

# FETAL ALCOHOL SPECTRUM DISORDER IN THE CORRECTIONS SYSTEM: POTENTIAL SCREENING STRATEGIES

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## ABSTRACT

### **Background**

Fetal alcohol syndrome (FAS) is a leading cause of intellectual deficits, behavioral disorders, impairment and neurological abnormality. Co-morbid mental illness is present in over 90% of patients with FAS. Previous research has demonstrated that people with FAS have frequent contact with corrections systems. However, the disorder is largely unrecognized in corrections systems.

### **Objectives**

We present a rationale for FAS screening in corrections systems and potential screening strategies.

### **Methods**

Four screening strategies are presented. The four strategies A through D are incremental. Strategy A is an easy to implement, low cost strategy to identify offenders considered to be of high risk for FAS by staff discussion and review. Strategy D is a resource intensive population based screening strategy to screen an entire prison or population of offenders.

### **Conclusions**

We conclude that FAS may be common in the corrections system and that a high degree of suspicion for the disorder is warranted. We propose further research on development and epidemiological evaluation of screening tools and strategies for screening in the corrections system.

## INTRODUCTION

In the United States, about 13% of fetuses (520,000 annually) are exposed to alcohol during pregnancy, most at very low levels and only early in pregnancy.<sup>1</sup> However, about 3 to 5% of women continue to drink throughout pregnancy and many drink heavily, more than 5 drinks per occasion and often several times per week.<sup>1</sup> Many of these women also smoke heavily.<sup>2,3</sup>

Fetal Alcohol Syndrome (FAS) is the end result of a complex causal chain which, in addition to prenatal alcohol exposure, nearly always includes maternal smoking, poor diet, limited prenatal care and adverse psychosocial circumstances.<sup>4,5</sup> Burd et al have developed a model of FAS as an exposure plus syndrome

where alcohol is a necessary but usually not sufficient cause for the pattern of impairment of FAS.<sup>5</sup> Revised diagnostic criteria for FAS and partial forms of the syndrome have been proposed.<sup>2</sup> In this paper we utilize the term Fetal Alcohol Spectrum Disorder (FASD) to refer to the range of adverse outcomes from prenatal alcohol exposure. These include FAS, partial fetal alcohol syndrome, and alcohol related neurodevelopmental disorder (ARND).

FAS and the less complete manifestations of the disorder have a prevalence rate from 0.33 per 1,000 to 9.1 per 1,000 population.<sup>3,6</sup> The mortality rate is 6%, and the *all-cause* mortality rate in siblings of children with FAS is increased 530% compared to controls.<sup>7,8</sup> Facial features and growth impairment are important features in the diagnosis of FAS and partial FAS. In alcohol related neurodevelopmental

disorder (ARND), neurological and behavioral impairment determine the severity of impairment in the majority of cases.<sup>2,8,9</sup>

The annual cost of care for persons with FAS has been estimated to be about five billion dollars in the United States. Two studies have found lifetime costs of care to be \$1.4 to \$1.6 million per diagnosed case.<sup>5</sup> Identification of FAS and FASD is an important public health issue since the risk of impairment in each subsequent pregnancy is likely to increase, resulting in families of affected persons. If the mother of a previously affected child continues to drink during subsequent pregnancies, the risk for FASD in subsequent siblings is markedly increased, and approaches 75 to 80%. As a result, it is unusual for younger siblings not to have FASD if the mothers continue to drink.<sup>10</sup> The recurrence risk is one of the most important issues in the need to develop widely available diagnostic clinics and to link them with both chemical dependency treatment services and public health services.

Often the child's experience in the biologic home after birth is one of high anxiety and frequent abuse and pervasive neglect. Early recognition appears to be associated with improvement in behavior and lack of recognition appears to be independently associated with increased rates of secondary disabilities.<sup>9</sup> However, diagnosis at adolescence or adulthood may also have benefits from improved understanding of the degree and type of neurobehavioral impairments present in the offender. This information may enhance program development and provide data that could alter sentencing programming or probation plans for offenders. This may improve the "fit" of programs to the unique pattern of impairments identified by assessment of people with FASD. This may maximize the ability of the affected offender to benefit from drug and alcohol interventions, vocational training, and understanding the conditions of probation.

