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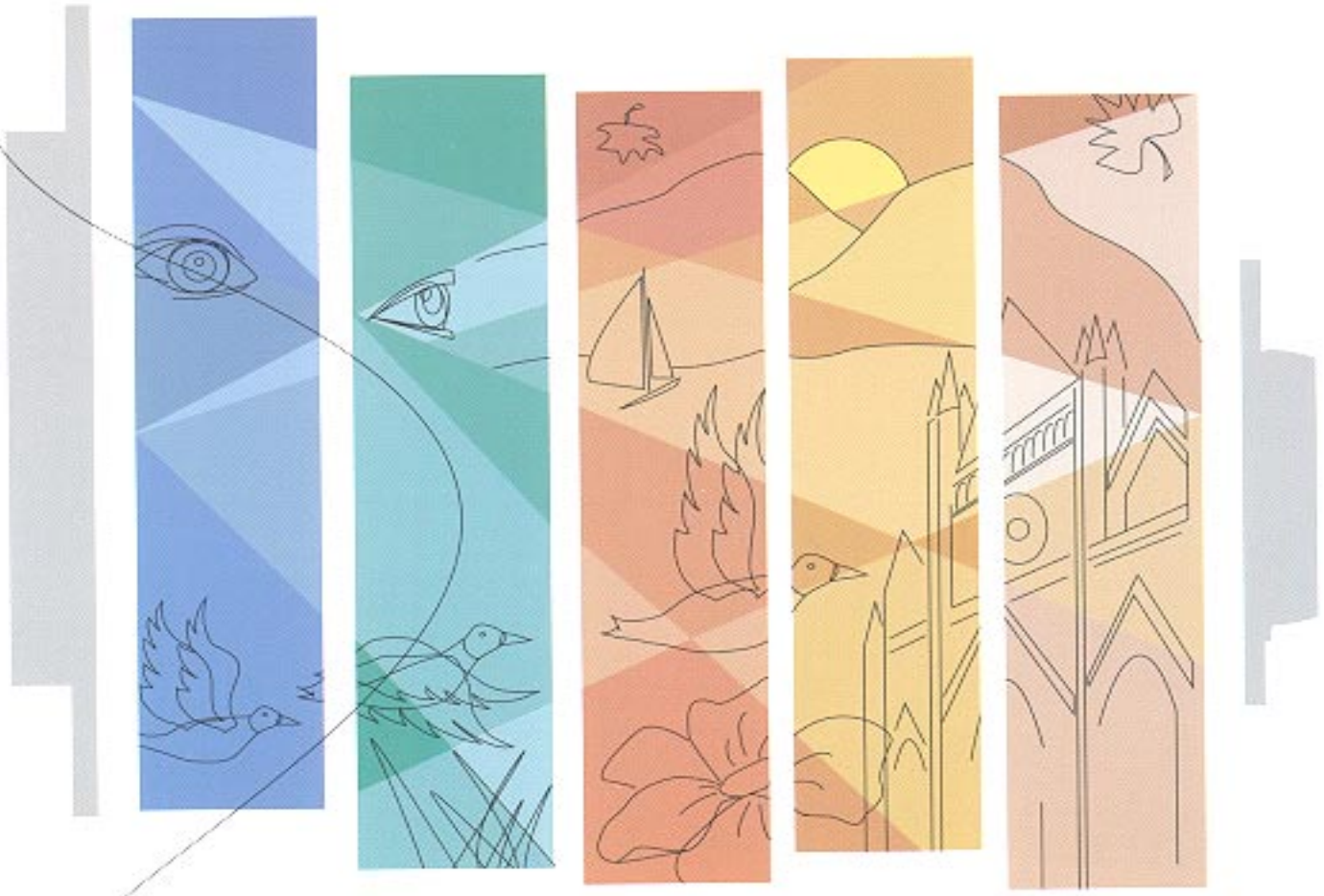
Fetal Alcohol Syndrome: Implications for Correctional Service



Canada

FETAL ALCOHOL SYNDROME:

IMPLICATIONS FOR CORRECTIONAL SERVICE

by:

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Table of Contents

EXECUTIVE SUMMARY

Damage resulting from alcohol to the fetus has been observed since biblical times, yet not until 1973 was it formally recognized as Fetal Alcohol Syndrome (FAS). Diagnosis of FAS requires a positive history of maternal alcohol consumption during pregnancy, as well as three criteria including prenatal and/or postnatal growth delay, characteristic cranio-facial anomalies, and central nervous system impairments.

