mean IQ	0.67	100%	88%	100%	91%	8.388	6	0.211
Impaired Attention	0%	44%	75%	100%	55%	6.987†	3	0.072
Impaired Academic Ability	0%	67%	50%	100%	55%	5.867	3	0.118
Impaired Memory	33%	78%	88%	100%	77%	4.364	3	0.225
Impaired Language/Communication	0%	44%	63%	100%	50%	5.611	3	0.132
Impaired Executive Function	0%	44%	63%	100%	50%	5.611	3	0.132
Impaired Adaptive Function	0%	0%	13%	50%	9%	5.362	3	0.147
Impaired Affect Regulation	33%	11%	13%	0%	14%	1.362	3	0.715
Mean Neurodevelopmental domains (Max=10)[c]	1.33 (.58)	4.22 (.97)	5.00 (1.07)	7.00 (1.41)	4.36 (1.73)	14.774***	3, 18	0.000

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Notes continue on the next page

Note. Chi-square statistic, degree of freedom and p-values are reported for categorical variables; the F statistic, between group degree of freedom, within group degree of freedom, and p-value are reported for continuous variables. Due to the small sample size and small size of the ND group, test results should be interpreted with caution. The minimum cell count assumption was violated for all chi-square tests. The F statistic and Bonferroni post-hoc were used to describe mean differences between the groups when the equal variance assumption was not violated (Levene's p-value > .05). Percent 'impaired' for ND, CN, FASD with SFF and FASD without SFF and Total Sample are reported for binary variables. For continuous scores, the mean and standard deviation are reported. The Sentinel Facial Features (SFF) are coded as present when palpebral fissure length ≥ 2 SD below the mean, philtrum rank is 4 or 5 and upper lip rank is 4 or 5. Neurobehavioural domains include: Neuroanatomy / neurophysiology, motor skills, cognition, attention, academic ability, memory, language/communication, executive function, adaptive function and affect regulation. CN=impairment of ≥ 3 domains; FASD without SFF=impairment ≥ 3 domains and PAE; FASD with SFF=impairment of ≥ 3 domains, presence of 3 SFF and (confirmed or unknown) PAE.

[a] Philtrum smoothness score and upper lip rank was inconclusive for one inmate participant with Complex Needs.

[b] Sentinel Facial Features (SFF) are coded as present when palpebral fissure length ≥ 2 SD below the mean, philtrum rank is 4 or 5 and upper lip rank is 4 or 5. For adult males, palpebral fissure length ≥ 2 SD below the mean=2.55 cm or less for the average of both eyes; for adult females palpebral fissure length ≥ 2 SD below the mean=2.53 cm or less for the average of both eyes. The ANOVA was unable to produce the robust test, the Welch F statistic, because at least one group has 0 variance. The Welch F is typically reported instead of the F statistic when the equal variances assumption for ANOVA is violated, that is, the Levene's test p-value is < .05. For this analysis, the less robust F statistic is reported. According to the Games-Howell post-hoc test, FASD with SFF group had significantly more SFF, compared to all other groups. The Games-Howell is an appropriate post-hoc test to determine mean differences between specific sub-groups when the ANOVA test equal variance assumption is violated, that is, the Levene's test p-value is < .05.

[c] The equal variances assumption of the ANOVA test was not violated. According to the Bonferroni post-hoc test, the ND group is impaired on significantly fewer neurobehavioural domains compared to all other groups; the FASD with SFF group is impaired on significantly more domains compared to the CN group, but was statistically indistinguishable from the FASD without SFF group. Accordingly, FASD with SFF and FASD without SFF groups are merged into a single FASD group subsequent analysis.

FASD Screening

As noted earlier in this chapter, several screens were administered to the FASD Program participants. Screens or risk tools are short instruments that can be administered to identify persons at high risk for a condition and are used instead of widespread testing. A validated and accurate tool will have a high rate of accuracy in identifying persons who require further medical testing for a condition and, subsequently, be more cost-effective than 100% population testing (Trevethan, 2017). There are several ways of accessing the accuracy of screen tools (also referred to as risk tools). Typically, receiver operating characteristic (ROC) curves are used to determine a tool's accuracy rate: the area under the curve (AUC) ranges from 0-1. AUC values between 0.90-1 are excellent, values between 0.80-0.89 are good, values between 0.70-0.79 are fair, values between 0.60-0.69 are poor, and values between 0.50-0.59 are failed tools (El Khouli et al., 2009). Due to the small sample size, overall prediction was computed manually using the formula: (true positives + true negatives) / total cases * 100. This is the simplified computational formula for AUC (number of correctly classified cases / number of cases), with the exception that AUCs are not converted to a percentage (see Metz, 1978, p. 284). Other accuracy statistics used to assess the FASD screens included:

1. **Positive predictive value (PPV)**, the probability that a person who tests positive actually has the condition of interest (Trevethan, 2017).

2. **Negative predictive value (NPV)**, probability that a person who tests negative does not have the condition of interest (Trevethan, 2017).

3. **Sensitivity (Se)**, how good the test is at correctly identifying participants with condition of interest (Trevethan, 2017). It is calculated as the number of correctly classified positive cases (true positives) / the number of positive cases in the sample (Metz, 1978).

4. **Specificity (Sp)**, how good the test is at correctly identifying the absence of a condition (Trevethan, 2017). It is calculated as the number of correctly classified negative cases (true negatives) / the number of negative cases in the sample (Metz, 1978). See Chapter 2 for computation formulas for the correct prediction rate, PPV, NPV, Se and Sp.

The Brief Screen Checklist-Revised (BSC-R), Life History Screen (LHS), Asante Youth Screen (AYS), Quick Functional Screening Tool (QFST), and Functional Screening Tool (FST) have not been validated, but tool development is far enough along to have determined decision rules or cut-off scores to flag at-risk persons for a complete FASD assessment. This section presents accuracy statistics for these tools, along with detailed analysis of each screen for ND (n = 3), CN (n = 9) and FASD (n = 10) diagnosis outcome groups. Due the small sample size (n = 22) and because this evaluation presents primarily statistics on the screened subsample, these results should be interpreted as a pilot test and excluded from future validation studies undertaken by CSC's FASD Program.

The final FASD screen used by the FASD Program, the Brief Screen Index (BSI), is early in its development and has no decision rule. It was hoped that Year 1 of the FASD Program would

have assessed sufficient cases to determine a preliminary decision rule; however, there were insufficient cases to meet this goal as only 20 participants completed the BSI. Detailed distribution per item is provided for the BSI ND (*n* = 3), CN (*n* = 8) and FASD (*n* = 9) diagnosis outcome groups. However, due to the absence of a decision rule, no accuracy statistics are provided.

Accuracy Summary

Table 11 presents the accuracy rates for the screens in predicting FASD and predicting both FASD and CN; no accuracy rate is presented for the BSI. The overall correct prediction rate, PPV, NPV, Se and Sp for the BSC-R, LHS, AYS, QFST, and FST are presented in Table 11 (see Appendix F for the computation worksheet). The top portion of Table 11 provides accuracy statistics for FASD vs. no FASD (i.e., ND and CN); the lower portion of the table provides accuracy statistics for FASD and CN vs. ND. The reference ("gold") standard used in this analysis is the current Canadian FASD guidelines (Cook et al., 2016), which is the diagnosis protocol used by the FASD Program. For context, it must be noted that the BSC-R, LHS, AYS, QFST, and FST were created before the current Canadian FASD guidelines were formulated. The BSC-R, QFST and FST used the 2005 Canadian FASD guide (Chudley et al., 2005) as their reference standard; and the LHS used the American FASD diagnosis standard in 2013 (see Hoyme et al., 2005).

The AYS (86%) and QFST (77%) had the highest overall FASD accuracy rate. Both the AYS and QFST correctly identified all 10 participants with FASD (Se = 100%). The probability that participants flagged as high-risk were diagnosed with FASD was lower for both tools, as several participants flagged as high-risk by the AYS and QFST were not diagnosed with FASD. The AYS incorrectly flagged 3 persons as high risk for FASD (PPV = 77%), while the QFST incorrectly flagged 5 persons as high risk for FASD (PPV = 67%). Although all cases flagged as low-risk by the AYS and QFST were not diagnosed with FASD (NPV = 100%), the AYS and QFST incorrectly flagged several ND participants for a complete FASD diagnosis (Sp = 75% and 58%, respectively).

The AYS and QFST were less successful, overall, in predicting either FASD or CN; however, both tools had the highest overall accuracy rate (73%), when compared to the BSC-R (27%), LHS (68%), and FST (68%). The FASD Program diagnosed 19 participants with FASD (*n* = 10) or CN (*n* = 9). The LHS, QFST and FST (Se = 79%, 74% and 74%, respectively) were most successful at correctly identifying participants with FASD or CN; however, all tools misclassified some participants with the condition as low-risk. The AYS was the strongest tool for correctly identifying the ND participants (Sp = 100%); however, 6 participants with FASD or CN were incorrectly flagged as low-risk (NPV = 33%). While it is costly to administer a complete FASD assessment, CSC may prefer to err on the side of over-inclusion in the high-risk category, thus selecting a screen with the highest PPV (AYS) and/or sensitivity (LHS), rather than focusing on the overall correct prediction rate.

Table 11. Accuracy Rates of the FASD Screens (N=22)

	Brief Screen Checklist-R	Life History Screen	Asante Youth Screen	Quick Functional Screening Tool	Functional Screening Tool	Brief Screen Index
FASD						
Overall Correct Prediction Rate	68%	55%	86%	77%	55%	
Positive Predictive Value (PPV)	80%	50%	77%	67%	50%	
Negative Predictive Value (NPV)	65%	75%	100%	100%	67%	
Sensitivity	40%	90%	100%	100%	80%	
Specificity	92%	25%	75%	58%	33%	
FASD and Complex needs						
Overall Correct Prediction Rate	27%	68%	73%	73%	68%	
Positive Predictive Value (PPV)	80%	83%	100%	93%	88%	
Negative Predictive Value (NPV)	12%	0%	33%	29%	17%	
Sensitivity	21%	79%	68%	74%	74%	
Specificity	67%	0%	100%	67%	33%	

Note. Accuracy rates were computed as follows: overall accuracy = (total high risk cases with a positive diagnosis + total low risk cases with a negative diagnosis) / total cases; PPV = total flagged as high risk by tool with positive diagnosis / total flagged as high-risk by tool; NPV = total flagged as low-risk by tool with a negative diagnosis / total flagged as low-risk by tool; sensitivity = total flagged as high risk by tool with positive diagnosis / total positive diagnosis cases; and specificity = total flagged as low-risk by tool with a negative diagnosis / total negative diagnosis cases. No decision rule is available for the Brief Screen Index and accuracy rates are presented.

Brief Screen Checklist – Revised (BSC-R)

The FASD Program administered the original BSC to participants. However, due to the improved performance of the BSC-R compared to the BSC,[23] the BSC data was recoded in SPSS to create the BSC-R (MacPherson, Chudley & Grant, 2011, pp 75-80). The BSC-R diagnosis outcome group comparison is illustrated in Table 12. The BSC-R, a 36-item scale, is sub-divided into Behavioural Indicators (26), Historical Indicators (4) and Maternal Indicators (6). The BSC-R's criteria for a complete FASD assessment includes:

1. A score of 10 or higher on Behavioural Indicators, AND
2. A score of 2 or more on Historical Indicators, AND
3. Responses of "at least twice a week" for frequency of mother's drinking OR "four or more drinks per occasion" for the number of mother's intake on a typical drinking occasion.

Criterion one, 10+ score on Behavioural Indicators, was significantly different for the diagnosis groups (χ^2 (2) = 6.259, $p < .05$). However, while the FASD group was more likely to score 10 or higher on Behavioural Indicators compared to the CN group (44%), the FASD (90%) and ND groups (100%) were indistinguishable. Several individual Behavioural Indicators were significantly different for the diagnosis outcome groups, but not in the expected manner. The FASD group was more likely to experience mood swings (ND = 100% vs. CN = 33% vs. FASD = 80%), have problems with money (ND = 100% vs. CN = 22% vs. FASD = 60%), be agitated

[23] AUC=.88; Se=86%; Sp=73%; PPV=27%; and NPV=98% (MacPherson et al., 2011).

(ND = 100% vs. CN = 22% vs. FASD = 70%), have trouble completing tasks (ND = 100% vs. CN = 22% vs. FASD = 70%) and poor attention spans (ND = 100% vs. CN = 22% vs. FASD = 70%) compared to the CN group. Contrary to expected, the FASD group was *less* likely to experience these indicators compared to the ND group. Indeed, all ND group members were moderate to high risk on the BSC-R's Behavioural Indicators.

A similar pattern emerged with the BSC-R's Historical Indicators: the FASD group was more likely to score 2+ (moderate to high risk) compared to the CN group (ND = 100% vs. CN = 44% vs. FASD = 70%); however, the FASD group was *less* likely to score as moderate to high risk on Historical Indicators compared to the ND group (χ^2 (2) = 11.898, $p < .01$). The third criteria, responses of "at least twice a week" for frequency of mother's drinking (χ^2 (8) = 14.195, $p < .1$), or "four or more drinks per occasion" for the number of the mother's intake on a typical drinking occasion (χ^2 (6) = 10.409, $p > .05$), were both non-significant. Finally, the decision rule encompassing the 3 criteria, was non-significant (χ^2 (2) = 4.538, $p > .05$).

AUC or tool accuracy typically declines after pilot testing. As expected, tool accuracy declined from AUC = .86 (a good tool) to an overall accuracy of 68%, which is considered a poor predictor. Se (40% vs. 85%) and NPV (65% vs. 97%) also declined, when compared to the original MacPherson et al. (2011) study. However, PPV (80% vs. 41%) and Sp (92% vs. 85%) improved with the FASD Program data compared to the MacPherson et al. (2011) study. In other words, when the BSC-R flagged a participant as high-risk, they had an 80% chance of having FASD, and 92% of participants flagged as low-risk did not have FASD; however, many persons with FASD were flagged as low-risk by the test, which reduced the overall tool accuracy, Se and NPV (see Table 11 and Appendix F for details).

If CSC intends for the screen to identify the persons who require a complete FASD assessment or to identify high-risk for CN and FASD, the BSC-R is a poor tool (Se = 40% and 21%, respectively). In terms of overall accuracy in predicting FASD (68%) or FASD and CN (27%), the BSC-R also performed poorly. This result was consistent with the inability of the decision rule to distinguish between the diagnosis outcome groups. Due to the small sample size and differences in the reference standard used by the MacPherson et al. (2011) study and FASD Program, reconfiguring the BSC-R decision rule using the recent Canadian FASD guidelines (Cook et al., 2016) and a larger sample may be prudent.

Table 12. Brief Screen Checklist-Revised Item Distribution

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Behavioural items							
Acts impulsively	100%	44%	70%	64%	3.322	2	0.190
Has trouble following directions	67%	44%	70%	59%	1.362	2	0.506
Is restless	100%	56%	50%	59%	2.465	2	0.292
Has a problem with spelling (excluded)	0%	22%	70%	41%	6.878*	2	0.032
Shows poor judgment	0%	56%	60%	50%	3.511	2	0.173
Is easily distracted	100%	33%	70%	59%	5.039†	2	0.080
Has temper tantrums	33%	44%	50%	46%	0.265	2	0.876
Has strong mood swings	100%	33%	80%	64%	6.443*	2	0.040
Is hyperactive	100%	44%	60%	59%	2.879	2	0.237
Has a problem budgeting or handling money (excluded)	100%	22%	60%	50%	6.178*	2	0.046
Seems unaware of the consequences of his/her actions	100%	56%	40%	55%	3.357	2	0.187
Has a problem with arithmetic	33%	56%	80%	64%	2.602	2	0.272
Interrupts a lot during conversation	100%	33%	30%	41%	5.039†	2	0.080
Is agitated	100%	22%	70%	55%	7.256*	2	0.027
Is very forgetful of everyday things	67%	33%	70%	55%	2.774	2	0.250
Talks a lot but says little	33%	44%	40%	41%	0.121	2	0.941
Has a poor memory	0%	33%	50%	36%	2.554	2	0.279
Has a problem with reading	33%	0%	40%	23%	4.538	2	0.103
Is easily victimized	67%	56%	50%	55%	0.265	2	0.876
Has trouble completing tasks	100%	22%	70%	55%	7.256*	2	0.027
Has a poor attention span	100%	22%	70%	55%	7.256*	2	0.027
Has few friends	33%	44%	40%	41%	0.121	2	0.941
Is easily manipulated	67%	33%	40%	41%	1.040	2	0.594
Is disorganized	100%	11%	30%	32%	8.223*	2	0.016
Has trouble staying on topic	100%	22%	30%	36%	6.203*	2	0.045
Has poor social skills	33%	44%	10%	27%	2.898	2	0.235
Mean Behavioural Items Subscore (Max=26)	**17.67 (1.53)**	**9.33 (5.94)**	**14.00 (5.23)**	**12.59 (5.88)**	**3.436†**	**2, 19**	**0.053**
Low risk (0-9)	0%	56%	10%	27%	6.259*	2	0.044
Moderate to high risk (10-26)	100%	44%	90%	73%			

Table 12. Brief Screen Checklist-Revised Item Distribution (Continued)

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Historical items							
Adopted	0%	11%	50%	27%	4.914†	2	0.086
Problems with school from an early age	100%	56%	90%	77%	4.222	2	0.121
Ever received treatment for a mental health problem[a]	100%	78%	60%	73%			
1-2 times	100%	78%	50%	68%	3.748	4	0.441
3 +	0%	0%	10%	5%			
Mean Historical Items Subscore (Max=6)[b]	**3.67 (.58)**	**1.44 (.88)**	**2.90 (1.79)**	**2.41 (1.56)**	**11.898****	**2, 8.63**	**0.003**
Low risk (0-1)	0%	56%	30%	36%	3.322	2	0.190
Moderate to high risk (2-6)	100%	44%	70%	64%			
Maternal Alcohol & Drug Use History							
Maternal used alcohol when patient was young	67%	33%	100%	68%	10.756*	4	0.029
Frequency of mother's drinking							
≤ 1x per month	0%	0%	20%	9%	14.195†	8	0.077
2-4x per month	0%	11%	0%	5%			
≥ 2x per week	33%	0%	60%	32%			
Number of mother's intake on a typical drinking occasion[c]							
1-3 drinks	0%	0%	10%	5%	10.409	6	0.108
4+ drinks	0%	0%	40%	18%			
Maternal alcohol use during pregnancy	0%	0%	90%	41%	18.635**	4	0.001
Maternal Tobacco use during pregnancy	33%	44%	80%	59%	4.818	4	0.307
Maternal Prescription use during pregnancy (w/ prescription)	0%	0%	20%	9%	7.812†	4	0.099
Maternal Prescription use during pregnancy (w/o prescription)							
Maternal alcohol use during pregnancy Illicit (cocaine)	33%	0%	10%	9%	6.498	4	0.165
Referral recommended	**33%**	**0%**	**40%**	**23%**	**4.538**	**2**	**0.103**

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

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Note. Percent 'yes' for No Diagnosis (ND), Complex Needs (CN), FASD (with or without SFF) and Total Screened inmates is reported for binary variables. For continuous scores, the mean and standard deviation are reported. The category CN includes participants with 3 or more neurobehavioural deficits. The CN category includes one participant who received a deferred FASD diagnosis. Chi-square statistic, degree of freedom and *p*-values are reported for categorical variables; the minimum cell count assumption was violated for all chi-square tests and results should be interpreted with caution. For continuous variables, the *F* statistic, degree of freedom and *p*-values are reported, and the Bonferroni post-hoc test is used to determine differences in group means when the equal variances assumption was not violated; the Welch *F* and Games-Howell post-hoc tests are reported when the equal variances assumption is violated. Due to the small sample size and small size of the ND group, all test results should be interpreted with caution.