In Table 1 the risk and protective factors for development of secondary disabilities is presented. In a follow-up of a large cohort of adolescents and adults with FAS and FAE over

90% had contact with law enforcement agencies.<sup>9</sup>

**Table 1: Secondary Disabilities in 400 Adolescents and Adults with Fetal Alcohol Syndrome and Fetal Alcohol Effect (from Streissguth et al 1996)**

1. Mental health problems: 90%
2. Disrupted school experience (suspended or expelled from school or dropping out of school): 60%
3. Trouble with the law: 60%
4. Confinement: includes inpatient treatment for mental health problems, alcohol/drug problems, or incarcerated for a crime: 50%
5. Inappropriate sexual behavior: 50%
6. Alcohol/drug problems: 30%

**Protective Factors**

1. Living in a stable and nurturant home for over 72% of life.
2. Being diagnosed before the age of 6 years.
3. Never having experienced violence against oneself.
4. Staying in each living situation for an average of more than 2.8 years.
5. Experiencing a good quality home from age 8 to 12 years.
6. Having applied and been found eligible for Division of Developmental Disabilities services.
7. Having a diagnosis of FAS.
8. Basic needs met for at least 13% of life.

Several reports have suggested that FASD is more common in corrections systems than in the general population.<sup>9,11</sup> The number of affected people in the criminal justice system is thought to be high.<sup>11</sup> However, the only published prevalence estimate in a corrections population was developed in a juvenile justice system from British Columbia. In this atypical population of adolescents referred for education at a forensic facility, the prevalence of FAS and FAE combined was 24%.<sup>12,13</sup>

A recent survey of corrections systems in the United States and Canada found only one identified case in a population of 3.08 million offenders in the US corrections system.<sup>14</sup> A similar survey found 13 reported cases in a population of 148,797 offenders in the Canadian corrections system.<sup>15</sup> If the prevalence of FAS and ARND in corrections systems is equivalent to the rates in the general population, the number of affected offenders in the

Canadian corrections system would range from 49 (conservative estimate) to 1,345 (high end estimates) and 1,540 (conservative estimate) to 28,036 (high end estimate) in the US corrections system.<sup>15</sup> Nearly all of these subjects may be undiagnosed.

Addressing this problem in the corrections system will be a substantial undertaking requiring several programmatic components. The development and implementation of population specific screening tools would meet one of these needs. In two previous surveys of corrections systems, lack of screening and diagnostic services were identified as important gaps in existing service systems for offenders.<sup>14;15</sup>

Thousands of new offenders are placed in corrections systems each year in North America. Ideally, each one should be screened for FAS. This may be especially important in adolescent programs where the opportunity to prevent further incarceration or contact with criminal justice and the prevalence of FASD and related disorders may be high.<sup>13</sup>

We present a proposed schema utilizing screening for referral of subjects to diagnostic clinics. None of the tools or methods proposed here have been normed on a corrections population. This should be an important prior consideration in any plan to utilize these tools.

A key to recognition of appropriate referrals requires a high index of suspicion of FASD or preferably a program of systematic screening in a corrections population. Ideally, the screening and referral process should occur early when the initial presentation occurs in the juvenile justice system. We present four screening options (A-D) which are summarized in Table 2. The goal for each option is presented with the required staff training, the resources necessary for implementation of the project, and the limitations of each option.

#### **OPTION A**

Use of FAS Indicators (Tool 1) to identify the 5 offenders most likely to have FAS. In this option the corrections staff discuss the offender population in their facility to identify the five

offenders who they consider most likely to meet criteria for FAS.