An accumulation of research has also indicated more subtle forms of FAS which have been termed Fetal Alcohol Effects (FAE) and which often have two but not three of the formal features of FAS. In both FAS and FAE the damage is permanent.

At this point in time there are problems with diagnosing FAS/FAE in children, but with awareness on the part of health professionals and advances in knowledge and techniques, progress continues to be made.

The present estimate of the world incidence of FAS is 1.9 cases per 1000, and there is currently no national data for Canadian estimates of FAS or FAE. However, it appears that among certain Canadian Aboriginal groups, the incidence of FAS/FAE is much higher.

In addition to alcohol consumption and patterns of drinking alcohol by mothers, it should be recognized that there are a number of other situational and social maternal risk factors which are related to FAS/FAE such as socioeconomic status, multiple drug use, and poor health.

Infants with FAS/FAE display primary disabilities such as irritability, jitteriness, tremors, weak suck, problems with sleeping and eating, failure to thrive, delayed development, poor motor control and poor habituation.

In the preschool years, problems such as hyperactivity, attention problems, perceptual difficulties, language problems and poor motor coordination are common.

Once a child with FAS/FAE reaches school-age the primary disabilities are hyperactivity, attention deficits, learning disabilities, arithmetic difficulties, cognitive deficits, language problems and poor impulse control.

In adolescence and adulthood the primary difficulties are memory impairments, problems with judgment and abstract reasoning and poor adaptive functioning. Some common secondary disabilities characteristic of adolescents and adults with FAS/FAE include being easily victimized, unfocused and distractable, difficulty handling money, problems learning from experience, trouble understanding consequences and perceiving social cues, poor frustration tolerance, inappropriate sexual behaviors, substance abuse, mental health problems and trouble with the law.

Common risk factors which may increase the number of secondary disabilities include poor home environment, abuse and neglect, and familial upheaval. Common protective factors which may reduce the number of secondary disabilities are a stable and supportive home environment and not being a victim of violence.

There is a considerable link between FAS/FAE, attention deficit disorder with or without hyperactivity, conduct disorder and delinquency and crime. The predictors that appear to be common to both individuals with FAS/FAE and individuals who become delinquent are hyperactivity, impulsivity, attention deficit disorder, low intelligence, poor school achievement, antisocial behavior and poor parental child-rearing.

We are only now learning about adults with FAS/FAE and know little about how to treat their multiple problems and nothing about their response to treatment efforts. We do know that many will come into contact with the criminal justice system and CSC in particular. A primary requirement is to identify these individuals in order that researchers can identify their treatment need and design, offer and evaluate correctional programs that will consider the particular cognitive and behavioral deficits of these individuals. The following recommendations are based on a review of the literature on FAS/FAE and how this information might be applied to assessment and programming strategies used by Correctional Service Canada:

Recommendations

- That the criminal justice system consider initiating its own pre-sentence investigative screening to determine if the individual in question has ever received a diagnosis of FAS/FAE.

This would allow for the primary and secondary disabilities associated with FAS/FAE to impact on all aspects of the criminal justice process from prosecution to parole release.

FAS/FAE individuals are definitely at increased risk for coming in contact with the criminal justice system and as medical personal become more aware of FAS/FAE the availability of an early diagnosis is more likely.

- It is likely that cases of FAS/FAE continue to enter the prison system unrecognized. Correctional Service Canada might consider developing a practical screening instrument for identifying suspected cases of FAS/FAE early in the incarceration process or acquiring such an instrument if one becomes available elsewhere.