[a] Significance test provided for the detailed breakdown for this variable, as is appropriate for a categorical variable. “Any mental health problems” provided as a summary measure and was not scored in the tool.

[b] The equal variances assumption of the ANOVA test was violated. The Welch *F* is reported instead of the ANOVA *F* statistic. According to the Games-Howell post-hoc test, the ND group had a significantly higher mean Historical Items subscore, compared to the FASD group. The Games-Howell is an appropriate post-hoc test to determine mean differences between specific sub-groups when the ANOVA test equal variance assumption is violated, that is, the Levene's test *p*-value is $< .05$.

[c] One standard drink was defined as: 12 oz. (341 ml, standard bottle) of regular beer; 5 oz. (142 ml, regular size wine glass) of table wine; 3 oz. (85 ml) of fortified wine (sherry, port, vermouth); 1.5 oz. (43 ml, single shot) of spirits (whiskey, rum, gin).

Life History Screen (LHS)

The LHS item comparison for ND, CN and FASD diagnosis outcome groups is illustrated in Table 13. The LHS was divided into Childhood History (2), Maternal Alcohol Use (3), Education (4), Criminal History (2), Substance Use (2), Employment and Income (2), Living Situation (2), Mental Health (3) and Day-to-Day Behaviours (11) domains. The LHS flags persons with the following for a complete FASD assessment:

1. Red flags on all 3 Key Life History Domains—Childhood History, Maternal Alcohol Use and Day-to-Day Behaviours, OR

2. Red flags on 2 Key Life History Domains AND at least 2 red flags on Other Life History Domains—Education, Criminal History, Substance Use, Employment and Income, Living Situation, and Mental Health.

The Key Life History Domain flag was successfully able to distinguish between the 3 diagnosis outcome groups ($F(2, 19) = 4.939$, $p < .05$). According to the Bonferroni post-hoc test, mean Key Life History Domains were significantly higher for the FASD ($M = 2.70$, $SD = .67$) vs. the CN group ($M = 1.67$, $SD = .87$). However, the FASD and ND groups ($M = 2.67$, $SD = .58$) had similar average Key Life History Domains. This pattern was driven by a similar pattern of group differences in individual Maternal Alcohol Use and Day-to-Day Behaviour items. The CN group was less likely to report their mother's alcohol use as causing problems (ND = 100% vs. CN = 56% vs. FASD = 100%) and mother's alcohol use when they were young (ND = 100% vs. CN = 56% vs. FASD = 100%) than the FASD group, while these rates were identical for the FASD and ND groups.

This issue also occurred with Day-to-Day Behaviours, another of the Key Life History Domains: when significant differences occurred, the CN group were less likely to experience the event compared to both the FASD and ND groups; and the FASD and ND group rates were similar. The CN group was less likely to report difficulty paying attention (ND = 100% vs. CN = 22% vs. FASD = 80%) and being on time (ND = 100% vs. CN = 22% vs. FASD = 60%), compared to the FASD and ND groups.

As noted previously, the LHS refers a participant with all 3 Key Life History Domain flags, or 2 Key Life History Domain flags and at least 2 red flags on Other Life History Domains. Significant differences were found in the mean scores on Key Life History Domains ($F(2, 19) = 4.939$, $p < .05$), but no significant differences were found in the mean scores on Other Life History Domain.[24] Finally, no significant differences were found in the decision rule (ND = 100% vs. CN = 67% vs. FASD = 90%) between the diagnosis groups ($\chi 2\ (2) = 2.506$, $p > .05$). Importantly, the significant difference found in the Key Life History Domains was not useful, as the ND and FASD groups performed similarly.

[24] The ANOVA *F* violated the equal variances assumption when testing for mean differences in Other Life History Domains. The more robust Welch *F* statistic could not be produced, but a Games-Howell post-hoc test found no significant differences between the diagnosis groups. ANOVA *F* is reported in Table 12, but this estimator is biased.

Table 13. Life History Screen Item Distribution

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Key Life History Domains							
Childhood History							
Raised by non-biologic/birth parents	67%	78%	90%	82%	1.012	2	0.603
More than two living situations while growing up	67%	67%	80%	73%	0.489	2	0.783
Childhood History Red Flag (> 2 living situations)	67%	67%	80%	73%	0.489	2	0.783
Maternal Alcohol Use							
Mother's alcohol use caused problems flag	100%	56%	100%	82%	7.062*	2	0.029
Yes	67%	11%	90%	55%	13.383*	4	0.010
Unknown	33%	44%	10%	27%			
Mother drank when patient was young flag	100%	56%	100%	82%	7.062*	2	0.029
Yes	100%	11%	90%	59%	15.013**	4	0.005
Unknown	0%	44%	10%	23%			
Mother drank alcohol while pregnant with patient flag	67%	78%	100%	86%	3.131	2	0.209
Yes	33%	0%	90%	46%	16.078**	4	0.003
Unknown	33%	67%	10%	36%			
Maternal Alcohol Use Red Flag (at least two red flags)	100%	56%	100%	82%	7.062*	2	0.029
Day-to-Day Behaviors							
Frequent difficulties concentrating and paying attention	100%	22%	80%	59%	8.946*	2	0.011
Frequent difficulties understanding what adults are telling them	0%	22%	50%	32%	3.306	2	0.191
Frequent difficulties remembering things	33%	44%	90%	64%	5.627†	2	0.060
Frequent difficulties following rules and instructions	67%	22%	50%	41%	2.465	2	0.292
Frequent difficulties getting along with others	67%	33%	40%	41%	1.040	2	0.594
Frequent difficulties being on time	100%	22%	60%	50%	6.178*	2	0.046
Frequent difficulties with money management	67%	44%	50%	50%	0.444	2	0.801
Frequently regretting behaviour	100%	78%	90%	86%	1.149	2	0.563
Frequently over-react to minor problems	67%	44%	80%	64%	2.602	2	0.272
Frequently forgets or misses appointments	67%	44%	80%	64%	2.602	2	0.272
Frequently surprised when they get in trouble	100%	44%	60%	59%	2.879	2	0.237
Day-to-Day Behaviors Red Flag (≥ 5 red flag)	**1.00**	**0.44**	**0.90**	**0.73**	**6.259***	**2**	**0.044**
Mean Key Life History Domains (Max=3)[a]	2.67 (.58)	1.67 (.87)	2.70 (.67)	2.27 (.88)	4.939*	2, 19	0.019

Table 13. Life History Screen Item Distribution (Continued)

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Other Life History Domains							
Education							
≤ 10th grade education	100%	78%	90%	86%	1.149	2	0.563
Ever in "special ed"	67%	56%	80%	68%	1.308	2	0.520
Problems with Mathematics in school	67%	33%	60%	50%	1.733	2	0.420
Education Red Flag (≥ 1 red flag)	100%	78%	100%	91%	3.178	2	0.204
Criminal History							
Ever in trouble with the law	100%	100%	100%	100%			
Ever arrested	100%	100%	100%	100%			
Criminal History Red Flag (≥ 1 red flag)	100%	100%	100%	100%			
Substance Use							
Started using alcohol or drugs before age 12	67%	22%	40%	36%	2.025	2	0.363
Patient started using alcohol or drugs after problems in school began	33%	11%	40%	27%	2.057	2	0.357
Substance Use Red Flag (≥ 1 red flag)	67%	22%	60%	46%	3.357	2	0.187
Employment and Income							
Longest time patient was employed in the same job flag	100%	89%	100%	96%	1.513	2	0.469
< 1 year	100%	56%	70%	68%	3.072	4	0.546
Never employed	0%	33%	30%	27%			
Ever received Supplemental security income	100%	78%	60%	73%	2.057	2	0.357
Employment and Income Red Flag (≥ 1 red flag)	100%	100%	100%	100%			
Living Situation							
Never lived on their own as adult flag	33%	44%	70%	55%	1.878	2	0.391
Lived alone < 1 year as adult flag	67%	56%	100%	77%	5.550†	2	0.062
Living Situation Red Flag (≥ 1 red flag)	67%	56%	100%	77%	5.550†	2	0.062
Mental Health							
> 1 mental health difficulties or disorders	67%	44%	70%	59%	1.362	2	0.506
Ever tried to commit suicide	100%	89%	80%	86%	0.866	2	0.648
Ever receive childhood mental health services	67%	44%	60%	55%	0.668	2	0.716
Mental Health Red Flag (≥ 2 red flag)	0.67	0.67	0.80	0.73	0.489	2	0.783
Mean Other Life History Domains (Max=6)[b]	**5.00 (.00)**	**4.11 (1.36)**	**5.40 (.70)**	**4.82 (1.14)**	**3.932***	**2, 19**	**0.037**
Eligible for treatment modification	**100%**	**67%**	**90%**	**82%**	**2.506**	**2**	**0.286**

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Notes continue on the next page

Note. Percent 'Red Flags' for No Diagnosis (ND), Complex Needs (CN), FASD (with or without SFF) and Total Screened inmates is reported for binary variables, according to the Life History Screen's inclusion of unknown in its red flags; 'yes' and 'unknown' percent is provided in italics for reference. For continuous scores, the mean and standard deviation is reported. The category CN includes participants with 3 or more neurobehavioural deficits. The CN category includes one participant who received a deferred FASD diagnosis. Post-hoc tests determined mean "Life History" items were significantly higher for the FASD group, compared to the CN group. Mean "Other Life History" items were also significantly higher for the FASD group compared to the CN group. Chi-square statistic, degree of freedom and *p*-values are reported for categorical variables; the minimum cell count assumption was violated for all chi-square tests and results should be interpreted with caution. For continuous variables, the *F* statistic, degree of freedom and *p*-values are reported, and the Bonferroni post-hoc is used to determine differences in group means when the equal variances assumption was not violated; the Welch *F* and Games-Howell post-hoc tests are reported when the equal variances assumption is violated. Due to the small sample size and small size of the ND group, all test results should be interpreted with caution.

[a] The equal variances assumption of the ANOVA test was not violated. The Bonferroni post-hoc test determined that the mean Life History Domains were significantly higher for the FASD group compared to the Complex Needs group.

[b] The ANOVA was unable to produce the robust test, the Welch *F* statistic, because at least one group has 0 variance. The Welch *F* is typically reported instead of the *F*-statistic when the equal variances assumption for ANOVA is violated, that is, the Levene's test *p*-value is < .05. For this analysis, the less robust ANOVA *F* statistic is reported. The Games-Howell post-hoc test found no differences in mean Other Life History Domains between the groups.

This was reflected in the accuracy statistics for the LHS (see Table 11), which had an overall accuracy rate of 55% for FASD—slightly better than a coin toss and is considered a failed tool (El Khouli et al., 2009). The LHS flagged 9 out of the 10 FASD cases for an assessment (Se = 90%); however, the high-risk flag was set too low, and many participants without FASD were flagged by the LHS for an assessment (PPV=50%). Accuracy statistics cannot be compared to any previous pilot study, as no accuracy statistics are available for the version of the LHS used by the FASD Program. [25] The LHS performed slightly better when predicting CN and FASD (correct prediction = 68%) but performed poorly when classifying ND cases (Sp = 0%; NPV = 0%).

Asante Youth Screen (AYS)

The AYS item comparison for ND, CN and FASD diagnosis outcome groups is illustrated in Table 14. The AYS consists of items on Social Factors (5) and Personal Factors (5), and flags youths with the following scores for a complete FASD assessment (Conry & Asante, 2010):

1. One Social Factor AND 2 or more Personal Factors, OR
2. No Social Factors AND 3 or more Personal Factors.

The AYS was able to distinguish between the ND, CN and FASD groups (χ^2 (2) = 13.726, $p <$ .01). The AYS flagged 100% of the FASD group for an assessment, 33% of the CN group and 0% of the ND group. Subscores were also significantly different for the diagnosis outcome groups, in the expected manner: FASD > CN > ND. The FASD group (M = 1.70, SD = .68) had a significantly higher average Social Factor subscore (F(2, 19) = 5.222, $p < .05$), compared to the CN group (M = 0.89, SD = .60). Furthermore, the FASD group (M = 2.60, SD = .70) had a significantly higher Personal Factor subscore (F (2, 19) = 13.514, $p < .001$), compared to the CN (M = 1.22, SD = .67) and ND (M = 1.00, SD = .00) groups.

Several individual LHS items were also significantly associated with an FASD diagnosis.

1. Suspected or documented FAS/pFAS/ARND[26] was associated with an increased risk of an FASD (50%) diagnosis vs. ND (0%) and CN (0%) diagnosis (χ^2 (2) = 7.765, $p < .05$).

2. Learning difficulties in school was associated with an increased risk of an FASD (90%) diagnosis vs. ND (0%) and CN (11%) diagnosis (χ^2 (2) = 14.785, $p < .01$).

3. Attention Deficit Hyperactivity Disorder was associated with an increased risk of an FASD (70%) diagnosis vs. ND (0%) and CN (22%) diagnosis (χ^2 (2) = 6.878, $p < .05$).

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[25] Grant et al (2013) modified items from the Addiction Severity Index (Mclennan et al., 1992) to create the LHS (AUC = .68; Se = 80.8%; Sp = 65.5%). Grant et al (2013) identified 5 or higher as the cut-off score for FASD diagnosis referral (AUC = .68; sensitivity = .81%; specificity = .66%). The FASD Program used the more recent scoring system provided by the tool developers in 2018.

[26] Fetal alcohol syndrome (FAS), partial FAS (pFAS), and alcohol-related neurodevelopmental disorder (ARND) are three main diagnosis categories under the umbrella term FASD.

4. A previous anxiety disorder was associated with a *reduced* risk of an FASD (0%) diagnosis vs. ND (33%) and CN (0%) diagnosis (χ^2 (2) = 6.635, $p < .05$).

Accuracy statistics for the AYS as an FASD screen, and as a FASD/CN screen, are presented in Table 11. The AYS was a good predictor of FASD (correct prediction rate=86%), but only a fair predictor of both FASD and CN (correct prediction rate=73%). This is unsurprising, since the AYS referral flag was significantly different for the diagnosis outcome groups, and the tool was not designed to predict both FASD and CN. Although cut-off scores are available for the AYS, no accuracy statistics are available. Therefore, no comparisons can be made to prior AUCs.

The AYS correctly identified every FASD case (Se = 100%), and there was a high probability that a participant who flagged as low-risk by the AYS would be diagnosed as ND (NPV = 100%). However, a few persons without FASD were flagged as high-risk by the AYS (PPV = 77%). If CSC wishes to implement a tool that rarely misidentifies persons with high FASD risk, the AYS would be a good tool to explore further. If CSC wishes to implement a tool to flag both FASD and CN cases for further testing, the AYS is less useful. Admittedly, all participants flagged as high-risk by the AYS had CN or FASD (PPV = 100%), but many CN or FASD cases were misclassified as low-risk (Se = 68%). Therefore, there is a high chance that the AYS, if implemented to screen for both FASD and CN, would not provide necessary diagnostic testing and health services for the CN cases.

It should be noted that the FASD Program stopped administering the AYS early in the program. The majority of the AYS data was completed using official/secondary CSC health records found in their EMR-OSCAR database. This method fits with the protocol outlined by the tool developers (Conry & Asante, 2010). The high accuracy of AYS in predicting FASD, combined with the high accuracy when using secondary health records, adds to the utility of the AYS: the screens can be completed after the health data are collected (with permission from inmate), by a trained health professional remotely (e.g., a nurse at NHQ), without unduly traumatizing the participant.

Table 14. Asante Youth Screen Item Distribution

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Social Factors							
Adopted	0%	0%	20%	9%	2.640	2	0.267
Ever in foster care or involved with child protection services	67%	78%	70%	73%	0.209	2	0.901
Sibling with a documented diagnosis of FAS/pFAS/ARND	0%	0%	10%	5%	1.257	2	0.533
Suspected or documented FAS/pFAS/ARND	0%	0%	50%	23%	7.765*	2	0.021
Maternal history of alcoholism or known prenatal alcohol use	0%	11%	20%	14%	0.866	2	0.648
Mean Social Factors Subscore (Max=5)[a]	**0.67 (.58)**	**0.89 (.60)**	**1.70 (.68)**	**1.23 (.75)**	**5.222***	**2, 19**	**0.016**
Personal Factors							
Developmental delay in early childhood	0%	0%	10%	5%	1.257	2	0.533
School learning difficulties	0%	11%	90%	46%	14.785**	2	0.001
Growth deficiency (i.e., short height or low weight)	0%	0%	0%	0%			
Attention Deficit Hyperactivity Disorder (ADHD or ADD) diagnosis	0%	22%	70%	41%	6.878*	2	0.032
Anxiety diagnosis	33%	0%	0%	5%	6.635*	2	0.036
Post-Traumatic Stress Disorder diagnosis	0%	11%	20%	14%	0.866	2	0.648
Depression diagnosis	33%	22%	30%	27%	0.209	2	0.901
Oppositional Defiant Disorder diagnosis	0%	0%	30%	14%	4.168	2	0.124
Conduct Disorder diagnosis	33%	0%	10%	9%	3.043	2	0.218
Substance Misuse Disorder diagnosis	100%	67%	80%	77%	1.501	2	0.472
Attachment Disorder diagnosis	0%	0%	0%	0%			
Mean Personal Factors Subscore (Max=13)[b]	**1.00 (.00)**	**1.22 (.67)**	**2.60 (.70)**	**1.82 (.96)**	**13.514*****	**2, 19**	**0.000**
FASD Referral Recommended	**0%**	**33%**	**100%**	**59%**	**13.726****	**2**	**0.001**

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Note. A detailed breakdown for No Diagnosis (ND), Complex Needs (CN), FASD (with or without SFF) and Total Screened inmates is reported for categorical variables. For continuous scores, the mean and standard deviation are reported. The category CN includes patients with 3 or more neurobehavioural deficits. The CN category includes one patient who received a deferred FASD diagnosis. Chi-square statistic, degree of freedom and *p* -values are reported for categorical variables; the minimum cell count assumption was violated for all chi-square tests and results should be interpreted with caution. For continuous variables, the *F* statistic, degree of freedom and *p* -values are reported, and the Bonferroni post hoc is used to determine differences in group means when the equal variances assumption was not violated; the Welch *F* and Games-Howell post-hoc tests are reported when the equal variances assumption is violated. Due to the small sample size and small size of the ND group, all test results should be interpreted with caution.

[a] The equal variances assumption of the ANOVA test was not violated. The Bonferroni post-hoc test determined that the mean Social Factors were significantly higher for the FASD group compared to the Complex Needs group.

[b] The ANOVA was unable to produce the robust test, the Welch *F* statistic, because at least one group has 0 variance. The Welch *F* is typically reported instead of the ANOVA *F* statistic when the equal variances assumption for ANOVA is violated, that is, the Levene's test p-value is < .05. For this analysis, the less robust F-statistic is reported. According to the Games-Howell post-hoc test, the mean Personal Factors were significantly higher for the FASD group, when compared to the No Diagnosis and Complex Needs groups.

Quick Functional Screening Tool (QFST)

The QFST is a brief, 4-item screen, administered prior to the longer FST (Perry, et al., 2008). The FASD Program administered version 5 of the tool, which flags someone who scores one or more (out of a maximum of 8) for a complete FASD assessment. The results for the QFST are displayed in Table 15 and the accuracy statistics are displayed in Table 11. The QFST decision rule was able to distinguish between the ND, CN and FASD groups (χ^2 (2) = 8.684, $p < .05$). The QFST flagged 100% of the FASD group for an assessment, 44% of the CN group and 33% of the ND group. One item on the QFST, maternal alcohol use during pregnancy, was also significantly different for the FASD (50%), compared to the CN (0%) and ND (0%) groups (χ^2 (4) = 16.832, $p < .01$). Importantly, the mean quick score was also significantly different for the diagnosis outcome groups: the FASD group (M = 2.70, SD = 1.06) had a significantly higher average quick score (F(2, 19) = 7.937, $p < .01$), compared to the CN (M = 0.89, SD = 1.36) and ND (M = 0.33, SD = .58) groups. Although the QFST was intended to screen for FASD, the quick score seems promising as a FASD/CN screen. It might be feasible to use differences in the quick score mean and a larger sample to identify cut-points for a CN (e.g., .5 or higher) and FASD diagnosis.