#### Implementation Plan

1. A two-hour in-service on FAS begins the process. The topics will include: risk markers for FAS; the prevalence of FAS; data from the corrections surveys from Canada and from the US;<sup>14;15</sup> the rationale for use of Tool 1 for identification of a pool of offenders at high risk for FAS; and the likely benefits of identification of offenders with FAS. The training would also discuss the records routinely available in the facility for each offender. Questions from the staff should be addressed.
2. Use Tool 1 to identify the five inmates most likely to have FAS. Five is a useful number since about five subjects represent a full day for a diagnostic clinic.
3. Diagnostic assessment of the five offenders to determine the number of affected cases. Then repeat the process.

#### Resources

- In-service training about two hours long
- Minimum staff time for identification (2–3 hours)
- Diagnostic services

#### Advantages

Low cost strategy to begin the screening process and to determine the yield from the program. This strategy will also identify program costs in terms of time and money and implementation barriers.

#### Disadvantages

Slow process if offender population is large.

#### **OPTION B**

Use existing corrections system records for a record review to identify offenders who are most likely to have FAS using tools 1 and 2 (table 4). In this option the corrections staff review existing records to identify offenders most likely to meet criteria for FAS.

Implementation Plan

1. In-service plan from Option A and discussion of Tool 2. Add 1 hour to the in-service.
2. Use Tools 1 and 2 to conduct record review system of 20-30 inmate records per day.
3. Select subjects using results of record review for referral of offenders considered to have increased likelihood to have FAS.
4. Complete assessment of referred offenders to determine the number of affected cases and repeat.
5. This strategy can also be used to further refine the cases identified in Option A.

Resources

- In-service training about two to three hours long
- Staff time for record review
- Diagnostic services

Advantages

Rapid, low cost method to screen potential population. In some settings a computerized search may accomplish much of the record review and reduce the staff time commitment.

Disadvantages

While many offenders may have incomplete records, many will have useful data in their records.

**Table 2: Summary Schematic of the Four Proposed Screening Strategies**

Option	Cost	Time	Resources	Outcome	Tools
A	Low	1 day	Training: 2-3 hours, meeting of staff to identify with inmates	List of 5 likely inmates	1
B	Moderate to no new staff required	3-4 inmates per hour	In-service: Time, staff commitment, space to review records and discuss results.	Useful estimate of screening data available in corrections records. Useful step for future planning. List of inmates likely to have FAS and when diagnosis is completed ability to estimate benefit of record based screening program.	1 & 2
C	High  May require up to 1 FTE for screening	10 new prisoners a day per screener and 1 day a week for a diagnostic team if diagnosis is a component	In-service: Staffing needs space, diagnostic services.	Systematic population based data. After a few months or 1 year, a) data on screening tool performance and; b) efficiency of both screening and; c) diagnostic strategy. d) Prevalence – estimates in population	1 & 2  1 & 3
D	Very high, large staff commitment	Screening 20 prisoners a day. Each screening day will require 1 day of diagnostic services. Each 3 days of diagnostic services require 1 day of staffing and planning	High capacity screening and diagnostic clinic. Post diagnostic staffing.	Systematic population based data. After a few months, a) data on screening tool performance and; b) efficiency of both screening and diagnostic strategy will be available. c) Prevalence estimates in population will also be available	1 & 2  1 & 3

**Table 3: Findings that Should Suggest Increased Risk of FAS/FAE in a Corrections System Tool 1**

	Score
1. Sibling with FAS or a related disorder	5
2. Adoption	2
3. Previous foster care placements	3
4. IQ < 80 or mental illness	2
5. Maternal death from complications of alcoholism	4
6. Facial features of FAS or short stature probably only readily apparent in typical or severe cases of FAS in adults.	2
7. History of maternal alcohol treatment	2
<b>TOTAL SCORE</b>	_____

**OPTION C**

Screening of new offenders using Tool 1, 2 or 3 or a combination of the three. This is an active, prospective screening strategy which can be used to estimate prevalence, estimate the epidemiologic performance characteristics of the tool(s) used in the screening program, and also for the screening program as a programmatic entity.