The Offender Intake Assessment currently used by CSC may be a good place to start. What is needed is research that would determine if identifiable cases of FAS/FAE can be distinguished from patterns shown by the general population of offenders on this instrument. Alternatively, Streissguth's research group in Seattle, Washington has made considerable progress using a variety of instruments such as the Vineland Adaptive Behavior (and Maladaptive Behavior) Scale, the Fetal Alcohol Behavior Scale, the Symptom Checklist and the Life History Interview, supplemented with IQ and cognitive testing. Advances in photo identification are also promising. Suspected cases of FAS/FAE can be referred to a medical specialist for formal diagnosis.

- As an alternative to diagnosis, Correctional Service Canada might direct its screening efforts at identifying offender's specific learning problems (e.g. arithmetic disability, difficulty abstracting), attention problems (e.g. attention deficit disorder), and behavioral attributes (e.g. poor self-regulation, substance abuse) along the lines suggested by Spohr and Steinhausen (1987).

For reasons mentioned earlier in this paper, diagnosing adults with FAS/FAE is currently a difficult feat. The strategy suggested above also provides specific information about deficits and problems that can be very useful not only with those diagnosed with FAS/FAE, but to any inmate who is experiencing these difficulties. Thus, any services or programs offered to inmates would be based on identified need rather than diagnosis. In some ways this strategy would be an extension of the screening and assessment that CSC currently carries out with such batteries as the Computerized Lifestyle Assessment Inventory.

- If screening and diagnosis, or screening for FAS/FAE related problems, proves feasible, we recommend a centralized, computerized data base be instituted.

  This data base should prove valuable for research purposes, for institutional programming, and for risk management after release from prison.

- The criminal justice system and CSC in particular might consider designing an FAS/FAE Awareness Manual and implement in-service training at all levels in order to educate and raise awareness about this condition.

Program officers and psychologists might be considered for more in depth training about FAS/FAE and eventually take over the role of increasing awareness in other personnel, such as parole and classification officers.

- Should a sufficient number of FAS/FAE inmates be identified at a particular institution, CSC might consider appointing an advocate, such as a program officer very familiar with FAS/FAE, to help manage their behavior and look after their best interest.

Such an advocate would also be an excellent candidate for facilitating FAS/FAE awareness programs.

- Provided that inmates with FAS/FAE can be identified, CSC might consider designing and evaluating a special institutional program for this population that takes into consideration their specific cognitive deficits and behavioral patterns.

The suggested strategy would be to modify existing, well recognized programs in the areas of social and life skills, cognitive skills, substance abuse and anger management in the direction of making them more structured, concrete and repetitive, allowing more time for review and practice, and presenting material in shorter but regular segments. One strategy for accomplishing this may be to ask the original authors of these programs to consult with others who have expertise in FAS/FAE and/or expertise in working with developmentally handicapped or brain damaged adults. Also, given the high proportion of Aboriginals with FAS/FAE and their similar over representation in the criminal justice system, it may be useful to consult with a culturally sensitive expert in this area.

- Programs should be carried out in small groups by facilitators who understand the cognitive, and behavioral deficits of FAS/FAE individuals.
- Treatment of mental health problems in FAS/FAE offenders, such as depression and suicide ideation are best dealt with in individual therapy by psychologists or psychiatrists with knowledge of FAS/FAE patterns.
- Because of their permanent neurological deficits and the many secondary problems these deficits generate, FAS/FAE inmates will require extensive planning for their release.

Safe and appropriate housing that allows them to establish structure and routine, job training that allows them to work within their abilities, continued social and life skills training that allows them to improve their adaptive functioning, a long term relapse prevention and maintenance program for those with substance abuse needs, and close and supportive monitoring would all help ensure that a stable and successful transition to community life would be made. As with institutional programs, evaluation should be built in to ensure further refinement as to what works with this difficult population.

FETAL ALCOHOL SYNDROME:

IMPLICATIONS FOR CORRECTIONAL SERVICES

This report reviews the literature on Fetal Alcohol Syndrome from the perspective of the implications this condition might have for the criminal justice system and for Correctional Service Canada. The report is presented in three parts. Part 1 provides a basic background about the disorder. Part 11 traces the course and consequences of this condition, including the connection to delinquency and crime. Part 111 considers the possibility of identifying fetal alcohol syndrome and related effects in individuals who come in contact with the criminal justice system, and how institutional and post-release programs might best fit their needs.