The QFST had a fair level of accuracy as an FASD screen (correct prediction rate = 77%). As an FASD screen, the QFST correctly flagged all FASD cases (Se = 100%), and all low-risk cases were ND (NPV = 100%). However, some persons flagged as high-risk were actually ND (PPV = 67%) and the tool was less useful at identifying ND cases (Sp = 58%). Given that CSC is likely to be more interested in identifying the FASD cases (i.e., Se), and knowing how many persons referred for a costly diagnosis are likely to test positive (i.e., PPV), the QFST (along with the AYS), is a promising tool deserving of further testing and validation efforts.

The QFST also had a fair level of accuracy as a CN/FASD (correct prediction rate = 73%) screen. The QFST correctly flagged the majority of CN/FASD cases (Se = 74%), and almost all participants screened as high-risk were diagnosed as CN/FASD (PPV = 93%). However, the tool misclassified many of the CN/FASD cases as low-risk and few persons categorized as low-risk were actually ND (NPV = 29%). Furthermore, more than half of participants classified as low-risk were actually diagnosed with CN/FASD (Sp = 67%). Nevertheless, Se and PPV rates are promising enough to support further testing of the QFST as a screen for CN/FASD.

Table 15. Quick Functional Screening Tool Item Distribution

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Client diagnosed with FASD							
Confirmed diagnosis	0%	0%	10%	5%	5.867	4	0.209
Contradictory or unconfirmed history	0%	0%	30%	14%			
No history	100%	100%	60%	82%			
Maternal alcohol use during pregnancy							
Confirmed history	0%	0%	50%	23%	16.832**	4	0.002
Contradictory or unconfirmed history	33%	11%	50%	32%			
No history	67%	89%	0%	46%			
Maternal drug use or misuse of prescription medication during pregnancy							
Confirmed history	0%	22%	20%	18%	5.296	4	0.258
Contradictory or unconfirmed history	0%	0%	30%	14%			
No history	100%	78%	50%	68%			
Sibling(s) diagnosed with FASD							
Confirmed diagnosis	0%	11%	0%	5%	3.178	4	0.529
Contradictory or unconfirmed history	0%	11%	0%	5%			
No history	100%	78%	100%	91%			
Mean Quick Score (Max=8)[a]	0.33 (.58)	0.89 (1.36)	2.70 (1.06)	1.64 (1.50)	7.937**	2, 19	0.003
Quick Score Referral (quick score ≥ 1)	**33%**	**44%**	**100%**	**68%**	**8.684***	**2**	**0.013**

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Note. A detailed breakdown for No Diagnosis (ND), Complex Needs (CN), FASD (with or without SFF) and Total Screened inmates is reported for categorical variables. For continuous scores, the mean and standard deviation are reported. The category CN includes patients with 3 or more neurobehavioural deficits. The CN category includes one patient who received a deferred FASD diagnosis. Chi-square statistic, degree of freedom and *p* -values are reported for categorical variables; the minimum cell count assumption was violated for all chi-square tests and results should be interpreted with caution. For continuous variables, the *F* statistic, degree of freedom and *p* -values are reported, and the Bonferroni post hoc is used to determine differences in group means when the equal variances assumption was not violated; the Welch *F* and Games-Howell post-hoc tests are reported when the equal variances assumption is violated. Due to the small sample size and small size of the ND group, all test results should be interpreted with caution.

[a] Equal variances assumption of the ANOVA test was not violated. The Bonferroni post-hoc test determined that the mean Quick Score was significantly higher for the FASD, compared to both the No Diagnosis and Complex Needs groups.

Functional Screening Tool (FST)

The FST is an FASD screen with items on Wellbeing (7), Social Functioning (2), School/Employment (3), Antisocial/Criminal Issues (4) and Skills (4). The tool was designed to also identify the screened individual's strengths and limitations (Perry, et al., 2008). It flags someone who scores at least 20 (out of a maximum of 40) for a complete FASD assessment. Accordingly, no subscores were computed for the FST. The results for the FST are displayed in Table 16 and the accuracy statistics are displayed in Table 11.

None of the items on the FST distinguished between the diagnosis outcome groups, that is, the statistical analyses to identify group differences in the screen items were all non-significant. The mean screen score (ranging from 0 to 40) and referral category by diagnosis outcomes were also non-significant. Like the BSC-R and AYS, the FST and QFST were created based on the 2005 Canadian FASD guidelines (Chudley et al., 2005). While the AYS and QFST are both promising, the FST was a failed predictor of FASD (correct prediction rate=55%). The FST correctly identified many of the FASD cases (Se=80%); however, many participants classified as low-risk were diagnosed with FASD (NPV=67%). As an FASD screen, the FST cut-score needs to be adjusted as it:

1. missed FASD cases, therefore, participants who require assessment and services would be missed by the screen, and

2. many persons without the condition would be referred for assessment and services (PPV=50%), which would prove costly to CSC.

The FST performed better as a CN/FASD screen, but it was still a poor predictor of CN/FASD (correct prediction rate = 68%). Many of the persons who would be flagged by the FST for a CN/FASD assessment would benefit from said assessment (PPV = 88%), but several persons who would require assessment and treatment (NPV = 17%) would be misclassified as low-risk by the screen. In a litigious country, failure to identify and provide services to that many inmates who require assessment and health services could prove more costly than conducting expensive clinical assessments on too many inmates. In terms of not wasting resources on testing, the AYS (PPV = 100%) would be the superior CN/FASD screen; however, in terms of identifying the most CN/FASD cases, the LHS would be the superior screen (Se = 79%). Although not promising as an FASD or CN/FASD screen, the FST may prove useful in determining treatment plans, as it identifies many criminogenic risks—criminal history; antisocial personality; pro-criminal attitudes; anti-social/criminal networks; employment instability; family or relationship problems; lack of prosocial recreational activities; and substance use—and participants' strengths.

Table 16. Functional Screening Tool Item Distribution

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Wellbeing							
History of Substance Abuse							
Confirmed history	100%	100%	80%	91%	2.640	4	0.620
Contradictory or unconfirmed history	0%	0%	10%	5%			
No history	0%	0%	10%	5%			
Mental health concerns identified by DSM-IV-TR/DSM-IV							
Confirmed diagnosis	67%	67%	70%	68%	3.813	4	0.432
Contradictory or unconfirmed history	33%	11%	0%	9%			
No history	0%	22%	30%	23%			
Brain-related damages NOT resulting from FASD							
Confirmed diagnosis	0%	11%	10%	9%	1.340	4	0.855
Contradictory or unconfirmed history	0%	11%	20%	14%			
No history	100%	78%	70%	77%			
Impulsivity							
Confirmed history	67%	78%	90%	82%	3.395	4	0.494
Contradictory or unconfirmed history	33%	11%	0%	9%			
No history	0%	11%	10%	9%			
Verbal comprehension deficits							
Confirmed history	0%	22%	0%	9%	3.667	4	0.453
Contradictory or unconfirmed history	0%	11%	10%	9%			
No history	100%	67%	90%	82%			
Memory problems							
Confirmed history	33%	11%	50%	32%	7.006	4	0.136
Contradictory or unconfirmed history	0%	33%	40%	32%			
No history	67%	56%	10%	36%			
Intellectual disability							
Confirmed diagnosis	0%	22%	50%	32%	5.783	4	0.216
Contradictory or unconfirmed history	33%	11%	30%	23%			
No history	67%	67%	20%	46%			

Table 16. Functional Screening Tool Item Distribution (Continued)

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Social Functioning							
Hard to care for history							
Confirmed history	67%	56%	70%	64%	4.912	4	0.296
Contradictory or unconfirmed history	33%	0%	10%	9%			
No history	0%	44%	20%	27%			
Interpersonal relationships							
Confirmed history	67%	67%	70%	68%	4.274	4	0.370
Contradictory or unconfirmed history	0%	11%	30%	18%			
No history	33%	22%	0%	14%			
School/Employment							
Academic problems							
Confirmed history	33%	33%	70%	50%	3.187	4	0.527
Contradictory or unconfirmed history	33%	44%	20%	32%			
No history	33%	22%	10%	18%			
Behavioral difficulties in school							
Confirmed history	100%	56%	80%	73%	2.730	2	0.255
Contradictory or unconfirmed history	0%	0%	0%	0%			
No history	0%	44%	20%	27%			
Employment							
Confirmed history	67%	78%	60%	68%	1.459	4	0.834
Contradictory or unconfirmed history	33%	11%	30%	23%			
No history	0%	11%	10%	9%			
Antisocial / Criminal Issues							
Early onset of antisocial behavior							
Confirmed history	67%	67%	80%	73%	2.119	4	0.714
Contradictory or unconfirmed history	33%	11%	10%	14%			
No history	0%	22%	10%	14%			
Adolescent criminal history							
Confirmed history	100%	78%	90%	86%	1.923	4	0.750
Contradictory or unconfirmed history	0%	11%	10%	9%			
No history	0%	11%	0%	5%			

Table 16. Functional Screening Tool Item Distribution (Continued)

	ND *n* =3	CN *n* =9	FASD *n* =10	Total *N* =22	Test Statistic	df	p-value
Abide by court ordered conditions							
Confirmed history	100%	89%	70%	82%	2.295	4	0.682
Contradictory or unconfirmed history	0%	0%	10%	5%			
No history	0%	11%	20%	14%			
Associating with antisocial individuals							
Confirmed history	33%	78%	80%	73%	9.167†	4	0.057
Contradictory or unconfirmed history	67%	0%	20%	18%			
No history	0%	22%	0%	9%			
Skills							
Self-care skills to manage the fundamental demands of life							
Confirmed history of lacking self-care skills	0%	0%	0%	0%	2.506	2	0.286
Contradictory or unconfirmed history	0%	33%	10%	18%			
No history of self-care skills lack	100%	67%	90%	82%			
Problem solving skills							
Confirmed history of struggle	33%	44%	20%	32%	3.283	4	0.512
Contradictory or unconfirmed history	67%	44%	80%	64%			
No history of poor problem solving skills	0%	11%	0%	5%			
Emotional capacity or emotional reactions to life events							
Confirmed history of struggle	33%	33%	40%	36%	0.489	4	0.975
Contradictory or unconfirmed history	33%	33%	40%	36%			
No history of struggle	33%	33%	20%	27%			
Prosocial leisure activities							
Confirmed history of struggle	33%	11%	30%	23%	1.946	4	0.746
Contradictory or unconfirmed history	67%	67%	60%	64%			
History of prosocial pursuits	0%	22%	10%	14%			
Mean Function Screen Tool Score (Max=40)[a]	**24.67 (7.57)**	**23.56 (8.03)**	**26.60 (7.11)**	**25.09 (7.34)**	**0.390**	**2, 19**	**0.682**
Referral (score ≥ 21)	**67%**	**67%**	**80%**	**73%**	**0.489**	**2**	**0.783**

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Notes continue on the next page

Note. A detailed breakdown for No Diagnosis (ND), Complex Needs (CN), FASD (with or without SFF) and Total Screened inmates is reported for categorical variables. For continuous scores, the mean and standard deviation are reported. The category CN includes participants with 3 or more neurobehavioural deficits. The CN category includes one participant who received a deferred FASD diagnosis. No differences were found between diagnosis categories and the subscores or the total score. However, the item "Associating with Antisocial Individuals," was almost statistically significant. Chi-square statistic, degree of freedom and *p*-values are reported for categorical variables; the minimum cell count assumption was violated for all chi-square tests and results should be interpreted with caution. For continuous variables, the *F* statistic, degree of freedom and p-values are reported, and the Bonferroni post-hoc is used to determine differences in group means when the equal variances assumption was not violated; the Welch *F* and Games-Howell post-hoc tests are reported when the equal variances assumption is violated. Due to the small sample size and small size of the ND group, all test results should be interpreted with caution.

[a] The equal variances assumption of the ANOVA test was not violated.

Brief Screen Index (BSI)

The BSI contains items on Maternal Health (3), Childhood System Contacts (3), Criminal History (3), Dependent Living in Adulthood (3), Childhood Foster Placements (3), Health History (3), Substance Use (3), and Impulsivity (3). Unlike the previous screens, the BSI used the most recent Canadian FASD guidelines (Cook et al., 2016) as its theoretical reference standard. However, the tool has not been pilot tested. Therefore, the tool has no decision rule or cut-off score to flag screened individuals for a complete FASD assessment. The results for the BSI are displayed in Table 17; no accuracy statistics are provided.

A subscore was computed for each item on the BSI, and the mean was computed for the tool. One subscore, multiple placements before the age of 18, appeared to be significant ($F(2, 17) = 3.959$, $p < .05$). However, the Bonferroni post-hoc did not identify any significant mean differences in the FASD ($M = 1.89$, $SD = 1.27$), CN ($M = 0.75$, $SD = .71$) and ND ($M = 2.33$, $SD = .58$) groups. One item in the Maternal Health section, mother's alcohol use history, was more likely to occur with the FASD group (100%) compared to the CN (38%) and ND (67%) groups (χ^2 (2) = 7.897, $p < .05$). Overall, the BSI scoring system was problematic, as the ND group had the highest risk score ($M = 16.67$, $SD = 1.53$) and was virtually indistinguishable from the FASD ($M = 15.78$, $SD = 2.68$) and CN ($M = 14.00$, $SD = 2.00$) group scores. There is insufficient data to make any conclusions about the BSI: a larger sample may reveal patterns and a feasible decision rule which could not be discerned from a sample of 20 cases.

Table 17. Brief Screen Index Item Distribution

	ND *n* =3	CN *n* =8	FASD *n* =9	Total *N* =20	Test Statistic	df	p-value
Maternal health, liver disease and alcohol use							
Birth mother had poor health	33%	25%	22%	25%	0.148	2	0.929
Birth mother had liver disease or dying as a result of liver disease	0%	13%	22%	15%	0.937	2	0.626
Maternal history of alcohol use	67%	38%	100%	70%	7.897*	2	0.019
Mean Subscore (Max=3)	1.00 (1.00)	.75 (.71)	1.44 (.73)	1.10 (.79)	1.817	2, 17	0.193
Problematic crisscrossing of systems[a]							
1 service/system referral	0%	0%	0%	0%			
2 services/systems referral	0%	13%	11%	10%			
3 or more services/systems referral	100%	88%	89%	90%			
Mean Subscore (Max=3)	3.00 (.00)	2.88 (.35)	2.89 (.33)	2.90 (.31)	0.174	2, 17	0.842
Prior Criminal and System Generated Record[a]							
less than 15 priors	0%	0%	22%	10%			
15+ priors	0%	0%	22%	10%			
15+ priors and 33% court generated offenses	100%	100%	56%	80%			
Mean Subscore (Max=3)[e]	3.00 (.00)	3.00 (.00)	2.33 (.87)	2.70 (.66)	3.117†	2, 17	0.070
Dependent living in Adulthood[a]							
≤ 1/3 in assisted living	0%	13%	11%	10%			
> 1/3 to < 2/3 in assisted living	33%	25%	0%	15%			
≥ 2/3 in assisted living	67%	63%	89%	75%			
Mean Subscore (Max=3)	2.67 (.58)	2.50 (.76)	2.78 (.67)	2.65 (.67)	0.339	2, 17	0.717
Multiple placements before the age of 18[a]							
< 3 foster care placements	0%	38%	22%	25%			
3 foster care placements	0%	50%	11%	25%			
4-9 foster care placements	67%	13%	22%	25%			
> 9 foster care placements	33%	0%	44%	25%			
Mean Subscore (Max=3)	2.33 (.58)	0.75 (.71)	1.89 (1.27)	1.50 (1.15)	3.959*	2, 17	0.039

Table 17. Brief Screen Index Item Distribution (Continued)

	ND *n* =3	CN *n* =8	FASD *n* =9	Total *N* =20	Test Statistic	df	p-value
Head injury, loss of consciousness and childhood adversity[b]							
No head injury[c]	67%	38%	78%	60%	2.928	2	0.231
No loss of consciousness from head injury[d]	67%	50%	78%	65%	1.441	2	0.487
No childhood abuse (physical, neglect and sexual, emotional)?	67%	75%	22%	50%	5.111†	2	0.078
Mean Subscore (Max=3)	2.00 (1.00)	1.63 (1.06)	1.78 (1.09)	1.75 (1.02)	0.140	2, 17	0.871
Alcohol use, blackouts and solvents[b]							
No harmful alcohol use	33%	13%	0%	10%	2.870	2	0.238
No drug abuse	33%	25%	22%	25%	0.148	2	0.929
No solvents use	100%	50%	56%	60%	2.407	2	0.300
Mean Subscore (Max=3)	1.67 (.58)	0.88 (.99)	0.78 (.67)	0.95 (.83)	1.419	2, 17	0.269
Impulsivity							
Diagnosed with ADHD in childhood or adulthood	33%	38%	89%	60%	5.706†	2	0.058
Committed a driving offense and/or car theft offense	33%	63%	44%	50%	0.944	2	0.624
Indiscriminate sex and/or short-term relationships	33%	63%	56%	55%	0.752	2	0.687
Mean Subscore (Max=3)	1.00 (1.00)	1.63 (.74)	1.89 (.78)	1.65 (.81)	1.410	2, 17	0.271
Mean BSI score (Max=24)	**16.67 (1.53)**	**14.00 (2.00)**	**15.78 (2.68)**	**15.20 (2.42)**	**1.976**	**2, 17**	**0.169**

***Significant at the 0.001 level, **Significant at the 0.01 level, *Significant at the 0.05 level, †Significant at the 0.1 level.

Note. A detailed breakdown for No Diagnosis (ND), Complex Needs (CN), FASD (with or without SFF) and Total Screened inmates is reported for categorical variables. For continuous scores, the mean and standard deviation are reported. The category CN includes patients with 3 or more neurobehavioural deficits. The CN category includes one patient who received a deferred FASD diagnosis. Chi-square statistic, degree of freedom and p-values are reported for categorical variables; the minimum cell count assumption was violated for all chi-square tests and results should be interpreted with caution. For continuous variables, the F-statistic, degree of freedom and p-values are reported, and the Bonferroni post hoc is used to determine differences in group means when the equal variances assumption was not violated; the Welch F and Games-Howell post-hoc tests are reported when the equal variances assumption is violated. Due to the small sample size and small size of the ND group, all test results should be interpreted with caution. Post hoc tests were inconclusive on group differences on mean "Placements before age 18."

[a] A detailed breakdown for these variables is presented; however, significance test is provided for the subscore as is appropriate for a continuous construct.

[b] These items are reversed scored, i.e., 1 point is assigned in the absence of a head injury, loss of consciousness, childhood abuse, alcohol use, blackouts and solvent use.

[c] Self-reported history is inconsistent with patients' prison health records (No Diagnosis=33%; Complex Needs=25%; FASD=44%; Total cases=35%).

[d] Self-reported history is inconsistent with patients' prison health records (No Diagnosis=0%; Complex Needs=25%; FASD=22%; Total cases=20%).

[e] The ANOVA was unable to produce the robust test, the Welch *F* statistic, because at least one group has 0 variance. The Welch *F* is typically reported instead of the ANOVA *F* statistic when the equal variances assumption for ANOVA is violated, that is, the Levene's test p-value is < .05. For this analysis, the less robust F-statistic is reported. The Games-Howel post-hoc test did not identify any signifcant differences between the group means.