Implementation Plan

1. In-service plan from Option A and discussion of tools 2 and 3. The in-service would also cover development of a plan to screen all offenders entering the corrections system after a selected date. Add 2 hours to the in-service to discuss the advantages of a screening program in a corrections system. This would include the importance of identification of affected offenders, the need for prevalence data on FAS in the corrections systems, the need to evaluate screening strategies to determine if they work and if they are cost effective.
2. Systematic facility based screening using tools 1 or 2 or 3 or a combination of the three for all new prisoners entering the facility. On a set date, as each new prisoner is admitted screening takes place as part of the intake process.

Screening Process

- Review of records
- IQ data
- Height
- Weight
- Face
- Indicators (Tool 1)
- List of positive screens

Resources

- In-service training three to four hours long
- Staff time for screening
- Diagnostic services

Advantages

Begins with a manageable population of people to be screened each day or week and identifies offenders requiring diagnostic work-up. The data from the diagnostic clinic can be reviewed and in some cases additional data can be requested or obtained to complete the evaluation. This strategy utilizes a process that can be refined and will produce a prevalence estimate in the population. This strategy will also produce epidemiologic performance characteristics for each tool in the screening system as well as performance estimates for the screening process.

Disadvantages

Requires infrastructure development before any data is available. Infrastructure needs are primarily staff time which depends on the number of new offenders admitted each day or week. Both

a screening strategy and diagnostic services must be available.

## **OPTION D**

This component utilizes total population screening of all offenders in a population or facility using Tool 1, 2 or 3 or a combination of the three. This is an active, prospective screening strategy which can be used to estimate prevalence and to estimate the epidemiologic performance characteristics of the tool(s) used in the screening program and for the screening program as a programmatic entity.

### Implementation Plan

1. In-service plan from Option A and a discussion of the use of Tools 2 and 3. Add two hours to the in-service to discuss the advantages of a screening program in a corrections system. This would include the importance of identification of affected offenders, the need for prevalence data on FAS in the corrections systems, the need to evaluate screening strategies to determine if they work and if they are cost effective.
2. Systematic facility-based screening using Tools 1 or 2 or 3 or a combination of the three for all offenders in a pre-selected population or in a facility. On a set date all offenders present in the facility are screened.

### Screening Process

- Record of records
- IQ
- Height
- Weight
- Indicators (Tool 1)
- Face

### Resources

Depending on the screening tools utilized the staff commitment may be very large and the number of referrals will require access to a high capacity diagnostic service.

### Advantages

Rapid completion of population based estimates of prevalence from screening and diagnostic

services. Process allows for both sensitivity and specificity estimates of screening tools. The cost of screening and diagnosis can also be determined. Efficient but intensive utilization of staff resources.

### Disadvantages

Substantial preparation period, large commitment of resources, intensive staff commitment. Costs of diagnostic services will be high.

## **DIAGNOSIS**

In order for screening to be effective access to diagnostic services is required. A basic assessment would include:

1. Intelligence testing with adaptive behavior testing;
2. Neurodevelopmental evaluation; and
3. Additional emphasis on levels of reading, reading comprehension, oral comprehension, memory and attention.

A dysmorphology examination should be completed. This will be improved by access to birth records and developmental information. Information on growth and pictures of the face from ages 2-12 are likely to be helpful and information on prenatal alcohol exposure is important. In many cases the exposure information will only be available from records or collateral sources.

The development of diagnostic systems required for persons with suspected FASD from the corrections system is important. Depending on the available data the evaluation of referred subjects may take 1 to 5 hours per person. The time required is dependent on the amount of data available to the diagnosticians on exposure, intelligence quotients, birth defects and affected family members. Since most corrections systems do not have access to diagnostic clinics, identifying a few offenders who are most likely to have FASD would be an efficient and economical starting point for development of diagnostic capacity. A gradual start may have several advantages including increased ease of access to diagnostic services and staff education.