PART 1: BACKGROUND

Alcohol is the one of most toxic substances voluntarily consumed by humans. Alcohol is also capable of disrupting fetal development as it freely crosses the placenta in pregnant women who choose to consume alcohol during their pregnancies. The metabolism and elimination of alcohol are slower in the fetus (approximately half the adult rate), and the concentration of alcohol is at least as high in the fetus as in the mother's blood (Niccols, 1994; Streissguth, 1983; Abel, 1990).

Reference to negative effects of alcohol to the fetus can be found in documents dating back as far reaching as the Old Testament (Niccols, 1994). However, not until much more recently were possible effects of drinking alcohol on offspring seriously explored in North America and in Europe. Slowly during the 1950's and 1960's, studies began to focus on the hereditary basis of birth defects in disorders like Down Syndrome, and during this time period French researchers also began describing children of alcoholic mothers as having malformations and growth deficits (Abel, 1990). Research surrounding pregnancy and alcohol increasingly became of interest with publications identifying a variety of alcohol related birth defects, and finally in 1973 a pattern of physical features and behavioural deficits found in infants and children of mothers who consumed alcohol during pregnancy was formally recognized as FAS (Jones and Smith, 1973). This medical term brought the existence of FAS to the attention of many professionals, and it clearly defined this syndrome in terms of the causal agent of alcohol.

The past two decades have since been filled with numerous studies, clinical reports, and experimental research with animals, indicating that alcohol is clearly a teratogen which can have numerous and serious consequences on fetal development. The purpose of the first section of this

report is to provide a review of Fetal Alcohol Syndrome as a complex, multi-determined syndrome which has serious implications for problematic behaviour and development.

Diagnosis and Description

Fetal Alcohol Syndrome is one form of alcohol related birth defects which subsumes a number of specific abnormalities in children whose mothers consumed alcohol during pregnancy. In addition to the identification of a positive history of maternal alcohol consumption during pregnancy, there are three core diagnostic criteria which must be met for a clinical diagnosis of FAS (Conry, 1990). These features include: 1) prenatal and/or postnatal growth delay and retardation; 2) characteristic cranio-facial anomalies; and 3) central nervous system (CNS) impairments.

Prenatal and Postnatal Growth Delay. Children born with FAS have a reduction in body weight, height and head circumference (Streissguth et al., 1991; Abel, 1990). As infants, American studies have indicated that the median weight of all live children born with FAS is 4 lb 11 oz, which is below the 7 lb 7 oz median in U.S. infants (Abel, 1990). Continuing into childhood and adolescence, the head circumference of these children remains below the tenth percentile (Niccols, 1994; Abkarian, 1992) or two standard deviations below the mean (Streissguth et al., 1991). Additional studies have indicated that patients with FAS are still below the third percentile in cranial growth in adolescence (Shaywitz, Cohen & Shaywitz, 1980; Niccols, 1994). This cluster of growth deficiencies are among the most common effects observed in children with FAS (Abel, 1990), but birth weights and heights may differ depending on the

amount of alcohol consumed during pregnancy. Severe growth deficits are also usually related to severe intellectual disabilities (Abkarian, 1992).

Distinct Facial Dysmorphology. The pattern of facial dysmorphology observed in children with FAS is the criterion that is most specific to this syndrome (Huebert & Raftis, 1996). In fact, a diagnosis of FAS can be made based solely on a physical examination (Huebert & Raftis, 1996), but it is helpful to establish the maternal drinking history during pregnancy. Also, where maternal drinking is low or moderate, facial features may not be distinct enough for an agreement of diagnosis (Abel, 1990).

The characteristic pattern of facial abnormalities most commonly reported in FAS are short palpebral fissures (horizontal length of eyes), epicanthic folds (abnormal skin folds in the inner corner of the eye), long and flattened philtrum (space between nose and upper lip), flattened maxilla (bones forming the jaws and midface), and shortened nose (Huebert & Raftis, 1996; Abel 1990).