Treatment Recommendations

As described in Chapter 3, the FASD Program holds a clinic (i.e., case conference) for each assessed participant. During the clinic, the FASD Team reviewed the participant health record, neurodevelopmental domains and facial features measurements; determined the diagnosis; and designed a treatment plan for the respective participant. Each treatment plan included institutional, transitional and community recommendations (see Appendix G). Institutional and transitional recommendations were intended to be implemented within RPC—or another CSC facility, if the participant is transferred prior to community release. However, due to the brief period between assessment and community release, the vast majority of institutional and transitional treatment recommendations were not implemented in year 1 of the FASD Program.[27] The social worker assigned to the respective participant worked with participants' families, community agencies and service providers to arrange the community treatment recommendations prior to the participant's release into the community.[28] Due to the difficulties in accessing CSC data, the treatment plans analysis utilized the treatment recommendations contained in participants' final medical report. No information was obtained verifying which recommendations were actually implemented.

This section describes the treatment plans recommended by the FASD Team members present at the clinic meetings for the 25 assessed participants.[29] Themes and subthemes are discussed for institutional and community recommendations. Themes and subthemes may reoccur in individual participant's treatment recommendations, as multiple diagnosis, health or mental health recommendations may be suggested for a particular participant. Summary counts for the thematic analysis (i.e., counted once per participant) are displayed in Table 18; themes and subthemes observed in institutional and community treatment plans are presented in Appendix H. The summary counts are provided for reference; recommendations are based on the participant diagnosis and strengths, family support and available supports in the release community. Although recommendations were coded in one category only, it should be noted that community mental health agencies often provide services that cross multiple categories (e.g., community health, cultural and other community supports or services), and cultural community agencies may provide mental health and addictions treatment, family reunification support and primary health services.

Institutional Recommendations

[27] Mental Health - National Headquarters, the department which funded the FASD Program pilot in RPC, planned to begin pilot testing implementing treatment recommendations in RPC in April 2020. However, this was delayed due to the COVID-19 pandemic.

[28] Ideally, discharge plans are arranged and finalized prior to the inmate's release. However, changes to the discharge community immediately prior to release may limit the social workers' success in finalizing discharge plans.

[29] Clinic attendance is not required for all members of the FASD Team. Attendance ranged from five to thirteen team members. The FASD Network was present for seven clinics: CN=2, FASD with SFF=2 and FASD without SFF=3.

The FASD Program's institutional recommendations were designed to prepare the participant for release into the community. The FASD Program took a multi-prong approach to: stabilize the participant through diagnosis specific, mental health and addictions, and health recommendations; and prepare the participant for community release (including completing any final programming). Each of these themes, along with their subthemes, are discussed below.

Table 18. Treatment Recommendations: Thematic Analysis Summary

Theme	ND *n* =3	CN *n* =10	FASD without SFF *n* =9	FASD with SFF *n* =3	Total *N* =25
Institutional Recommendations					
Functioning					
Diagnosis Specific	3	9	8	3	23
Spiritual, Mental and Primary Health					
Cultural/Religious Services/Supports	1	3	3	0	7
Mental Health & Addictions Services/Supports	3	8	4	1	16
Primary Health Services/Supports	1	3	4	1	9
Release Preparation					
Reintegration Preparation	2	5	4	1	12
Programming	1	4	1	1	7
Community Recommendations					
Functioning					
Identification	2	2	4	1	9
Safety	1	2	3	1	7
Housing	1	8	7	3	19
Financial Stability					
Financial/Disability Benefits	2	8	9	3	22
Employment	3	4	5	3	15
Spiritual, Mental and Primary Health					
Cultural/Religious Services/Supports	1	5	3	1	10
Mental Health & Addictions Services/Supports	3	10	9	3	25
Primary Health Services/Supports	3	5	5	2	15
Re-Integration					
Family Reunification	1	2	2	1	6
Community Supports/Service	2	6	8	3	19
Parole Officer Contact	2	7	6	2	17

Functioning: Diagnosis Specific

Several subthemes occurred in diagnosis specific recommendations. Diagnosis specific recommendations begin inside RPC and are intended to assist internal staff in obtaining participant compliance with institutional rules, stabilizing the participant and teaching the participant appropriate life and coping skills to aid their function in the release community. For

participants with CN or FASD, the FASD Team provided advice to RPC staff on best practices and provided concrete recommendations when dealing with participants with impaired cognition, for example, use short, simple and concrete sentences; repeat instructions; and ask participants to repeat instructions in their own words to ensure participants actually understand instructions. Copies of the participant medical report and the FASD medical algorithm—a tool to assist psychiatrists in identifying appropriate medication to stabilize participants—were provided to psychiatrists in RPC—to further stabilize participants prior to community release.

For participants with FASD and CN, the FASD Team recommended contacting the relevant FASD Community Support organization that provides services in the release community (some FASD Community Support organizations, for example, the FASD Network, provide supports to individuals with cognitive impairments or FASD). Attempts were made to arrange a pre-release meeting between the FASD Network and participants scheduled for release in Saskatchewan. The Team also identified mental health agencies in the participants' release community and recommended sharing advice and information on best practices, a copy of the participants' medical report, and the FASD medical algorithm to mental health organizations in the release community.

The FASD Team provided diagnosis specific recommendations to assist participants in improving their coping skills and life skills. Advice to improve participants' coping skills included strategies to reduce self-harm, improve self-regulation and regulate emotions. These strategies were concrete and targeted individual participant's strengths and cognitive impairments, for example, daily exercise routine to provide structure, information on personal triggers, and role playing, and art to help with anger management. Advice was also provided to staff on how best to support participants' efforts to improve their coping skills. Coping and life skills strategy recommendations began in RPC and extended to community release: the FASD Team provided concrete recommendations to improve participants' life skills, for example, calendars, clocks and cell phones for time management; and mentors in RPC and the community to assist with money management and problem-solving skills. Community agencies and supports are discussed in further detail in the "Community Recommendations" section below.

Spiritual, Mental and Primary Health

The FASD Team noted when Indigenous culture or religion was important to participants and recommended participants continue programming and/or involvement in activities at the RPC Cultural Centre (e.g., smudges, feasts, sweat lodge ceremonies) or Chapel. Indigenous participants who were not actively involved in the Cultural Centre were encouraged to connect with the Cultural Centre and RPC Elders.

The FASD Team provided treatment recommendations to address mental health or addictions issues (excluding FASD) discovered in the assessment process. Recommendations included addictions treatment (including group treatment, social support groups and counselling), counselling to address mental health issues, referrals to RPC psychiatrists and mental health treatment programs in RPC. Compliance with medication regime and treatment recommendations, especially with alcohol and drug programming, was a common theme for all

participant subgroups. To this end, advice was provided to RPC staff (e.g., encourage participant compliance with medication regime, develop strategies for medication compliance with cue cards) and participants (e.g., continue attending Alcohol Anonymous meetings, and maintain sobriety). Some compliance recommendations were ambiguous, however, and it was difficult to determine if the advice was intended for staff or participants, for example, write down the pros/cons of taking medications would be most useful if done by or in collaboration with the participant, but appeared with another recommendation clearly intended for RPC staff, "[d]evelop strategies for medication compliance with cue cards".

Health recommendations were predominantly related to advice and education on basic activities of daily living (ADL) activities (i.e., ambulating (moving and walking independently), feeding, dressing, personal hygiene, bladder and bowel control, and toileting; see Edemekong et al., 2020), diet, exercise and reproductive health. Recommendations pertaining to instrumental ADL (i.e., transportation and shopping, money management and managing medications, home maintenance, meal preparation, managing communications with others; see Edemekong et al., 2020) are discussed in the "Community Recommendations" section below. Referrals were provided for testing by the RPC Regional Hospital, as needed. The FASD Team made specific recommendations to facilitate the continuation of participants' spiritual, mental and primary health care in the community, also discussed in the "Community Recommendations" section below.

Release Preparation

Community release preparation included educational skills/training, work experience and completion of institutional programming to improve participants' likelihood of successful community reintegration. The FASD Team recommended participants begin or continue institutional employment on or off unit, work readiness programs, or upgrade their education to grade 12 prior to their community release. The Team recommended the National Employment Skills Program (NESP) and Learning Resource Centre (LRC) for participants to improve their soft employment skills (e.g., communication and problem-solving skills) and obtain their high-school equivalency, respectively. Referrals to STR8 UP (a non-profit community agency that helps Indigenous persons desist from gang activity) were recommended for Indigenous participants at risk of recruitment by gangs or resumption of gang activities post-release. Finally, the FASD Team recommended participants complete/continue their Integrated Correctional Program Model (ICPM) programming, or refresh the programming if impairments were discovered during the diagnosis process and the participant had previously completed the ICPM programming. ICPM is a holistic programming model, which uses risk assessments tools to identify individual inmate's criminogenic risk and needs, and attempts to address those needs from intake to community discharge (CSC, 2018); discovery of new needs would indicate modification to the ICPM programming is warranted.

Community Recommendations

Community recommendations complemented and/or tried to facilitate the continuation of supports and services discussed in the prior "Institutional Recommendations" section above. The

FASD Program's community recommendations attempted to address participants' criminogenic risk and needs (Andrews & Bonta, 2010; Bonta & Andrews; 2007) and facilitate community reintegration:

1. **Pro-criminal attitudes**: recommended counselling, programming and mentorships available via community service/supports.

2. **Antisocial/criminal networks**: recommended community service agency referral to support gang desistence; and culturally appropriate community supports.

3. **Employment instability**: recommended referrals to employment agencies; training/education; mentorship/advice; recommended financial assistance for disabled participants unable to work.

4. **Family or relationship problems**: provided family reunification support.

5. **Absence of prosocial recreational activities**: recommended leisure activities available via the local YMCA or library; and culturally appropriate community supports.

6. **Substance use**: provided referrals to community mental health and addiction organizations for treatment and mentoring.

The FASD Team also provided recommendations to help participants obtain housing stability and access health care in the community. Although the FASD Team made specific community recommendations, it should be noted that social workers follow institutional guidelines when designing and arranging discharge plans. Housing access, primary and mental health care, finances and community referrals are standard components of discharge plans, and the social worker responsible for creating participants' discharge plans will typically include these components, even if they are not specifically recommended by the FASD Team.[30] Low counts of these themes in Table 19 should not be taken as a lack of provision of these community supports; instead, counts of community recommendations represent the FASD Team's plan. The Evaluation Team did not obtain discharge plan data and was unable to verify which recommendations were implemented by social workers. The following subsections describe the themes and subthemes observed in the FASD Team's community recommendations for the 25 assessed participants.

Functioning: Identification, Safety and Housing

Identifications such as birth certificates and SIN cards are required to access government programs, and access many services in the community, for example, opening a bank account, purchasing a cell phone plan, obtaining internet/telephone/television access and securing rental property. Human Resources departments also require SIN numbers and proof of identification to process salaries. The FASD Team recommended social workers apply for SIN cards and birth

[30] Source: Social Worker interview

certificates for participants without identification. As noted previously, prior to release, the social worker would ideally verify whether the participant had identification and take the necessary steps to secure these documents even if this recommendation was not explicitly stated in the FASD Team's treatment recommendations. Due to participants' cognitive and limitations with instrumental ADL—transportation and shopping, money management and managing medications, home maintenance, meal preparation, managing communications with others—the FASD Team recommended supported housing with caregivers/mentors and specific measures to ensure participants' safety and functioning in the community. Safety measures included education for staff or participant about FASD and CN, as well as escorted travel by RPC staff to participants' housing location upon release from RPC.

The FASD Team frequently made several housing recommendations for each participant. Several participants needed support with life skills and ADL, which resulted in the FASD Team recommending supported housing with mentors, caregivers or aid workers. Participants also had low IQ levels, which the FASD Team anticipated would make independent living a challenge. The Team recommended housing types to help participants become as independent as possible with their existing cognitive and life skills limitations, while formulating contingency housing plans. For CN and FASD participants, the FASD Team simultaneously recommended several of the following housing options:

1. Transitional housing at Community Correctional Centres (CCC), community-based residential facilities (CRFs) or community organizations that provide housing for released inmates (e.g., The John Howard Independence Apartments, Edmonton; Bedford House, Calgary; Berkana House, Calgary; Calgary Mustard Seed, Calgary; and YMCA), and supported housing). CCCs are operated by CSC and provide housing for offenders on full parole[31] in a structured living environment with 24-hour supervision, while CRFs are owned by non-governmental agencies under contract with CSC to provide housing, counselling, and supervision for offenders on day parole (Correctional Service Canada [CSC], n.d.; Bell & Trevethan, 2004).

2. Supported housing with caregivers or mentors to assist with instrumental ADL (i.e., transportation and shopping, money management and managing medications, home maintenance, meal preparation, managing communications with others; see Edemekong et al., 2020)

3. Applying for disability funding (e.g., Community Living Disability Services (CDLS), Cognitive Disability Strategies (CDS)) to support community living or semi-independent living for persons with disabilities; and

4. Permanent supported housing.

[31] Offenders on Unescorted Temporary Absences, Work Release, Day Parole, Statutory Release and Long-Term Supervision Orders by the Parole Board of Canada, may also reside in one of the 14 Canadian CCCs (CSC, n.d.)

The FASD Team generally recommended participants transfer from RPC to transitional housing, and subsequently to live as independently as possible, (e.g., obtain funding for supported housing or for semi-independent living). Permanent supported housing was only recommended for severely impaired participants.

Financial Stability: Disability Benefits and Employment

Similar to housing recommendations, the FASD Team recommended independent living as much as possible within the confines of participants' cognitive impairments and life skills limitations. Given the difficulties ex-inmates encounter in obtaining employment post-release, and the prevalence of impaired cognitive and life skills among participants, the FASD Team recommended both disability benefits and referrals to employment agencies in the release communities. Application for financial or disability benefits frequently included a recommendation to appoint a trustee or guardian to help individual participants with money management. The FASD Team also recommended referrals to employment agencies, which provided mentorships, career advice, training and job placements. Employment subthemes observed in recommendations for participants with CN and FASD included supported employment and volunteer opportunities, while full-time employment was recommended for ND participants.

Spiritual, Mental and Primary Health Care

Community supports/services recommendations complemented the institutional recommendations for spiritual, physical and mental health to stabilize participants and attempted to ensure this stabilization continued in the release community. Community organizations were characterized by their primary services; however, there was a great deal of overlap between organizations, as spiritual or faith-based community organizations often provided services for addictions recovery, anger management, family reunification support, primary health care, housing support and employment training/placements. On the other hand, many community mental health and general community support organizations provided culturally appropriate services and took a holistic approach to health (e.g., The Mustard Seed; the Eagle Urban Transition Centre, and Native Addictions Council of Manitoba). There was also a great deal of overlap between community organizations that provided spiritual, mental and primary health support, with organizations that provided re-integration services (discussed in the "Re-integration" section below).

Many participants were provided with referrals and contact information for community-based cultural services and supports (e.g., the Calgary Friendship Centre, the Canadian Native Friendship Centre, Children Services - Metis Nation of Alberta, Elder and Aboriginal Liaison at John Howard Society, Boys with Braids, Circle of Life Thunderbird House and the Bent Arrow Traditional Healing Society) or for Band Members and Elders in the release community. Community-based spiritual referrals were also provided for Christian participants (e.g., The Mustard Seed). Community spiritual and cultural organizations often provided mental health/addictions and primary health care to released inmates. The Mustard Seed provides faith-based mental health, addictions, and counselling services, along with health supports (e.g.,

chiropractic services, physiotherapeutic services, occupational therapy and medication management; The Mustard Seed, n.d.), while the Native Addictions Council Manitoba provided treatment for drug and alcohol addictions and anger management treatment, along with traditional learning circles (Native Addictions Council of Manitoba, n.d.). Other faith-based community organizations focused on addictions recovery (e.g., Alcoholics Anonymous).

Every participant received at least one community recommendation to address their mental health and addiction needs. As noted previously, culturally appropriate mental health and addictions recommendations were made when available in the release community, while other recommendations focused on the severity of participants' mental health and addictions issues. Recommendations for community mental health services/supports ranged from general psychiatric (including FASD) treatment (e.g., psychoeducation, supports for persons with cognitive disabilities, sex offender treatment, counselling, and group programs) to wrap-around services for justice involved persons with serious mental health illnesses (e.g., Forensic Assertive Community Team (FACT), Assertive Community Treatment Teams (ACTT), Forensic Assessment Community Services (FACS)).

The FASD Team recommended the social worker obtain health cards for participants to access primary and mental health care in the community. Referrals were also provided to community organizations that provided primary health care, prescriptions, dental, chronic illness care, occupational therapy, physical therapy, and medication management. At times, primary health and wellness care was provided by a faith-based or spiritual organization (e.g., The Mustard Seed, Eagle Urban Transition Centre) while, at other times, referrals were provided for family doctors and clinics available in the release community.

Re-Integration: Family Reunification, Community Supports/Services and Parole Officer Contact

The FASD Team treatment recommendations occasionally included family contact information and reunification advice. As a copy of the assessment and treatment recommendations was provided to participants, this information would potentially help participants contact their family members upon release, if contact was not maintained during the participant's custodial sentence. Family reunification was also supported by community organizations: community support and service recommendations included family counselling, family/caregiver education/training and anger management—which could potentially assist in family reunification—in addition to re-integration supports and services. Case management, gang-desistence programs, mentorship, literacy and public speaking, life skills training and community re-integration programs were common sub-themes observed in the FASD Team's community supports/services recommendations. Finally, the FASD Team provided participants with the contact information for the parole officer who would be responsible for supervising the participant in the community. Several Indigenous participants were referred to the Indigenous liaison officer at their local parole office, in addition to their parole officer.

5. FASD Team (Staff and Stakeholders) Interviews

The strengths, challenges, and lessons learned in the FASD pilot project were identified through interviews (n = 11) with staff (i.e., lead clinician, program Coordinator, administrative assistant, neuropsychologist, occupational therapist, psychologist, and social workers) and stakeholders (i.e., community mental health specialist and FASD Network members). The interviews were conducted face-to-face and audio-recorded with the consent of the participants. The audio-recordings were transcribed verbatim and analyzed for emergent themes related to the strengths and challenges as perceived by the staff and stakeholders of the program as well as the lessons learned. The themes are presented under three subsections: perceived strengths of the project, perceived challenges of the project, and lessons learned by the FASD team.

Perceived Strengths of the Project

The analysis of the interviews indicated some key strengths of the project as perceived by the FASD team and stakeholders. Notably, the interdisciplinary approach of the project, having experienced and passionate staff, the support of the community (specifically the FASD Network) for the project, and the fact that the project provided a diagnosis for the patients were the most frequently mentioned strengths of the project.

Interdisciplinary Aspect

The project brought together an interdisciplinary team including a psychologist, a psychiatrist, occupational therapists, social workers, and community supports. Almost all interviewees mentioned the interdisciplinary aspect of the project as one of its most important strengths. One participant said it has been a challenge to have the psychiatry department involved in similar projects before but, in this project, the psychiatry department took the lead. Moreover, the interviewees stated that the FASD team members were all open to working with the staff from other disciplines and they were open-minded to each other's views regarding the diagnosis and release process. One social worker said:

> *"… I've never once felt that… when I had an opinion, that it wasn't appreciated. Which is really nice, that you can kinda really vocalize your concerns… And the positives."*

Experienced and Passionate Staff

The majority of the interviewees mentioned that the staff working in this pilot project were very enthusiastic and passionate about making a difference in the lives of the clients. The staff contributed to this project in addition to doing their own clinical work, which shows the enthusiasm they had for this project.