## **DEVELOPMENT OF EPIDEMIOLOGIC PERFORMANCE CHARACTERISTICS OF THE SCREENING TOOLS**

The three tools described in this paper are not normed or validated in corrections populations. The only way to develop the data required to determine the sensitivity and specificity of these approaches is to utilize the strategies. After the screening strategy has been applied the performance characteristics can be determined. This should include sensitivity, specificity, accuracy, and positive and negative likelihood ratios. Thus, each system can select the combination of screening approaches that meet their required needs.

The translation of the results into a plan for each affected person will also require some additional planning and coordination. These efforts would utilize data from the diagnostic evaluation that identify both the strengths and impairments in social and cognitive skills. Access to additional research will be required to determine if appropriate management will impact recidivism and increase the number of offenders that could be managed in community corrections. Early identification may enhance prevention of secondary disabilities.<sup>9;12</sup> This could generate substantial cost savings.<sup>16;17</sup>

Data from a comprehensive screening diagnostic program would be very useful in development of training for corrections staff. Developing effective training programs on FASD for thousands of corrections system's staff is also a substantial undertaking. Each corrections program should have access to a core group of staff trained to provide in-service training to corrections staff in their state.

FASD is an important issue for women in the corrections systems, many of whom will have a history of alcohol abuse. Some women have multiple children with FAS, pFAS or ARND. Thus FAS, pFAS or ARND are useful risk markers for living siblings and in subsequent pregnancies. The population of women who have had a child with FASD represents a unique population of women for prevention activities.<sup>4;5</sup> The need for early identification extends to multiple other systems of care including foster

care and the special education system. One goal of these systems should be to prevent entry into the criminal justice system.

## **IMPROVING TRAINING AND PREVENTION IN THE CORRECTIONS SYSTEM**

Further research on prevalence rates in corrections systems and the development of epidemiologically acceptable screening and diagnostic systems needs to be completed. The effects of FASD on participation in their defense, adherence to prison rules and regulations, and meeting the conditions of parole are also important items for a research agenda on FASD in the corrections system. This research may profoundly affect the lives of thousands of people in the prisons. This in turn could improve the lives of the offender and their families, reduce the funding burden of corrections systems on society, and decrease future criminal activity.

**Table 4**  
**Tool 2**

**Correction System Screening Protocol for FAS**  
**Adult (Anyone 19 years of age or older)**

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Name _____	Date of Birth _____	Age _____	Sex _____
Location _____		Race _____	

**Step 1**  
Weight \_\_\_\_\_

Positive if less than	
128 lbs. for men	105 lbs. for women



**Step 2**  
Height \_\_\_\_\_

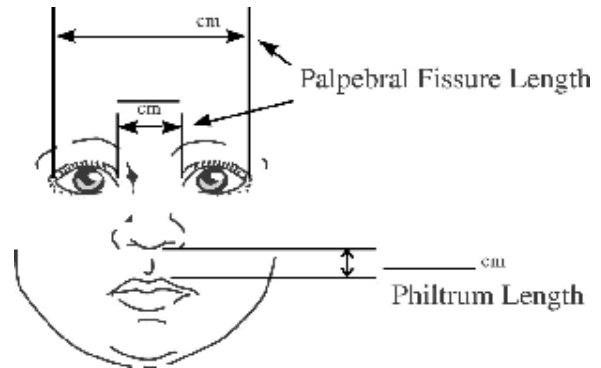
Positive if less than	
66 inches for men	61 inches for women

**Step 3**  
Head Circumference \_\_\_\_\_ cm

**Step 4**  
Physical findings  
Review Photographs

Check if present

- Thin vermilion border upper lip \_\_\_\_\_
- Flat philtrum \_\_\_\_\_
- Decreased supination \_\_\_\_\_
- Angulated distal palmar crease \_\_\_\_\_
- Other list \_\_\_\_\_
- Other list \_\_\_\_\_



**Step 5**  
Behavioral-Academic

	Grade Level	Standard Score		<u>Check if present</u>	
Reading	_____	_____	Below average IQ	_____	Impulsive _____
Spelling	_____	_____	Mental retardation	_____	Stubborn _____
Math	_____	_____	Attention Deficit/ Hyperactivity Disorder	_____	Seizures _____