In addition to these discriminating features, there are also a number of associated features of FAS. Of these secondary anomalies, visual disorders such as optic nerve anomalies (cataracts) and myopia, oral problems such as cleft palate and dental problems (crossbite, overbite) and ear abnormalities are common (Church & Kaltenbach, 1997). Children with FAS are at high risk for a variety of hearing disorders, and the majority of FAS children have at least one type of hearing problem (Church & Kaltenbach, 1997). The four most commonly occurring hearing disorders associated with FAS are developmental delays in auditory maturation, sensory neural hearing loss, intermittent conductive hearing loss, and central hearing loss, all of which can result in

permanent impairment to hearing, language, and mental abilities (Church & Kaltenbach, 1997). Adequate hearing is critical for proper speech and language acquisition and comprehension, so hearing disorders may worsen existing behavioural and intellectual problems, thus leading to learning disabilities, inattention, language pathology and disruptive behaviours (Church & Kaltenbach, 1997).

Central Nervous System Dysfunction. The influence of prenatal alcohol exposure on central nervous system (CNS) development has also been explored. Recent research has indicated that glial cells which compromise approximately half of the brain's volume and which play an important role in brain development are sensitive to alcohol and increase the vulnerability of the brain to serious damage (Lancaster, 1994). Niccols (1994) has proposed several different stages of embryo development during which alcohol damages the central nervous system differentially: from conception to the first weeks of pregnancy alcohol acts as a cytotoxic agent causing cell death and chromosomal abnormalities; From four weeks to ten weeks in utero alcohol exposure leads to abnormal cell migration, cell loss and damage, disorganized cell tissue structure, and microcephaly; and from eight to ten weeks of pregnancy neurotransmitter production is interfered with leading to suppression of growth hormones, and abnormal formation of neural synapses resulting in neurological deficits (Niccols, 1994). Streissguth (1997) further adds that the greatest period of vulnerability in the brain is uncertain; it seems that all trimesters during pregnancy are critical for development.

Central nervous system damage from prenatal alcohol exposure results in permanent impairments such as neurological abnormalities, behavioural dysfunctions, developmental

delays, and intellectual impairment (Huebert & Raftis, 1996). As a result of these damaging effects on the developing nervous system, an abundance of research has indicated cognitive-behavioural difficulties in children with FAS. These problems include impairment of selective attention and decreased speed of information processing (Yellin, 1984; Lancaster, 1994), delayed and disordered motor development, disordered speech and language development, short term memory deficits, learning difficulties, and hyperactivity and impulsivity (Kodituwakku et al., 1995; Abkarian, 1992). Attentional problems (which have been identified as a major deficit in FAS children) are especially problematic because they have negative consequences on other cognitive functions like rehearsing and storing information in memory, and information processing (Kodituwakku et al., 1995). Other research by Mattson et al. (1996) has suggested that the locus of memory impairments may be at the encoding level of information processing where individuals with FAS have difficulty inhibiting correct responses. Mattson et al. (1996) propose that the brain areas involved in these response inhibition deficits are the hippocampus, the frontal lobes, and the basil ganglia.

As information accumulates about specific alcohol related cognitive deficits, it appears that FAS individuals have profound and permanent learning and intellectual impairments. Although the range of intellectual functioning varies, FAS is now considered to be the leading cause of mental retardation in North America (Streissguth et al., 1991). Most average intellectual assessments of FAS children, utilizing a variety of IQ tests, estimate they function at a level from 65-70 IQ point scores. Scores below 70 indicate mental retardation. Abel (1990) found an average IQ of 67 among FAS children, with 53% of patients scoring below 70 in his study, Conry

(1990) similarly found 68% of FAS patients below 70, Streissguth et al. (1991) found an average of 66 with 58% scoring below 70, and Abkarian (1992) observed an average of 65. These studies all reported wide ranges of impairment from 20 (severe retardation) to 105 (normal). Often, such poor intellectual functioning results in serious academic disabilities (Streissguth et al., 1991).