> "*… realistically, sometimes when you work in prison that's hard to find. It's hard to find people that are passionate about the clients. And so I think that's a big strength of that team*.".

The Coordinator's experience and enthusiasm were frequently appreciated in the interviews. She had been working in similar institutions and with similar patients for more than 30 years and the clinicians had more than 10 years of experience of involvement in similar projects. The nursing background of the Program Coordinator enabled the team to complete the healthcare consent and program consent process smoothly. Reaching out to the birth parents and interviewing them was one of the most important successes of the coordinator and the project. Also, data collection on the history of the clients was completed by the Coordinator and her assistant with success, which was not an easy task because these data were being gathered from various sources including the family members of the patients and multiple databases.

Family Connection

The project was successful in reaching a sufficient number of clients and a high percent of maternal confirmation for the clients. The project team planned to reach 35-40 clients and 32 clients were assessed at the end. In the literature, the maximum rate of maternal confirmation is around 50% while, in this project, there was a 60-70% success rate of maternal confirmation. One staff member said:

> "*I know the literature a little bit, so I can say that one of the things that worked really, really well is that we had an experienced Coordinator with a background like none other, who was able to get maternal confirmation in probably the highest that I've ever seen in any study*."

Evidence-based Approach

Another strength of the project is that it is not only based on medical diagnosis but also on scientific evidence through the employment of appropriate tests and screening tools. Further, having a structured research program and an evaluation framework behind the project is considered an advantage by the program staff as such an approach required formal program development in a structured way.

> *"It's been called for a really long time, just having something more formalized, a more structured assessment process, for whatever the concern is."*

Institutional Support

The project was supported by the RPC at various stages including the logistics and program implementation. For instance, the project team usually did not have problems with finding space for assessments and meetings whereas similar programs had some limitations in that respect. Also, when the project asked for the list of eligible participants who are going to be released within a certain period, the RPC provided their names. When asked about the easiest component of the project, one staff member said:

> *"Getting the list was probably one of the easiest things. I mean, we just sent a note, "Can you give us the names of those who are being released". That was really easy to implement."*

Community Support

An important component that was mentioned by the participants as a factor behind the success of the project was community support. One of the key organizations that provided community support to the project was the FASD Network. The FASD Network worked with the social workers and the FASD team to provide the clients with the community resources that they need when they are released. They helped the clients pursue their daily living and follow their instructions in the release plan such as going to doctor and parole appointments on time. The FASD Network set up a resource package for the client. If the client is diagnosed, they are referred to relevant community agencies such as the Community Living Service Delivery (CLSD) for housing needs, the Cognitive Disability Strategy (CDS) to provide the clients with a mentor if they want, or Mental Health & Addictions Services which supports the clients through an outreach worker. One of the core team members said:

> "*We were strong in that we were connected with the community, almost immediately, and the community remained engaged throughout*."

The FASD Network supported the project without receiving any external funding. They attended some of the onsite meetings. In some cases, they met the clients prior to their release to build rapport and introduce their support to the clients. Bringing the support people into the institution and having the client meet the people who are going to support them when they are released is an important achievement of the project.

> *"Bringing them into the institution doesn't happen. So that's like an extra… like an added bonus of what we did in the pilot project, which I think was above and beyond what we normally do. The social workers are really good at making those connections and calling and sending those reports and sharing information. Um… but, yeah, the opportunity to have that participant meet somebody who they're actually going to be working with, or who's available to them out in the community, doesn't normally happen except for in the pilot project. So that was cool!"*

Awareness of Stakeholders and Staff

The project raised the awareness and understanding of the stakeholders and staff on the fact that there is a need to address FASD. Most importantly, the fact that CSC as a whole had acknowledged the need for addressing this issue through this pilot project is an important strength of the project.

> *"It was the enthusiasm, and the staff's interest, and the staff's community, um… understanding that there is a need to address FASD."*

Providing Diagnosis

Those who are diagnosed with FASD are provided with a package of information, including a summary of their final report and a contact list for the support services that they will need when they are released. With the diagnosis, the clients can access numerous community resources such as housing, income support, and tax credits. Normally, the diagnosis is a very expensive process out of the institution. Thus, patients benefit from having this service provided to them while they are staying in the institution. Also, with the diagnosis, the patients can better understand the underlying reasons for their antisocial behaviours and their impulsivity. According to the participants, the fact that the patients are being heard and their challenges are recognized has a positive impact on them.

> *"They (the patients) really enjoyed, you know, working with everybody, and having that kind of support in place already? … And then getting the diagnosis and knowing that they have access to supports has been very helpful for them."*

Staff Training

Through the FASD project, training sessions were held for RPC staff, including staff from outside of the clinical team such as kitchen workers, housekeeping, and maintenance people. The members of the core team, which consisted of the Coordinator, physician, and psychologist, were already formally trained in accordance with the Canadian FASD guidelines.

> *"The core members of the team were all formally trained in the way the current FASD [Canadian guidelines] would recommend treatment…."*

In order to raise the awareness of the rest of the team and the whole institution about FASD, a formal training session was provided by the members of the FASD team including an experienced psychologist, case manager and a physician (on June 6 or 7, 2018). The training included a full day of classes and then a half day hands-on clinic with the staff. The clinic allowed them to see how an assessment is completed, how the reports are written, and how the diagnoses and recommendations are decided.

> *"It was open to the whole institution, by which time we had noted those who were interested in becoming team B members. They were fully invited, and fully present for that training."*

Positive (and Negative) Effects on Patients

According to the staff interviewed, the perceived impact of the pilot project on the patients was generally positive. The most important effects were the opportunities and awareness that resulted from being provided with the FASD diagnosis. Staff believed that there were three reasons which explained why patients appreciated being diagnosed. First, with the diagnosis, they had an explanation for their negative attitudes and a better understanding of the reasons why negative incidents have happened in their lives. One of the staff shared their perception of how one patient felt after the diagnosis:

> *"There was one patient that he… in discussing with him after the feedback… he appreciated kind of, just more of an understanding of the difficulties he obviously was very aware of. And so just… that understanding of, "I'm not broken, my brain is just different" sorta thing? He'll have many, many years of ongoing struggle still, but that did resonate with him, and he will understand."*

Second, as the patients find out their strengths and deficits through the assessment and diagnosis, both the people who support them and the clients themselves started to find ways to remedy their deficits and build more on their strengths. This impact was explained by the psychiatrist:

> *"Knowledge of the deficits allows you to flourish, because now people have an explanation of why you're behaving how you're behaving, so that they can actually correct those deficits. Not only deficits, but also it now strengthens what… or brings out what strengths you have, so you can now … divest those strengths to where they're needed."*

Third, having an FASD diagnosis opened many doors for the clients to social resources and supports in the community such as housing, education, mentoring, and income assistance. The patients received the supports when they were released that they would not have had otherwise because the diagnosis process is very expensive out of the institution. One of the interviewees stated that, thanks to the interdisciplinary approach, enhanced collaboration among different units, and the support from the FASD Network, the patients received more comprehensive discharge plans in this pilot project than usual regardless of their diagnosis.

One potential negative impact of the process on some of the clients which was mentioned by an interviewee was "assessment burnout" because some assessments take longer than two hours which is not an easy task for the clients who have cognitive disabilities. Another potential negative outcome mentioned was the unpleasant interaction of the clients with their family, especially with their mother (e.g., blaming the mother for prenatal alcohol exposure) after they learned the diagnosis. Finally, the clients might be scared of the potential stigma that will surround them once they are diagnosed.

> *"They might be scared of the stigma that comes around it.… They might not believe that they have FASD. … Or maybe some people are just really open to it, and if they learn more about it, then they're more willing to get it, but… they understand the assessment that comes with it … but yeah, there's so much stigma around FASD as it is, so that's always something to worry about that with individuals."*

Perceived Challenges

The interviews also revealed some challenges commonly experienced by the program staff and stakeholders. The most prevalent challenges were the difficulties in balancing the administrative roles of the staff and the project workload, occasional challenges in information sharing among

different units and communication failures, having a contract (part-time) psychologist instead of a full-time psychologist, having a limited number of occupational therapists, and occasional lockdowns within the institution.

Administrative Roles

According to the Canadian guidelines, the Coordinator of FASD Diagnostic Programs should only coordinate the diagnosis and treatment process. However, in RPC's FASD Program, only 50% of the Coordinator's workload consisted of her core responsibilities in relation to diagnosis and treatment. The remainder of her time was spent on hiring staff, purchasing supplies, ordering psychological assessment tools, and finding rooms to do assessments. The Program Coordinator's involvement in these administrative duties was not anticipated by the project team at the beginning of the program and these duties took a significant amount of the Coordinator's of time. According to one of the interviewees, this was caused by a lack of balance within the institution between the administrative roles and the actual implementation of the project.

> *"The whole project went well, the diagnosing, meeting with the patients, the clinic… That actually was the easy part. It was the administrative part that was tricky, and that's because of the bureaucracy."*

Sharing Information

There were some concerns raised by the staff about a lack of broader information sharing with the project team and stakeholders. The information on the FASD diagnosis of the clients has been included in the OSCAR database upon request by the project Coordinator. The national headquarters (NHQ) of the CSC approved the installment of a FASD dropdown box in the OSCAR system. However, including the medical information of the clients such as FASD diagnosis and assessments in the OMS database, which can be accessed by parole officers, was not welcomed by the healthcare staff. The clinical social workers were concerned about sharing reports with parole officers. One of the staff said, "getting everybody on the same page in terms of information sharing was a challenge." The Coordinator and some other team members thought that the information should be shared with parole officers to let them know how to work with the patients. Another interviewee said that the parole officers should have access the healthcare information including mental health issues in order to fully support the client. In the current process, parole officers are not provided with the full case plan, they can only access the practical information that is entered in the OMS database such as the appointments that were set up for the client.

> *"I think it's a terrible flaw that we don't share the mental health information with the parole officers. … you know, if you have a guy who's got horrible time with appointments and he's missing his appointments, well, they're gonna see that in a different way. They're gonna see it as, you know, being obstinate or disengaging in treatment, when really, it's just, "I have no idea, the value of time management, and I don't know how to get my appointments on time." So, if the parole officer has that information and they're*

> *better armed to work with them, then we would see a lot less suspensions over needless things."*

Another concern about information sharing raised by the staff pertained to the clinic meetings. Some of the tests previously done for the clients, such as cognitive, memory, and executive function tests, were not presented in the clinic meetings.

> *"If there was more consultation from the people that know these patients best, to the psychologist involved in the testing, or more comprehensive interviewing on that end… it had been a concern. Yeah. And access to the file. Like a lot of these fellows and ladies have a lot of testing information on their file, and a lot of previous cognitive testing and memory and executive function tests that didn't make an appearance in the clinic process, that would've been hugely informative."*

Communication Failures

Occasionally, some delays or flaws were seen in the communication among the staff. Before the clinic meeting, all team members should send their portion of the report to the corresponding staff so that the final draft can be created before the meeting. In some cases, there were delays in the delivery of those documents before the meeting and this may have resulted in some information not being included in the final report.

> *"It's ideal to get it prior to the clinic, but if we don't get it until clinic, maybe some aspects of what they have to say are missed in clinic, so therefore it doesn't make the final report. Cause it's easier to sit in your office, have all of these things listed and discussed and planned out… But if you hold onto those details, you go to a meeting or clinic, and you forget to say some of these things, then they're not captured at the final report because you didn't mention them. So if you think of them, send them prior so that it's… A more comprehensive, full report."*

There were also communication failures with the parole services when the patients are released into the community. In one case, the Saskatoon Parole Office did not receive any notice about the release date of a client to their city because the client was originally supposed to be released to a different city. There was no service and sources set up for that client and the client recidivated soon after he was released.

Contract (Part-time) Psychologist

A part-time psychologist external to RPC was contracted to complete the neuropsychological assessments for the FASD Program. A contract psychologist was hired because there were not enough psychologists in the institution at the time when the project began. The psychology department of RPC was supposed to have seven full-time psychologists but there were only two full-time and one half-time in-house psychologists at that time. Therefore, the institution could not contribute to the program with a full-time dedicated psychologist and the project had to hire someone from outside of the institution. Lack of an in-house full-time psychologist created

some challenges for the project. First, the contract psychologist was travelling from Alberta to Saskatoon to conduct assessments and this was a challenge for him. Also, due to some occasional lockdowns, the part-time neuropsychologist who drives from 3.5 hours away had to go back without seeing the client on those occasions, which led to delays in the assessment of the clients. Second, the Program Coordinator and other staff could not share patients' private information on the phone or email with the psychologist. Therefore, ongoing communication with the psychologist could not be achieved while he was out of the institution. Third, the part-time psychologist could not often attend the clinic meetings, therefore, the disagreements on some cases could not be adequately discussed. Fourth, as the psychologist was not an in-house staff, he could not access the educational and health history of the clients. Therefore, he did not have the chance to review the files before he completed the psychological tests. Some of the findings in the tests were not congruent with the history of the clients and this was another challenge that resulted from not having an in-house psychologist.

> *" I think it's going to be really valuable having an in-house psychologist on the team, because I think now the bits and pieces can come a little bit more in order. So there won't be so many kinds of... you know, discrepancies between what's been reported from the psychology testing specifically, compared to everything else. Because it'll be a little bit more holistic, having the whole team involved and having that information come at once. Cause there were a few cases where we were reading the report and it's like "Mmmm. No, that doesn't make any sense at all. That's not how he's done on past testing, that's not how he presents currently, that's not what his history says…" And so I think that was a little bit of a challenge and having in-house psychology I think is going to be great."*

There were also some issues with the contract of the psychologist mentioned by the participants. According to the union rules, contracted psychologists can work only 90 days a year. Consequently, the psychologist had to do some pro bono work to complete the assessments.

Inconsistent Findings and Observations

In some cases, the findings of the psychologist and occupational therapist on the client's performance or the recommendations provided by them were inconsistent. Due to the lack of communication and the fact that the psychologist was part-time staff, some of these inconsistencies could not be adequately discussed according to the staff interviewed. This discrepancy was also recognized by a social worker who stated that the findings in psychological tests such as IQ score did not match what they observed in clients in some cases. One clinical psychologist said that some of the tools used by the neuropsychologist were not comprehensive and only gives a quick screen of the domains tested. However, the comprehensive versions of those tests take too much time. The results of the short version tests on some clients were surprising for some of the in-house staff who knew the clients closely. One concern that a clinical psychologist had for the psychological tests was that some clients might have deliberately tried to be diagnosed in order to receive external incentives (e.g., funding, housing, etc.) If the findings are not clear or there is disagreement on findings, the diagnosis might jeopardize the self-motivation of the clients to pursue other opportunities such as education and employment programs.

> *"Because, if you're gonna go for AISH [Assured Income for the Severely Handicapped], which is the program in Alberta, or here… It's usually… if you qualify for that program, it's a lifetime thing, right? Like, you're on it forever. And so we kind of discourage guys who we feel don't quite need to have that program, because they are capable of working, and they are capable of pursuing educational activities, you know? So that's why… You kind of have to be cautious about that piece because if guys already know if they can get into this program, then… I just worry about it jeopardizing their self-motivation to pursue those other things… if they hadn't received that."*

In fact, the difficulties in selecting the instruments used in psychological testing were brought forward by the participants:

> *"We received funding for the testing material, $10,000 worth of funding to order all of these. Oh, and then that was the hard [part], communicating with different psychologists, "Okay, what do we need to do this?". It was like, opening up a garage and then having five cars that you need pieces for, parts for, and having to order the right one."*

Busy Schedule at Initial Stages

The initial stages of the project were very busy, as project staff were trying to reach the number of patients as planned. There were some cases where the team discussed two patients at the same clinic or had two clinics in one week. Some of the clients were released before the clinic meeting could be scheduled and their clinic meeting was held after they were transferred to another institution. This problem was solved by contacting the institutions to which those clients were transferred and holding the meetings through video or telephone conference with those institutions.

Stigma around Criminal History

The stigma due to the criminal history of the clients obstructed the access of the clients to some social services after they were released from RPC. Some clients were not accepted to mental health housing services because of their criminal history although the program staff explained that the client is treated and supported and they are not high risk for recidivism anymore.

> *"We're obligated to disclose, for example, when we're referring them to a mental health house, that they have a criminal history … so it's a struggle sometimes getting our guys, because they do have sexual offenses or violent offenses, or arson offenses, and explaining to the community, "Yes, this is their history but we've been able to support them and we've got them stabilized on medication and we've got them connected with resources, this is isn't a risk for them anymore"…. Just hearing the word, "Well, no, he had a sexual offense." Negates and closes so many doors, and that's a huge challenge."*

Age Criteria

The lack of agreement among service providers on whether an age criterion exists for the diagnosis of FASD led to challenges in receiving some of the social supports. Some community agencies insist that the diagnosis should have been made before the client turned 18 years of age and refuse providing support if that condition is not met. The agencies' explanation for not accepting the diagnosis is reported by one of the program staff.

> *"How can you prove to me that, say, they make the diagnosis based on some of the global factors, one of them being low IQ. How can you prove to me that that low IQ isn't organic brain damage from drug use, from traumatic brain injury, from huffing, from all of these things… We're not going to spend our funding on a guy who's brain damaged because he's done a bunch of drugs."*

Lack of Resources in the Community

There are long waitlists for some community resources such as housing and psychiatry services. Compounding this issue is that the FASD clients need more specific support than others when they are released. For instance, they need supportive housing where on-site staff can check on them and support them when needed. For one of the clients, the waitlist for supportive housing was 12 months. There was also a long waitlist for the community mental health nurse. At the time of the interview, the waitlist for the nurse was about six months. In addition, the referral to the nurse is made by community psychiatrist and it takes around three weeks for the client to see the psychiatrist after they are released.

> *"So, resources and things like housing, connecting with you know, psychiatry and physical health can be really, really challenging. Waitlists for psychiatry can be quite, quite long in the community. So finding supports that can continue to… Just that continuity of care piece. You know, when you've got guys who have the diagnosis and have mental health, and have been stabilized… Having that continuity of care piece can be very difficult when you can't connect them with a psychiatrist."*

Limited Number of Occupational Therapist

Another challenge experienced by the program was the limited number of Occupational Therapist (OT) positions. At the time the FASD Program was implemented, there was one full–time and one part-time OT at the RPC whereas previously there were eight OTs. As a result of the limited number of staff, OTs could only conduct assessments and provide consultations at the clinic meetings within the pilot project but could not provide institutional interventions. Also, OTs could not assess all the clients involved in the project due to this challenge.

Withdrawal of Parole Officers

An important aspect of the program was developing transition plans and connecting clients with community agencies and services based on those plans. Parole officers have a crucial role in the implementation of the transition stage of the program. Originally, Parole Officers were included as members of the FASD Team to contribute to release and transition processes and case

management. However, after attending the first few meetings the parole officer was withdrawn from the project. It was unclear from the interviews as to why the parole officer was withdrawn.

> *"Unfortunately, they withdrew the parole officer that we thought would do the job well. The presence of the parole officer would have enhanced our work significantly, you know, knowing what the case management story was, knowing where they were being released to, all we could do to enhance and facilitate that, and those were missing."*

Pilot Nature of the Project

The fact that this project is a pilot program and the concerns about whether the project will continue to be funded might have created pressure on the team. The staff tried to satisfy both the corresponding criteria for the project and the requirements of the research process including reaching the sufficient number of participants. There were a few cases where the social worker did not feel comfortable with the diagnosis and thought that there was a willingness to diagnose the client although the case was not very clear because of a lack of maternal confirmation. This was explained further by the social worker:

> *"… Cause when you're attached to research, you're wanting it… you know, you're wanting a certain outcome, probably, sometimes, and so that can kind of take over"*

Lessons Learned by the FASD Team

There are several important lessons learned by the project team which can improve the future stages of the program and inform other similar programs that will be implemented in the future. Based on the analysis of the interviews with the team members and stakeholders, the lessons learned are categorized into three groups: lessons learned about: (1) the functioning of the program; (2) institutional policies; and (3) community connection.