Graduate from high school Yes \_\_\_\_\_ No \_\_\_\_\_  
If no, what was the last grade completed? \_\_\_\_\_  
Ever take medication for hyperactivity as a child? Yes \_\_\_\_\_ No \_\_\_\_\_



**Table 5: FAS Screening Form  
Tool 3**

Larry Burd, Ph.D.  
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FAS SCREEN FORM

Name \_\_\_\_\_ DOB \_\_\_/\_\_\_/\_\_\_ AGE \_\_\_\_\_ SEX (circle one) F M DATE OF EXAM \_\_\_/\_\_\_/\_\_\_

CHILD'S RACE (circle one)	HEIGHT _____ INCHES	<5%	Y ___ N ___	10
1) white	WEIGHT _____ POUNDS	<5%	Y ___ N ___	10
2) NA	HEAD CIR. _____ CM	<5%	Y ___ N ___	10
3) other				
	EARS STICK OUT (Protruding Auricles)		Y ___ N ___	4
	SKIN FOLDS NEAR INNER EYE (Epicanthal Folds)		Y ___ N ___	5
	DROOPING OF EYELIDS (Ptosis)		Y ___ N ___	4
	CROSS-EYES, ONE OR BOTH EYES (Strabismus)		Y ___ N ___	3
HEAD	FLAT MIDFACE/CHEEKS (Hypoplastic Maxilla)		Y ___ N ___	7
AND	FLAT/LOW NOSE BETWEEN EYES (Low Nasal Bridge)		Y ___ N ___	2
FACE	UPTURNED NOSE		Y ___ N ___	5
	GROOVE BETWEEN LIP & NOSE ABSENT OR SHALLOW (Flat Philtrum)		Y ___ N ___	5
	THIN UPPER LIP		Y ___ N ___	4
	CLEFT LIP OR CLEFT OF ROOF OF MOUTH (present or repaired)		Y ___ N ___	4
NECK	SHORT, BROAD NECK		Y ___ N ___	4
AND	CURVATURE OF THE SPINE (Scoliosis)		Y ___ N ___	1
BACK	SPINA BIFIDA (History of Neural Tube Defect)		Y ___ N ___	4
	FINGERS, ELBOWS (Limited Joint Mobility)		Y ___ N ___	4
ARMS	PERMANENTLY CURVED, SMALL FINGERS, ESPECIALLY			
AND	PINKIES (Clinomicrodactyly)		Y ___ N ___	1
HANDS	DEEP OR ACCENTUATED PALMAR CREASES		Y ___ N ___	4
	SMALL NAILS/NAIL BEDS) (Hypoplastic Nails)		Y ___ N ___	1
	TREMULOUS, POOR FINGER AGILITY (Fine Motor Dysfunction)		Y ___ N ___	1
	SUNKEN CHEST (Pectus Excavatum)      OPTIONAL		Y ___ N ___	3
CHEST	CHEST STICKS OUT (Pectus Carinatum)		Y ___ N ___	1
	HISTORY OF HEART MURMUR OR ANY HEART DEFECT		Y ___ N ___	4
	RAISED RED BIRTHMARKS (Capillary Hemangiomas)		Y ___ N ___	4
SKIN	GREATER THAN NORMAL BODY HAIR, HAIR ALSO ON FOREHEAD AND BACK (Hirsutism)		Y ___ N ___	1
DEVELOP	MILD TO MODERATE MENTAL RETARDATION (IQ < 70)		Y ___ N ___	10
MENT	SPEECH AND LANGUAGE DELAYS		Y ___ N ___	2
	HEARING PROBLEMS		Y ___ N ___	1
	VISION PROBLEMS		Y ___ N ___	1
	ATTENTION CONCENTRATION PROBLEMS		Y ___ N ___	2
	HYPERACTIVITY		Y ___ N ___	5

COMMENTS:

SCORE TOTAL \_\_\_\_\_  
Refer if 20 or above

For additional forms or information on FAS, FAE or ARND contact: Larry Burd, Ph.D.  
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