Inclusion of Stakeholders

Several lessons learned related to the inclusion of stakeholders into the program who might have key roles in the diagnosis, treatment, and engagement process of the FASD clients. First, interviewees suggested that parole officers and teachers should be included in the FASD team in future programs as they have crucial roles in the engagement of the patients in their community. Also, community social workers and nurses specifically from the city where the client is released should be invited to the meetings because every community is different and the staff working in those communities will know what kind of supports are available in the community. Other support staff such as speech and language pathologists, program facilitators, human rights or ombudsman person, chaplains, spiritual leaders, and Elders can also be included in the process. The clients can be brought to the cultural ceremonies held by the Indigenous communities if they are interested. Families can also be invited to the meetings by using video or audio conference.

Community agencies such as Mental Health and Addictions, Cognitive Disability Strategy, Housing First, Canadian Mental Health Association, and Acquired Brain Injury were also mentioned by the staff among those who need to be around the table in the FASD project. Three of the interviewed staff mentioned the importance of receiving housing support and life mentorship from the Cognitive Disability Strategy (CDS) for the FASD clients which is a provincial program that aims to provide services to people with cognitive disabilities and their families to address their unmet needs. At times, the CDS has failed to provide services to the patients. For instance, they did not provide housing for a client because he had sexual assault charges, while they did not believe that the nature of another client's disorder met the mandate of their agency. Staff believed that inviting those community agency representatives to the project and letting them become more familiar with what is being done with the clients could potentially eliminate their reservations. Also, it was suggested that, within the parole application of the clients, a request for a mentor from the CDS can be included to ensure the mentor can be assigned in a timely manner. It is very important to assign a mentor for the clients particularly in the first few months when the recidivism risk is high.

One of the participants suggested that the clients should be included in the clinic meetings so that they can have their voice in the decisions that affect their lives. For example, they can say what worked and what did not work to better their lives in their previous experiences, and the team can learn if any recommended intervention was tried previously with them. It was also recommended that one team member be assigned to accompany the client during discharge and Escorted Temporary Absences (ETAs). This person can show the clients how to use public transportation to go to the locations where they have appointments such as the parole office, doctor's office, and community support agencies.

Lessons Learned about Program Implementation

The FASD team members and stakeholders discussed key lessons learned about the implementation of different stages of the FASD Program including psychological instruments and assessments used, inclusion of stakeholders, improvement of communication within the team, staff training and additional programs for patients.

Instruments and Testing

The program team learned some lessons from their experiences with the usage of the instruments, which can inform their implementation in future programs. For instance, it was observed that some clients might have deliberately tried to be diagnosed in order to receive external incentives (e.g., funding, housing, etc.). To prevent the clients' deliberate efforts to be diagnosed in the psychological testing, an additional instrument (e.g., Word Memory Test; Green, 2003) that tests the validity of the performance of the client should be used.

> *"Addition of some kind of effort tool or validity tool, that sort of thing. Cause as clinicians, you know, our ability to gauge someone's effort when doing neuropsychological testing is not great…. Some more tools that can speak specifically to*

> *someone's approach to the testing? So, did somebody actually put forth good effort into this, or are they maybe deliberately trying to come across as impaired?"*

Another important lesson was about the holistic approach towards the ten domains. Although the positive result in three domains is enough to diagnose the patient with FASD, testing them in all ten domains helped the program to develop a comprehensive plan for the clients. It might seem redundant in terms of the diagnosis process to run the rest of the tests; however, the client's score in each domain gives important information to consider in the treatment and release plans.

> *"Because that informs more of what's impacting them in their really day-to-day functions, especially in the institution. Their planning for release, how they're gonna deal with problems when they get out there, and in the institution, and how we can support deficits specific to that executive functioning, because it's so fundamental."*

Finally, it was stated that the actual administration of the instrument can also be developed based on the lessons learned. Due to the cognitive disabilities of the clients, they might not sit in a room for long periods. Breaking the assessment sessions into smaller portions and not having the full assessment in one day might be more appropriate and beneficial.

Program Timing and Inclusivity

Due to the time restriction, the project only targeted the clients who were going to be released within 12 months after the program started. It is suggested for future programs to include all clients in the institution and develop in-house programming and interventions for them. One of the participants stated that one of the reasons why the number of clients involved in the program was less than expected was the inclusion of only those whose sentence would expire within 12 months (based on their Warrant Expiry Date). If the project includes the statutory release cases (those who will serve the final third of their sentence in the community) as well, the clients could be supported during the transition process and their progress could be monitored better.

> *"Why aren't we looking at people who are gonna be hitting their statutory release or their day parole, so then we can see actually how we're supporting them on release? So, I think that might've been another reason why we didn't get as many people through the program."*

Another point brought forward for better delivery of services was the timing of the program for the patients. Because the release dates of the clients involved in the pilot project were very close to the time of the assessment, the team could only develop discharge plans and recommendations for the transition process. Future programs should include interventions and programming for the clients while they are in the institution. Programs for the FASD clients on time management, social relationships, anger management, and understanding the implications of their diagnosis can be provided before they are released. In addition to the psychiatric treatments, non-cognitive based institutional programs can be organized for the patients such as art, wellness, sports, and gardening programs. Such programs should be the part of the treatment plan and can prevent misbehaviour while clients are in the institution.

More Communication and Meetings

It was suggested by the staff that the FASD Team hold meetings more regularly and frequently and share more information on the process and things that need to be done.

> *"I think kind of having that opportunity to come together as a team a little bit more frequently would be nice. Just, even to say, "This is kind of what's going on with the project, this is what we're working on so that we can help and support them" Instead of just, "Okay, we're having a clinic, we're gonna be real, real quick, and in and out we go." I mean, everybody's busy and I get that, but I think having a little bit more information about how things are going and what we can do to support the team as a whole would be really nice."*

Specifically, it was recommended that parole officers be invited to participate in the regular meetings and that the details of the mental health situation and diagnosis of clients be shared with parole officers so that they could be better equipped to support the clients in their daily life. It was also suggested by the participants that if the clinic meetings can be held at a time closer to the psychological and historical assessments, more timely and fresh information could be provided to the team.

Staff Training

Staff training on FASD has a crucial role in reducing the stigma around the disorder and ensuring better support for the clients in correctional services. Participants mentioned that the staff working in RPC should receive more training on the meaning and implications of the FASD diagnosis, the domains of assessments, and the areas of support that the FASD clients need.

> *"Kind of going over the testing a bit more to kind of understand like, how does that apply in you know, their daily life, right? So… if there are deficits, like, what does that actually mean? And I think they are addressing it now, but it just… you know, when they were assessed, and that was kind of it… So, I think seeing how it kind of moves forward with the guys being supported in the community, and how the project will kind of expand from there, will be helpful."*

Lessons Learned about Institutional Policies

The FASD team members and stakeholders also provided some recommendations related to staffing issues and institutional development based on the lessons learned in the pilot project.

Staffing

The majority of the staff interviewed suggested that the FASD support team should consist of dedicated full-time staff which involves a psychiatrist, a psychologist, occupational therapists, a Coordinator, an assistant to the Coordinator, social workers, and nursing staff. It was stated that having full-time and dedicated staff would improve the rapport built with the clients and provide more flexibility in terms of the scheduling of assessments. Having an in-house psychologist on the project team was particularly recommended by most of the interviewees because a full-time

dedicated psychologist is needed to supervise and participate in the administration of the recommendations until the client is released. Also, the psychologist and other team members should be included in the team starting from the initial project meetings and trainings so that the team can be engaged and collaborate more effectively.

Another consideration that arose from the interviews was the high caseload levels of the social workers involved in the FASD Program. Given the crucial role played by social workers to support the transition of clients to the community, more social workers who are dedicated to the transition of the clients need to be hired in future iterations of the program, potentially within a broader institutional policy change towards hiring more social workers.

> *"You need to hire more social workers. Because the biggest piece for these guys is that transition to the community. Within the institution, we have the knowledge and the resources to work with those guys. You have clinicians, you've got psychologists, social workers, nurses… They're doing training with the officers, all of those folks are aware of some of the best practices for how to work with these clients, but the community isn't necessarily there, and those resources aren't necessarily there either."*

Finally, in order to ensure that the project team focuses on the diagnosis and treatment aspects of the project, the administration of the program should be taken care of by administrative staff at RPC (not the Coordinator).

Institutional Developments

Given the increasing prevalence of FASD and the importance of FASD treatment, participants provided some recommendations for institutional developments to enhance the capacity of the CSC to treat patients with FASD. One interviewee suggested the establishment of regional mobile diagnostic teams. Those teams can consist of the frontline staff who are able to diagnose FASD and provide recommendations for treatment and other interventions. The teams can visit each correctional facility in the region for two days and diagnose four individuals in that period. Similar teams were established in other jurisdictions and worked well. The mobile diagnostic team can be based in a central facility in the region and the team can dedicate some of their times to mobile team visits or their visits to the other facilities can be funded by the corresponding institution. Those teams can either complete their assessments as a joint initiative or sequentially. Joint assessments can be done when the team can come together in one facility at a certain time. In the sequential assessment option, each member of the team can complete their part in separate times and their findings can be discussed at the end to reach a final conclusion about the diagnosis.

Another participant suggested that a regional treatment centre can develop a specialized unit for FASD patients and that unit can implement in-depth assessments and treatments for them.

> *"There would be the likelihood of engaging a regional treatment centre as the potential place for more in-depth assessment, more in-depth utilization of the recommendations for the individuals in the system. So that would be… of course, advice is that all of this*

> *should be evaluated from an economic, clinical, and correctional perspective to ensure that it is indeed doing what it said it would do."*

One participant underlined that the prevalence of FASD among forensic patients has been shown in the literature and there are significant developments in the scientific knowledge on the diagnosis and treatment of FASD. The participant stated that not taking the necessary measures to remedy this problem is against the United Nations Charter on People with Disabilities, and therefore, it becomes a human rights issue in addition to the medical aspect. Therefore, the FASD problem should be prioritized in the CSC agenda and more projects should be developed across the country.

Lessons Learned about the Community Connection

Funding for FASD network

The FASD Network supports the program voluntarily and does not receive any external funding for their involvement. If funding can be provided, they can be involved more in the project and help with interventions and treatments for the patients through Escorted Temporary Absences (ETA) which allows the patients to temporarily leave the institution accompanied by one or more escorts. The help that FASD network can provide through the ETAs is explained by one of the participants:

> *"They would need to assign somebody to actually… on the team specifically, to do the discharge. And even, you know, the luxury of doing things like ETAs. Bringing them to the parole office, bringing them to different places in the community so that they can see the places that they need to go beforehand. That's huge for a lot of our people. If you tell them, "Oh, when you get out on your release date, you're going to have to take the bus and go down to Sturdy Stone?" Well, that doesn't mean anything to them if they've never been in the community. And even if they have, a lot of our people have certain deficits that… knowing how to take the bus is difficult. Or… What bus to go on. You have to give them that specific, like, "Maybe let's go out and ride the bus one day to the […?] and see what it's like. So when you're out on your own, it's not as overwhelming." Things like that I think would be really beneficial."*

Also, participants discussed the cost of involving the FASD Network in the pilot project. According to one of the participants, the costs of attending the FASD Program for the FASD Network included the staff wages for the time they spent attending meetings, clients' appointments, and clinics, developing release plans, travelling, and completing paperwork. The total cost per person supported by the FASD Network is estimated by the participant as more than $700, and these costs are covered by the FASD Network's own resources.

Earlier Notice for the Release Date

Participants mentioned the importance of being noticed by the institution about the release date of patients at an earlier stage. Knowing ahead of time where the client will be released is also important with respect to contacting the offices and arranging services available for the client in that community before the client is released. To ensure that release plans are properly created and necessary community resources are arranged for clients upon their release, the discharge planners need to be provided with the reports which includes the assessment findings and recommendations at least three months before the release date. Also, enabling the FASD Network to hold bi-weekly meetings with the client in the early phases of the diagnosis process (preferably at least two months before the release date) would help the Network build rapport with the clients and educate them about the resources available to them in the community.

6. Conclusion

The initial year of the FASD Pilot Program was successfully implemented and generally followed the original diagnosis model which was based on the Canadian Diagnostic Guidelines for FASD. A few adjustments were made to the program design due to some time restrictions, ethical concerns, and participants' needs as observed by the FASD Team. These changes included non-implementation of institutional and transitional recommendations due to the time restrictions, providing treatment recommendations to all patients in the institutions and not limiting them to the program participants due to ethical considerations, inclusion of teachers on the FASD team, and shortening the final medical report to reduce redundancies and improve readability.

Thirty-one out of 34 patients who were approached by the FASD team participated in the program. FASD assessments were completed for 25 participants and FASD screening was completed for 22 patients. The data on the diagnosis process revealed the prevalence of FASD and its symptoms among the participants. Prenatal alcohol exposure (PAE) was confirmed by the mother or a relative of the patient in almost half of the assessed sample (45%). The three sentinel facial features were present in 100% of the FASD with SFF cases (n =3) and absent (0%) for the other diagnosis groups (ND, CN and FASD without SFF). Neurodevelopmental domain impairment was significantly higher for the FASD with SFF group, compared to the ND and CN groups. The screen subsample (n = 22) had a similar pattern of PAE, SFF and neurobehavioural domain impairment to the assessed cases (n = 25).

Among the five different screening tools used in the pilot program to identify persons at high risk for FASD (i.e., BSC-R, LHS, AYS, QFST, and FST), the AYS (86%) and QFST (77%) had the highest FASD accuracy rate. Both the AYS and QFST correctly identified all 10 participants with FASD. However, the AYS incorrectly flagged 3 persons as high risk for FASD, while the QFST incorrectly flagged 5 persons as high risk for FASD. The LHS was more successful at distinguishing between the 3 diagnosis outcome groups and identifying the most CN/FASD cases

(79%). The FST performed better as a CN/FASD screen (80%), but it was still a poor predictor of CN/FASD (correct prediction rate = 68%). Although not promising as an FASD or CN/FASD screen, the FST may prove useful in determining treatment plans, as it identifies many criminogenic risks—criminal history; antisocial personality; pro-criminal attitudes; anti-social/criminal networks; employment instability; family or relationship problems; lack of prosocial recreational activities; and substance use—and participants' strengths.

The FASD Program provided institutional recommendations to prepare the participant for release into the community. The recommendations included diagnosis-specific issues to assist participants in improving their coping skills and life skills, providing cultural/religious services and mental health and addictions support, issues surrounding reintegration preparation, enhancement of the social services provided in the community, and enhanced connection with the parole officers.

The strengths of the program as perceived by the staff and stakeholders were having an interdisciplinary program team which consists of experienced and passionate staff, the success of the program in reaching a sufficient number of clients and obtaining maternal confirmation of alcohol exposure, the evidence-based approach of the program model, the support provided by the RPC and the FASD Network, awareness of the importance of FASD among the stakeholders and staff, providing a diagnosis for the clients, the training sessions held for RPC staff, and the positive effects of the program on the patients.

The challenges of the program as perceived by the program staff and stakeholders were the difficulties in balancing the administrative roles of the staff and the project workload, occasional challenges in information sharing among different units and communication failures, having a contract (part-time) psychologist instead of a full-time psychologist, having limited number of occupational therapists, and occasional lockdowns within the institution.

Based on the findings on the strengths and challenges of the program, we provided some recommendations on program management, staffing, screen tools and instruments, data collection, information sharing and stakeholder engagement. With the incorporation of the recommendations into the program model and policies, the pilot project has the potential to be expanded to other CSC facilities and RTCs.

7. Recommendations

Based on the findings of the evaluation, recommendations are put forward to further support the FASD Pilot Program. The recommendations are about the various aspects of the program including program management, staffing, training, screen tools and instruments used in the program, data entry and collection strategy, information sharing, and stakeholder engagement.

Risk Tools and Expansion to CSC Facilities

The Asante Youth Screen (AYS), which was designed to be completed using secondary health and education data, had the highest overall FASD accuracy rate. As an alternative to expanding the current FASD Program to other Regional Treatment Centres (RTCs), CSC should consider using intake and health data to complete the AYS. Testing 100% of high-risk, 50% of intermediate risk and 5% of low-risk offenders (see: Hall et al., 1996) may be a more fiscally feasible and quicker alternative to testing offenders in TRCs who are within 1-year of community release. Since intermediate and low risks were not defined by the tool developers, our suggestion is to define intermediate risk as one Social Factor or two Personal Factors and low risk no Social factors or less than two Personal Factors.

AYS would be preferred if a tool that rarely misidentifies persons with high FASD risk is needed. However, AYS is less useful in flagging both FASD and CN cases for further testing. In terms of identifying the most CN/FASD cases, the LHS would be the superior screen (Se = 79%). Although not promising as an FASD or CN/FASD screen, the FST may prove useful in determining treatment plans, as it identifies many criminogenic risks—criminal history; antisocial personality; pro-criminal attitudes; anti-social/criminal networks; employment instability; family or relationship problems; lack of prosocial recreational activities; and substance use—and participants' strengths.

Given the poor level of accuracy of the BSC-R in predicting FASD (68%) or FASD and CN (27%), we recommend reconfiguring the BSC-R decision rule using the recent Canadian FASD guidelines and a larger sample. The FASD and ND groups had similar average Key Life History Domains which was driven by a similar pattern of group differences in individual Maternal Alcohol Use and Day-to-Day Behaviour items. Therefore, we recommend interpreting the Key Life History Domains results with caution.

The QFST had a fair level of accuracy as an FASD screen. However, some persons flagged as high-risk were actually ND and the tool was less useful at identifying ND cases. Given that CSC is likely to be more interested in identifying the FASD cases (i.e., Se), and knowing how many persons referred for a costly diagnosis are likely to test positive (i.e., PPV), the QFST (along with the AYS), is a promising tool deserving of further testing and validation efforts. Although the QFST was intended to screen for FASD, the quick score seems promising as a FASD/CN screen. It might be feasible to use differences in the quick score mean and a larger sample to identify cut-points for a CN (e.g., .5 or higher) and FASD diagnosis.

Program Model Clarifications

The program differentiates between diagnosis and treatment staff, and diagnosis is prioritized by the current program delivery model. In the future, a greater emphasis should be placed on treatment, which may be facilitated by diagnosing patients farther in advance of their release date. Specifically, to ensure that transitional treatment recommendations can be implemented (as this did not occur in in the pilot program), program management needs to consider amending the inclusion criteria to inmates eligible for release in 2 years rather than 1 year.

In addition, the program model could be further clarified to reflect the importance of diagnosis and treatment, as well as research-related priorities such as data entry and tracking. For instance,

the goals of the program, as well as its future directions, could be clarified in a staff retreat event and regular meetings. The retreat can be considered as a group activity in which the FASD Team can be broken into smaller groups of 4-5 persons to enable them list program goals, staff roles, and a 5-year plan within the small group. Then the findings of the small group can be discussed together as the whole team.

Lack of Role Clarity

There was a lack of consensus among project team members about the diagnosis process, which staff are supposed to be involved in formulating treatment recommendations, and what happens after patients are released to the community. To eliminate these confusions, a staff retreat should be organized outside of RPC to enable the team to discuss the project design, project goals, and role of each team member. Also, more regular, frequent, and inclusive team meetings are needed to prevent confusion and let the team members know about all steps of the treatment and release process. Specifically, social workers need to be clearly informed on roles, responsibilities, and the scope of the project either by including them in the case conferences or providing a detailed information package to them afterwards. The psychology department should also work more closely with social workers to ensure that the messages from the program team are communicated properly.

Earlier notice about the release date of the patients needs to be given to the project team by the institution to ensure that the required services are made available for the client in the community that they will be released. Further, to allow for the proper implementation of community recommendations, the program needs to ensure that parole officers receive a copy of the recommendations. This can be accomplished by uploading the reports that include the recommendations to the OMS database which can be accessed by the parole officers. Also, to avoid delays and other potential problems after the release of the patients, parole officers should be given timely notice about the release of FASD patients.

Program Data Tracking and Data Entry

Program data tracking needs to be based on the needs of the program (i.e., to measure program effectiveness and efficiency, as well as to respond to changing program needs). Data entry needs to be done either concurrently with diagnosis and treatment, or routinely (e.g., monthly). If the pilot program is expanded to other regional treatment centres (RTCs), a nation-wide method of tracking the program data on FASD needs to be developed and applied across all five RTCs.

Staffing

In the pilot project, the Coordinator's role included administrative responsibilities such as hiring staff, purchasing of supplies, ordering psychological assessment tools, and finding rooms to do assessments. In line with the Canadian FASD guidelines, the Coordinator should only coordinate the diagnosis and treatment process. To help with the administrative duties, an administrative assistant for the Coordinator needs to be hired.

The FASD support team should consist of dedicated full-time staff which involves a psychiatrist, a psychologist, occupational therapists, a Coordinator, an assistant to the Coordinator, social workers, and nursing staff. Specifically, an in-house psychologist needs to be hired by the RPC and included in the project team because a full-time dedicated psychologist is needed to supervise and participate in the administration of the recommendations until the client is released.

Further, RPC staff should receive more training on the meaning and implications of the FASD diagnosis, the domains of assessments, and the areas of support that the FASD clients need.

Participants' Degree of Effort in Assessments

Staff expressed concern about participants not trying to the full extent of their abilities when completing the neuropsychological assessments to obtain a CN or FASD diagnosis to maximize possible financial and other benefits upon community release. Word Memory Test (Green, 2003) can be added to the battery of standardized neuropsychological assessments to avoid participants' efforts not trying to the full extent of their abilities when completing the assessments.

Enhancement of Clinic Meetings

To avoid delays and potential problems in the implementation of the program, better communication among the project team and with the external stakeholders is needed. To this end, team meetings need to be held more regularly and frequently and more information on the process need to be shared with all members of the team.

To enhance the engagement of the stakeholders to the program, the representatives of the agencies who might have key roles in the diagnosis, treatment, and engagement process of the FASD clients need to be included in the clinic meetings. More funding needs to be provided to the community agencies that provide social services for the FASD clients to eliminate the lack of access to those services that might occur when the client released to the community.

Summary of Recommendations

Program Management and Staffing

- The program model needs to be documented in a way that reflects the importance of both diagnosis and treatment.
- FASD support team should consist of dedicated full-time staff which involves a psychiatrist, a psychologist, occupational therapists, a Coordinator, an assistant to the Coordinator, social workers, and nursing staff. Adequate number of staff dedicated to the program implementation needs to be ensured.
- In line with the Canadian FASD guidelines, the Program Coordinator should only coordinate the diagnosis and treatment process. To help with the administrative duties, an administrative assistant for the Coordinator needs to be hired.
- The goals of the program should be clarified in staff retreat activities and regular meetings.
- The staff working in RPC should receive more training on the meaning and implications of the FASD diagnosis, the domains of assessments, and the areas of support that the FASD clients need.

Screening Tools and Instruments

- Given the relatively higher accuracy rates of the AYS and QFST in predicting the FASD diagnosis, we recommend using these tools.
- As the accuracy rates of BSC-R, LHS, and FST are relatively lower, we recommend interpreting their results with caution.
- Word Memory Test (Green, 2003) can be added to the battery of standardized neuropsychological assessments to detect if participants are not trying to the full extent of their abilities when completing the assessments.

Data Collection

- The inclusion criteria need to be amended to allow the inclusion of inmates eligible for release in 2 years (rather than 1 year) to ensure that treatment plans can be implemented while patients are still in RPC.
- Program data tracking should be based on the needs of the program (i.e., to measure program effectiveness and efficiency, as well as to respond to changing program needs).
- Data entry should be done either concurrently with diagnosis and treatment, or routinely (e.g., monthly).
- If the FASD Program is expanded to other regional treatment centres (RTCs), a nation-wide method of tracking the program data on FASD should to be developed and data should be collected consistently across the RTCs.

Information Sharing and Stakeholder Engagement

- To ensure that parole officers can access a copy of recommendations, they should be allowed to access participants' files via OMS and notified about a released inmate with FASD.
- To enhance the engagement of the stakeholders, the representatives of the community agencies who have key roles in the diagnosis, treatment, and engagement process of the FASD clients need to be included in the clinic meetings.
- Earlier notice about the release date of the patients needs to be given to the project team by the institution to ensure that the required services are made available for the client in the community when they are released.

References

Andrews, D. A., & Bonta, J. (2006). *The psychology of criminal conduct* (4th ed.). Newark, NJ: LexisNexis.

Andrews, D. A., & J. Bonta. (2010). Rehabilitating criminal justice policy and practice. *Psychology, Public Policy, and Law*, 16(1), 39–55.

Andrews, D. A., Bonta, J., & Wormith, J. S. (2006). The Recent Past and Near Future of Risk and/or Need Assessment. *Crime & Delinquency*, 52(1), 7–27.

Bell, A., & Trevethan, S. (2004). *Community Residential Facilities in Canada: A Descriptive Profile of Residents and Facilities* (Report No. 2004 N° R-157). Ottawa, ON: Correctional Service Canada. https://www.csc-scc.gc.ca/research/r157-eng.shtml.

Bonta, J., & Andrews, D. A. (2007). *Risk-Need-Responsivity Model for Offender Assessment and Rehabilitation* (User Report 2007-06). Public Safety Canada.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Burden, M. J., Andrew, C., Saint-Amour, D., Meintjes, E., Molteno, C., & Hoyme H. (2009). The effects of fetal alcohol syndrome on response execution and inhibition: An event-related potential study. *Alcoholism: Clinical and Experimental Research,* 33(11), 1994-2004. doi:10.1111/j.1530-0277.2009.01038.x

Burke, A. & Pei, J. (2018). *Risk, Needs, Responsivity: Rethinking FASD in the Criminal Justice System*. In Ian Binnie, Sterling Clarren & Egon Jonsson (eds.), Ethical and Legal Perspectives in Fetal Alcohol Spectrum Disorders: Foundational Issues. Springer Verlag.

Caulfield, J. (September 6, 2019). *How to do thematic analysis*. Retrieved May 7, 2020 from Scribbr website https://www.scribbr.com/methodology/thematic-analysis/.

Chudley, A. E., Kilgour, A. R., Cranston, M., & Edwards, M. (2007). Challenges of diagnosis in fetal alcohol syndrome and fetal alcohol spectrum disorder in the adult. *American Journal of Medical Genetics. Part C, Seminars in Medical Genetics*, *145C*(3), 261–272.

Clarren, S. (2018). *Understanding the Methods for Diagnosing FASD*. In Ian Binnie, Sterling Clarren & Egon Jonsson (eds.), Ethical and Legal Perspectives in Fetal Alcohol Spectrum Disorders: Foundational Issues. Springer Verlag, 69-75.

Cook, J. L., Green, C. R., Lilley, C. M., Anderson, S. M., Baldwin, M. E., Chudley, A. E., Conry, J. L., LeBlanc, N., Loock, C. A., Lutke, J., Mallon, B. F., McFarlane, A. A., Temple, V. K., & Rosales, T. (2016). Fetal alcohol spectrum disorder: A guideline for diagnosis across the lifespan. *CMAJ*, *188*(3), 191–197.

Correctional Service Canada. (2018). *The Integrated Correctional Program Model*. Ottawa, ON: Correctional Service Canada.

Correctional Service Canada. (n.d.). *Community-Based Residential Facilities (CBRFs).* Retrieved from Correctional Service Canada website: https://www.csc-scc.gc.ca/facilities-and-security/001-0001-eng.shtml.

Eagle Urban Transition Centre. (n.d.). *Eagle's Nest Program.* Retrieved from the Eagle Urban Transition Centre website: https://eagleutc.com/services/eagles-nest-program/

Edemekong, P.F., Bomgaars, D.L., Sukumaran S., & Levy, S.B (2020). Activities of Daily Living (ADLs). In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK470404/

El Khouli, R. H., Macura, K. J., Barker, P. B., Habba, M. R., Jacobs, M. A., & Bluemke, D. A. (2009). Relationship of temporal resolution to diagnostic performance for dynamic

contrast enhanced MRI of the breast. *Journal of magnetic resonance imaging: JMRI, 30*(5), 999–1004. DOI: https://doi.org/10.1002/jmri.21947

Fast, D., & Conry, J. (2004). The challenge of fetal alcohol syndrome in the criminal legal system. *Addiction Biology*, *9*(2), 161–166.

Fast D. K., Conry J., & Loock C. A. (1999). Identifying fetal alcohol syndrome among youth in the criminal justice system. *J Dev Behav Pediatr*, 20, 370–2.

Flannigan, K., Pei, J., Stewart, M., & Johnson, A. (2018). Fetal Alcohol Spectrum Disorder and the criminal justice system: A systematic literature review. *International Journal of Law and Psychiatry*, 57, 42–52. https://doi.org/10.1016/j.ijlp.2017.12.008

Fraser, C. (2011). *Fetal Alcohol Spectrum Disorder (FASD): Term Describing Screening, Assessment, and Diagnosis - Research in Brief* -. https://www.justice.gc.ca/eng/rp-pr/jr/rib-reb/fasd-etcaf/index.html

Green, P. (2003). Word Memory Test for Windows: User's manual and program. Edmonton: Green's Publishing.

Hall, K. S., Ogunniyi, A. O., Hendrie, H. C., Osuntokun, B. O., Hui, S. L., Musick, B. S., Rodenberg, C. A., Unverzagt, F. W., Guerje, O., & Baiyewu, O. (1996). A cross-cultural community based study of dementias: Methods and performance of the survey instrument indianapolis, U.S.A., and Ibadan, Nigeria. International Journal of Methods in Psychiatric Research, 6(3), 129-142. https://doi.org/10.1002/(SICI)1234-988X(199610)6:3<129::AID-MPR164>3.3.CO;2-A

Hoyme, H.E., Kalberg, W.O., Elliott, A.J., Blankenship, J., Buckley, D., Marais, A.S., Manning, M.A., Robinson, L.K., Adam, M.P., Abdul-Rahman, O., Jewett, T., Coles, C.D., Chambers, C., Jones, K.L., Adnams, C.M., Shah, P.E., Riley, E.P., Charness, M.E., Warren, K.R., & May, P.A. (2016). Updated Clinical Guidelines for Diagnosing Fetal Alcohol Spectrum Disorders. *Pediatrics, 138* (2). DOI: https://doi.org/10.1542/peds.2015-4256.

Hoyme, H.E., May P.A., Kalberg W.O., Kodituwakku, P., Gossage, J.P., Trujillo, P.M., Buckley, D.G., Miller, J.M., Aragon, A.S., Khaole, N., Viljoen, D.L., Jones, K.L., & Robinson, L.K. (2005). A practical clinical approach to diagnosis of fetal alcohol spectrum disorders: clarification of the 1996 Institute of Medicine criteria. *Pediatrics*, 115(1): 39–47. DOI: https://doi.org/10.1542/peds.2004-0259.

Lange S., Probst C., Gmel G., Rehm J., Burd L., & Popova S. (2017). Global prevalence of fetal alcohol spectrum disorder among children and youth: a systematic review and meta-analysis. *JAMA Pediatr*, *171*, 948–56.

MacPherson P. H., Chudley A. E., & Ba G (2011). *Fetal Alcohol Spectrum Disorder (FASD) in a correctional population: Prevalence, screening and characteristics*. Correctional Service of Canada: Ottawa, ON.

Metz, C.E. (1978). Basic principles of ROC analysis. *Seminars in Nuclear Medicine*, *8*(4), 283–298. DOI: 10.1016/s0001-2998(78)80014-2.

Murphy A., & Chittenden M. (2005). *The McCreary Centre Society. Time Out II: A Profile of BC Youth in Custody*. The McCreary Centre Society: Vancouver, BC.

Native Addictions Council of Manitoba (n.d.). *Programs*. Retrieved from the Native Addictions Council of Manitoba website: http://www.nacm.ca/programs.html

Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (2015). Handbook of Practical Program Evaluation. John Wiley & Sons.

Office of the Correctional Investigator. (2018, June 29). *Annual report of the Office of the Correctional Investigator 2017-2018* (by Ivan Zinger, Correctional Investigator). https://www.oci-bec.gc.ca/cnt/rpt/annrpt/annrpt20172018-eng.aspx#s12

Popova, S., Lange, S., Bekmuradov, D., Mihic, A., & Rehm, J. (2011). Fetal alcohol spectrum disorder prevalence estimates in correctional systems: A systematic literature review. *Canadian Journal of Public Health*, 102(5), 336–340.

Popova S., Lange S., Probst C., Parunashvili N., & Rehm J. (2017). Prevalence of alcohol consumption during pregnancy and fetal alcohol spectrum disorders among the general and aboriginal populations in Canada and the United States. *Eur J Med Genet; 60*, 32–48.

Rojas E. Y., & Gretton H. M. (2007). Background, offence characteristics, and criminal outcomes of aboriginal youth who sexually offend: a closer look at Aboriginal youth intervention needs. *Sex Abuse*, *19*, 257–83.

Stemler, S. (2000). An overview of content analysis. *Practical Assessment, Research, and Evaluation*, 7: Article 17. DOI: https://doi.org/10.7275/z6fm-2e34.

The Mustard Seed. (n.d.). About Us. Retrieved from the Mustard Seed website: https://theseed.ca/about-us/

Trevethan R (2017) Sensitivity, Specificity, and Predictive Values: Foundations, Pliabilities, and Pitfalls in Research and Practice. *Front. Public Health*, 5:307. DOI: 10.3389/fpubh.2017.00307

Appendices

Appendix A. Ethics Approval Notice

UNIVERSITY OF SASKATCHEWAN

Biomedical Research Ethics Board (Bio-REB)

Certificate of Approval

PRINCIPAL INVESTIGATOR	DEPARTMENT	Bio ID
Mansfield Mela	Psychiatry	367

INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT
Regional Psychiatric Centre
2520 Central Avenue North
Saskatoon SK S7K 3X5

SPONSOR(S)
Correctional Service of Canada (CSC)

TITLE
Assessing Neurodevelopmental Disorders and Neurocognitive Deficits among Offenders in the Regional Psychiatric Center

ORIGINAL REVIEW DATE	APPROVED ON	APPROVAL OF	EXPIRY DATE
11-Sep-2018	14-Nov-2018	Patient Consent Form, rec'd 09-Nov-2018, Appendix L Staff Participant Consent Form, rec'd 09-Nov-2018, Appendix M FASD Pilot Project Interview Guide: FASD Staff, Appendix N Staff Participant Information Letter, rec'd 09-Nov-2018, Appendix O Staff Transcript Release Form, rec'd 09-Nov-2018, Appendix P Notice of Ethical Review, responses rec'd 09-Nov-2018 Biomedical Application-Secondary Use of Health Data, rec'd 09-Nov-2018 Acknowledgement of Appendix items: A: Correctional Service Canada, Consent to Participate In/Receive Health Services B: Correctional Service Canada, Consent for Release of Information C: Fetal Alcohol Spectrum Disorder Diagnosis Clinic Application Form D: Correctional Service Canada, Fetal Alcohol Spectrum Disorder Brief Screen Checklist, Participant E: Life History Screen F: Brief Screening Index G: Asante Centre, Youth Probation Officer's Guide to FASD Screening and Referral H: Fetal Alcohol Spectrum Disorders Functional Screening Tool I: Medical and Neurodevelopment Assessment Form J: Medical Summary Report K: Recommended Treatment Domains	13-Nov-2019

Delegated Review ☒ Full Board Meeting ☐

IRB 1 Registration #00001471 ☐ IRB 2 Registration #00008358 ☐ Not Applicable ☒

CERTIFICATION
The University of Saskatchewan Biomedical Research Ethics Board (Bio-REB) has reviewed the above-named research study. The study was found to be acceptable on scientific and ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research study, and for ensuring that the authorized research is carried out according to governing law. This approval is valid for the specified period provided there is no change to the approved protocol or consent process.

FIRST TIME REVIEW AND CONTINUING APPROVAL
The University of Saskatchewan Biomedical Research Ethics Board reviews above minimal studies at a full-board (face-to-face) meeting. If a protocol has been reviewed at a full board meeting, a subsequent study of the same protocol may be reviewed through

Please send all correspondence to:
Research Services and Ethics Office
University of Saskatchewan
Room 223 Thorvaldson Building
110 Science Place
Saskatoon, SK Canada S7N 5C9

PRINCIPAL INVESTIGATOR	DEPARTMENT	Bio ID
Mansfield Mela	Psychiatry	367

the delegated review process. Any research classified as minimal risk is reviewed through the delegated (subcommittee) review process. The initial Certificate of Approval includes the approval period the REB has assigned to a study. The Status Report form must be submitted within one month prior to the assigned expiry date. The researcher shall indicate to the REB any specific requirements of the sponsoring organizations (e.g. requirement for full-board review and approval) for the continuing review process deemed necessary for that project. For more information visit http://research.usask.ca/for-researchers/ethics/index.php.

REB ATTESTATION

In respect to clinical trials, the University of Saskatchewan Research Ethics Board complies with the membership requirements for Research Ethics Boards defined in Part 4 of the Natural Health Products Regulations and Part C Division 5 of the Food and Drug Regulations and carries out its functions in a manner consistent with Good Clinical Practices. Members of the Bio-REB who are named as investigators, do not participate in the discussion related to, nor vote on such studies when presented to the Bio-REB. This approval and the views of this REB have been documented in writing. The University of Saskatchewan Biomedical Research Ethics Board is constituted and operates in accordance with the current version of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS 2 2014).

Digitally Approved by Gordon McKay, Ph.D.,
Chair, Biomedical Research Ethics Board
University of Saskatchewan

Appendix B. Staff and Stakeholder Consent Form

FASD Pilot Project Interview Consent Form

You are invited to participate in the University of Saskatchewan's evaluation of the Regional Psychiatric Centre's Fetal Alcohol Spectrum Disorder (FASD) Pilot Project. Please keep this consent form for future reference.

Researchers:

Ashmini Kerodal, PhD
Ashmini.Kerodal@csc-scc.gc.ca
Ashmini.Kerodal@usask.ca
306-966-6275

Lisa Jewell, PhD (PI)
Lisa.Jewell@usask.ca
306-966-2707

What is the purpose of this project?

The purpose of this evaluation is to examine the implementation of the first year of the Fetal Alcohol Spectrum Disorder (FASD) pilot program.

Procedures:

You are being invited to a 60-minute interview about your experiences with the FASD Pilot Program. Specifically, you will be asked about:

1) the program model to diagnose FASD in the Regional Psychiatric Centre's (RPC) inmate population;
2) what worked well in implementing the program;
3) barriers or obstacles faced in implementing the pilot program;
4) the FASD Pilot Program's overall strengths, challenges, and areas of improvement; and
5) lessons learned from the pilot program to facilitate implementation at other Correctional Service of Canada (CSC) facilities.

Your participation is voluntary and you can choose not to participate in the evaluation. If you wish to participate, you will be asked to sign this form. If you do decide to take part in this study, you are still free to withdraw at any time and without giving any reasons for your decision. If you do not wish to participate, your employment will not be affected.

Please take time to read the following information carefully. You can ask the evaluator to explain any words or information that you do not clearly understand. You may ask as many questions as you need.

Who is funding this study?

The Centre for Forensic Behavioural Science and Justice Studies, University of Saskatchewan.

What are the potential risks and benefits of my participation?
There are no known or anticipated risks to you by participating in this evaluation. Participation in this study is completely voluntary and participants have the right to withdraw at any time. All information received will be kept completely confidential. You will not be identified by name in any reports or publications that result from this evaluation. However, due to the small number of people being interviewed for this study, there is a chance you could be indirectly identified because of the unique information or perspective you provide.

As a result of your participation, you will contribute to understanding how FASD diagnosis occurs in an institutional setting and ultimately improving the program to more effectively meet the needs of participants with FASD. In addition, the lessons learned from this evaluation may be applied to future roll-outs of the FASD diagnosis program in the RPC and/or other CSC facilities.

Right to withdraw
You may withdraw from the research project for any reason, at any time, without explanation or penalty of any sort. Your decision to participate (or not participate) will have no effect on your employment at the RPC. Should you wish to withdraw, we will terminate the interview and discard all previously obtained information. Your right to withdraw data from the study will apply until August 30, 2019.

If you want to withdraw after you have completed the interview, please contact Dr. Ashmini Kerodal at 306-966-6275, or Dr. Lisa Jewell at 306-966-2707.

How will my data be kept confidential?
No personal identifying information will be linked to you or any other evaluation participant. All information gained from this evaluation, including your transcribed interview, will be held confidentially by the Evaluators. Data will be stored securely at the University of Saskatchewan in either a locked filing cabinet or on a secure network drive. Data will be stored for five years; at that time, it will be destroyed. Only overall results, rather than individual data, will be included in any technical reports, fact sheets, presentations, and journal articles used to disseminate the findings.

How will my data be used?
The researchers will prepare a report, which will be given to RPC and Correctional Service of Canada and posted on the Forensic Centre's website. The researchers may also present the findings at conferences and publish the findings in peer-reviewed journals. No names will be included in the report.

How can I get a copy of the results?
If you are interested in the results of this study, please see the Centre for Forensic Behavioural Sciences and Justice Studies website (www.usask.ca/cfbsjs/) where a copy of the report will be posted or contact the Forensic Centre directly at forensic.centre@usask.ca.

If you have any questions, please contact:

- Dr. Ashmini Kerodal, ashmini.kerodal@csc-scc.gc.ca; ashmini.kerodal@usask.ca; (306) 966-6275.
- Dr. Lisa Jewell, lisa.jewell@usask.ca; (306) 966-2707.

- This research project has been approved on ethical grounds by the University of Saskatchewan Research Ethics Board. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office at ethics.office@usask.ca or (306) 966-2975. Out of town participants may call toll free at (888) 966-2975

Consent to Join this Study

- I have read this form and understand what this study is about.
- I was allowed to ask questions about this study and I don't have any more questions about what I am being asked to do.
- I understand the purpose, risks and benefits of the study.
- I have a copy of this consent form for my records.
- I know that I can join the study now and still decide not to participate any time before August 30, 2019.
- I understand that refusal to take part in this study or withdraw at a future date will not affect my employment.
- I understand that only information I consent to share will be included in the study.

☐ **Yes**, I want to be in this study. ☐ **No,** I don't want to be in this study.

Please put a check mark next to the statements you want to say YES to:

☐ I give consent to participate in the interview.
☐ I give the researchers permission to audio-record the interview.
☐ I would like to review a copy of my interview transcript.

Signatures

_____	_____	_____
Participant name (Print)	Participant name (Signature)	YY/MM/DD
_____	_____	_____
Evaluator (Print)	Evaluator (Signature)	YY/MM/DD

Appendix C. Interview Guide

FASD Pilot Project Interview Guide – Staff and Stakeholders

1. Please tell me a little bit about your role in FASD Pilot Program.

For persons involved in diagnosis; skip for interventions staff.

2. What was the FASD diagnosis process used in first year of pilot program?

a. What was the average time to complete each phase?
b. What elements of the pilot process worked well?
c. What elements were easiest to implement?
d. What elements were the most difficult to implement?
e. What issues/barriers/challenges did you face?

Probe: Consider the program model
i. screener
ii. assessment
iii. treatment recommendations

3. Was this different from the original diagnosis process outlined at the start of the FASD Pilot Program?
    a. What changes had to be implemented in practice?
        iv. Were these changes effective?
        v. What were the reasons for introducing those changes?
        vi. How did they make your job easier?
        vii. How did they make your job more difficult?

<u>For persons involved in interventions staff.</u>

4. Have you had any cases where the FASD diagnosis (by the medical history, neuropsychologist, and psychiatrist) presented in the clinic differed from your knowledge of the patient?
    a. Please give an example
    b. How was this resolved?

5. What do you believe has been the impact of the FASD Pilot Project on patients?
    a. What positive impacts do you think patients experienced?
    b. What are the negative impacts you think patients experienced?

6. How has the FASD Pilot Program prepared assessed patients for discharge, if at all?
    b. After release, how do you think the FASD assessment and recommendations will impact patients in the community?

7. Overall, what are the strengths of the FASD Pilot Program? What are the program's challenges or limitations? How can the program be improved? <u>[skip is answered previously for question 2 or 3]</u>

8. Were the same FASD team members involved throughout the pilot project?
    a. What led to these changes in the team's composition?

9. What was it like to work on this interdisciplinary team?
    a. Are all disciplines adequately utilized?

   b. Were any staff underutilized? Can you give me an example?
   c. What disciplines/stakeholders should be added to the team, in your opinion?

10. What advice would you give to decision makers if the FASD Pilot Program was expanded to other organizations or communities in the future?
    a. For the team structure? E.g., internal vs. external staff?
    b. For the diagnosis process?
    c. For the treatment and recommendation process?

11. What should I have asked you that I didn't think to ask?

12. Is there anything else that you would like to share about the FASD Pilot Program that you think is important for me to know?

Appendix D: Evaluation Matrix

Evaluation Matrix

Evaluation Goal (EG)	Evaluation Question	Data Source	Analysis Strategy
1. Identify the FASD diagnosis model (presented in Chapter 3)	• What is the FASD Diagnosis Process? • What are the decision points at each step in the process? • What data is captured at each step in the process?	• FASD diagnosis and screen publications • Program documents • FASD Team interviews	• Literature review • Document review • Content analysis
2. Determine the FASD prevalence rate at RPC (presented in Chapter 4)	• Using a 1-year cohort of RPC patients scheduled for release between July 1, 2018 and June 30, 2019, what is the extent of FASD in RPC? a. What is the PAE, SFF and neurobehavioural domain impairment rate of assessed participants? b. Do PAE, SFF and neurobehavioural domain impairment rates differ by diagnosis outcomes? • Which FASD screen was the most accurate at predicting FASD diagnosis?	• Secondary program data (participants' psychological assessment, medical measurement, diagnosis data) • Secondary program data (participants' screen data: BSC, LHS, AYS, QFST, FST, BSI)	• Chi-square statistics for categorical variables; *F* statistic and Bonferroni post-hoc for continuous variables. Welsh *F* and Games-Howell post-hoc reported when the equal variances assumption of the *F* test is violated. • SPSS version 26 • PPV, NPV, Se, Sp
3. Assess the FASD Program team's treatment recommendations (also presented in Chapter 4)	• What institutional, transitional, and community treatments did the FASD Program recommend for assessed participants?	• Secondary program data (participants final medical reports)	• Content analysis to quantify occurrence of recommendation types and identify themes and subthemes

		• How did treatment recommendations differ by diagnosis outcomes? • To what extent were the FASD Program recommendations implemented?		
4.	Develop a program model to implement at other CSC facilities (presented in Chapter 5 and 6)	• What are the strengths of the program? • What lessons did the FASD Team learn from the first year of operations? • How can the diagnostic process be improved? • How can the program model be improved?	• FASD Team interviews • Publications on best practices in program development and implementation	• Thematic analysis (themes and subthemes/codes using emergent coding) • Literature review

Appendix E. Participant Consent Forms

Correctional Service Canada | Service correctionnel Canada

PROTECTED B ONCE COMPLETED

NOTE: Reference documents: Integrated Mental Health Guidelines

PERSONAL INFORMATION BANK

PUT AWAY ON FILE ▶ Offender HC file or Offender PY File (Section 6)

FPS Number ▶

Family name ▶

Given name(s) ▶

Date of birth ▶

CONSENT TO PARTICIPATE IN/RECEIVE HEALTH SERVICES

Institution/Parole Office	Region

Completing Operational Unit

- ☐ Institutional Mental Health Services
- ☐ Community Mental Health Services
- ☐ Medical/Dental
- ☐ Clinical Discharge Planning Services
- ☐ Other FASD Pilot Project

Please specify the service being consented to in the space below:

I understand that my participation in this service is voluntary and that I am free to withdraw at any time. I have been provided with a full explanation of the service, including the potential risks and benefits of participating, the potential risks of refusing treatment, and any alternatives to the service. I understand that my personal health information will be stored in an electronic medical record and that health services staff will have access to this record. Confidentiality regarding my personal health information will normally be maintained by my health services team, which includes both mental health and physical health care staff. However, health care professionals must disclose information when there is a legal requirement. For example, health care professionals are required to disclose certain types of information, including:

a) Information relevant for release decision-making or supervision purposes.

b) Information suggesting a risk of imminent danger to myself or to another person.

c) Information that a child is, or may be, at risk and in need of protection.

d) Information concerning any activity that may breach security.

e) New information disclosed about offences, if relevant to any of the above.

Other limits to confidentiality specific to this service have been explained to me by the health care professional.

- ☐ I understand and give my voluntary consent to participate in/receive the service.
- ☐ I understand and do not consent to participate in/receive the service.

▶ _____ _____

Signature of Offender/Substitute Decision Maker — Date (YYYY-MM-DD)

_____ ▶ _____ _____

Witness (print name) — Witness Signature — Date (YYYY-MM-DD)

CSC/SCC 4000-18e (R-2016-08) (Word Version) (Voir le formulaire CSC/SCC 4000-18f pour la version française)

Personal information will be protected under the provisions of the *Privacy Act* and will be stored in Personal Information Banks CSC PPU 60 and CSC PPU 70.

Distribution

Original = Offender HC file or Offender PY File (Section 6)

Correctional Service Canada | Service correctionnel Canada

Regional Psychiatric Centre (Prairies)
Centre Psychiatrique Régional (Prairies)

Consent for Release of Information

Patient Name
Nom patient: .....

FPS No.
N° S.E.D.: .....

This consent must be signed by the patient prior to releasing or obtaining information about him.
La présente formule doit être signée par le patient avant que l'on ne divulgue ou n'obtienne des renseignements à sons sujet.

I, the undersigned
Je, soussigné .....
(name in full / nom complet)

hereby authorize the Regional Psychiatric Centre (Prairies) Saskatoon, to release to , or receive from: (please initial);
autorise par les présentes le Centre Psychistrique Régional (Prairies)

.....
(name and address of institution, agency, specific person)
*(nom et adresse de l'*établissement, de l'organisme ou du particulier)

specific information from the clinical/medical record, e.g. psychiatric and psychological reports and discharge summaries.
des renseignements précis tirés de mon dossier clinique/médical (c.-à-d. rapports psychiatriques et psychologiques, résumés de lhospitalisation).

This consent is given for a period of six months from the date hereof:
Le consentement est valide pour une période de six mois à partir de la date suivante:

Date: .....

Signature: .....

Witness / *Témoin*: .....

Appendix F. Screen Accuracy Computation

				ACCURACY VALUE	COMPUTATION
	FASD	no FASD	Total	Se	[a/(a+c)] * 100
High risk	a	b	a+b	Sp	[d/(b+d)] * 100
Low risk	c	d	c+d	PPV	[a/(a+b)] * 100
Total	a+c	b+d	a+c+b+d	NPV	[d/(c+d)] * 100
				Overall Correct	[(a + d) / (a+c+b+d) * 100

FASD WORKSHEET				ACCURACY VALUE	COMPUTATION
BSC	FASD	no FASD	Total	Se	40%
High risk	4	1	5	Sp	92%
Low risk	6	11	17	PPV	80%
Total	10	12	22	NPV	65%
				Overall Correct	68%
LHS	FASD	no FASD	Total	Se	90%
High risk	9	9	18	Sp	25%
Low risk	1	3	4	PPV	50%
Total	10	12	22	NPV	75%
				Overall Correct	55%
AYS	FASD	no FASD	Total	Se	100%
High risk	10	3	13	Sp	75%
Low risk	0	9	9	PPV	77%
Total	10	12	22	NPV	100%
				Overall Correct	86%
QFT	FASD	no FASD	Total	Se	100%
High risk	10	5	15	Sp	58%
Low risk	0	7	7	PPV	67%
Total	10	12	22	NPV	100%
				Overall Correct	77%
FST	FASD	no FASD	Total	Se	80%
High risk	8	8	16	Sp	33%
Low risk	2	4	6	PPV	50%
Total	10	12	22	NPV	67%
				Overall Correct	55%

FASD & Complex Needs (CN) WORKSHEET				ACCURACY VALUE	COMPUTATION
BSC	FASD/CN	ND	Total	Se	21%
High risk	4	1	5	Sp	67%
Low risk	15	2	17	PPV	80%
Total	19	3	22	NPV	12%
				Overall Correct	27%
LHS	FASD/CN	ND	Total	Se	79%
High risk	15	3	18	Sp	0%
Low risk	4	0	4	PPV	83%
Total	19	3	22	NPV	0%
				Overall Correct	68%
AYS	FASD/CN	ND	Total	Se	68%
High risk	13	0	13	Sp	100%
Low risk	6	3	9	PPV	100%
Total	19	3	22	NPV	33%
				Overall Correct	73%
QFT	FASD/CN	ND	Total	Se	74%
High risk	14	1	15	Sp	67%
Low risk	5	2	7	PPV	93%
Total	19	3	22	NPV	29%
				Overall Correct	73%
FST	FASD/CN	ND	Total	Se	74%
High risk	14	2	16	Sp	33%
Low risk	5	1	6	PPV	88%
Total	19	3	22	NPV	17%
				Overall Correct	68%

Appendix G. Recommended Treatment Domains

INSTITUION

1. Psychoeducation
2. Safety steps in institution
3. Psychiatric, medications and psychological approaches to understanding program material, type of schooling and work
4. Physical exercise program
5. Inform appropriate staff of FASD best practice
6. Occupational therapy recommendations or referrals

TRANSITION

1. Financial support application
2. Guardianship, trustee and benefits administration
3. Self-notification to police and parole officer
4. Obtain passport from network
5. Social work – types of connections with family and financial support
6. General Practitioner examination and blood work – hormones re SOP

COMMUNITY

1. Housing type – supported
2. Mental health and addiction support in community
3. Strategy for compliance
4. Offense specific recommendations
5. Community case management and support services
6. Behaviour management strategy and relationships
7. Source of mentorship and type of supervision
8. Self-help group and social skills training
9. Neuropsychologist recommendations regarding deficit
10. Employment, extracurricular, cultural, religious, spirituality, recreation and community program recommendations

Appendix H. Treatment Recommendations: Themes and Subthemes

Institutional Recommendations

Functioning

1. Diagnosis specific
    - Advice for staff (e.g., Medical algorithm, best practices)
    - Advice/information for community workers (e.g., FASD Medical algorithm, FASD best practices)
    - FASD community support (referral, assessment, mentorship)
    - Psychoeducation
    - Cognitive/FASD/Coping skills
        - Emotion regulation (exercise, art)
        - Self-harm regulation
        - Self-regulation techniques (bean bag?)
        - Role playing
        - Anger/mood management
        - Structured daily routine w/ exercise & hygiene
        - Advice for staff workers
    - Life skills
        - Time management
        - Reminders (e.g., calendar, cell phone, clock)
        - Money management
        - Problem solving
        - Hygiene
        - Transportation

Spiritual, Mental and Primary Health

2. Cultural/religious services
    - Grief counselling
3. Mental health (MH) and addictions support
    - Addictions (includes AA, NA)
    - Counselling
    - Psychiatrist/medicine prescription
    - Treatment programs
    - Advice for staff
    - Advice/education (including advice on compliance)
4. Health
    - Compliance
    - Advice/education (e.g., diet, exercise, reproductive health)
    - Referral/Testing

Release Preparation

5. Reintegration preparation
    - Work/skills/educational training (e.g., National Employment Skills Program (NESP); on or off unit employment; Learning Resource Centre (LRC) education upgrade)
    - Employment
    - Anti-gang support
    - Mentorship
    - Group home
6. Programming
    - Other programming (not Mental Health/addictions) compliance/continue
    - Other programming (not Mental Health/addictions) new recommendation

Community Recommendations

Functioning

7. Identification
    - Birth certificate
    - SIN
    - Status card
8. Housing
    - Transitional housing (e.g., halfway house, emergency shelter – Osbourne, Dorchester House)
    - Social housing (e.g., low income)
    - Semi-independent living
    - Supportive housing (e.g., senior's homes, care homes, assisted living)
    - Reserve
    - Housing assistance
    - Community living
9. Safety
    - Travel with staff to community
    - Police perception training/education
    - Safety education RPC/community
    - Advice to community staff

Financial Stability

10. Financial/disability benefits
    - Application
    - Appointment
    - Disability benefits (e.g., Saskatchewan Community Living Service Delivery (CLSD); Community Living Supports)
    - Trustee/guardianship
11. Employment
    - Supported employment
    - Volunteer opportunities
    - Training/education

- Mentorship/advice
- Agencies
- Reference letter

Spiritual, Mental and Primary Health

12. Community cultural services/supports
    - Appointment/Contact information
    - Church
    - Advice to patient
13. Community Mental Health and addictions services/supports
    - FASD community support
    - Cognitive supports/services (e.g., disabilities/non-FASD)
    - AA & other addictions programming
    - Psychiatric (e.g., diagnosis, treatment, medications, wrap-around services)
    - Wrap around services (e.g., Forensic Assertive Community Team (FACT), Assertive Community Treatment Teams (ACTT), Forensic Assessment Community Services (FACS))
    - Counselling (e.g., anger management, domestic violence, sex offender, cognitive/FASD/coping skills)
    - Circles of Support and Accountability (CoSA) support
    - Psychoeducation
    - Group program
    - Culturally appropriate
    - Mentorship
    - Appointment/referral/Contact information
    - Advice for community workers
    - Advice to patient
    - Family/caregiver support/training
14. Primary Health Service/Supports
    - Health card
    - Primary care and dental
    - Chronic illnesses care
    - Occupation Therapy/Physical Therapy
    - Medical benefits (e.g., medication prescription)
    - Medication management/administration (e.g., outpatient clinic, support worker)
    - Education/advice (e.g., hobbies, diet, exercise, reproductive health)
    - Testing
    - Advice for community workers
    - Appointment/referral/Contact information
    - Compliance recommendations

Re-Integration

15. Family reunification
    - Contact information
    - Reunification support

16. Community supports/service (excludes cultural supports, health and MH/Addictions)
    - Case management
    - Counselling (e.g., life skills)
    - Re-integration
    - Anti-gang support
    - Programming
    - Mentorship
    - Leisure activities (includes YMCA)
    - Library programs
    - Culturally appropriate community supports (e.g. CSC's Indigenous reintegration program)
    - Education/Advice to patient
    - Advice/information for community workers (includes assessment, diagnosis, best practices)
    - Community worker training
    - Family/caregiver support
    - Family/caregiver education/training
17. Parole Officer Contact
    - Pre-release contact & planning
    - Contact information
    - Patient information/passport for Parole Officer or police
    - Advice for Parole Officer
    - Indigenous liaison officer/support