What is clear from the diagnostic criteria of FAS, is that there are numerous physical, neurological and intellectual abnormalities in individuals with this syndrome. These features unfortunately lead to a variety of serious secondary cognitive, emotional, behavioural and developmental problems (Conry, 1993; Huebert & Raftis, 1996; Shaywitz et al., 1980). These difficulties are consistent, disabling, and seriously affect their adaptive functioning over their lifespan.

Fetal Alcohol Effects

It is important to recognize that there is a wide range of alcohol effects which extend beyond those individuals with FAS, and which can affect the fetus at many levels of maternal alcohol consumption. An accumulation of research has indicated evidence of more subtle forms of FAS which have been termed Fetal Alcohol Effects (FAE) (Huebert & Raftis, 1996). Fetal Alcohol Effects are sometimes called partial FAS, Fetal Alcohol Embryopathy or Alcohol Related Neurodevelopmental Disorder (Conry, 1990; 1993). In this paper we have adopted the term FAE throughout. Children with FAE are adversely affected by prenatal alcohol exposure, but they do not meet the formal criteria of FAS (Mattson et al., 1996). Despite this lack of diagnostic features, the great majority of researchers agree that FAE involve those infants or children who meet two, but not three, of the features formally associated with FAS (Huebert & Raftis, 1996).

Therefore, in addition to receiving alcohol exposure in utero, such a child may have some partial FAS phenotype, subtle facial dysphormology, or CNS dysfunction but will not have sufficient features for a firm diagnosis of FAS or an alternative diagnosis (Streissguth et al., 1991).

The resulting behavioural, developmental and neurological problems associated with FAE strongly overlap with those of FAS. Average IQ ranges in children with FAE are slightly higher and are more often in normal ranges than in FAS individuals, but many still have sub-average levels of intelligence (Abkarian, 1992). Difficulties such as unevenness in academic abilities, learning disabilities, poor math skills, cognitive deficits, self regulation difficulties, and behavioural and social impairments are equally disabling in children with FAE as those with FAS (Donovan, 1992; Abkarian, 1992; Koditawakku et al., 1995). Unfortunately, cognitive deficits in those with FAE often go unnoticed or are misinterpreted for poor motivation (Abkarian, 1992). As Donovan (1992) adds, these children may actually face more serious problems because their symptoms are not recognized as FAE. Other research studies evaluating abilities in both FAE and FAS children indicate the occurrence of specific deficits of motor speed, grip strength, word comprehension, visual-motor integration (Mattson et al., 1996, Conry, 1990), response inhibition, visual-spatial planning, attention, concentration, and higher level processing (Kopera-Frye, Dehaene, & Streissguth, 1996). These deficits may be more severe in children with FAS, but children with FAE do exhibit a variety of these difficulties, and some to extremely serious degrees (Conry, 1990).

Because FAE are not recognized in a formal diagnosis and is difficult to identify, it can go unrecognized in most clinical and research settings, and there is no national data on its incidence.

It is important to realize that despite this lack of recognition, FAE appears to be more common in individuals with prenatal alcohol exposure than is FAS (Donovan, 1992), and that these effects are not necessarily milder forms of FAS because behavioural and functional impairments associated with FAE have serious, long term consequences comparable to those of FAS (Huebert & Raftis, 1996). Still, some researchers discourage the term FAE because it involves such a subjective and uncertain diagnosis, which can in turn lead to a variety of problems such as assuming that alcohol is the only cause of the child's problem or basing expectations of the child's behaviour on FAS (Huebert & Raftis, 1996; Abkarian, 1992). FAE has none-the-less remained the most common term used by researchers and clinicians.

Many researchers do advocate the necessity of recognizing the more subtle and ambiguous effects of FAE, not only because of the increasing evidence in its favour, but because it is practical to report areas of concern regardless of whether a definite diagnosis can be established (Huebert & Raftis, 1996). With research indicating that alcohol induced abnormalities can occur even in the presence of normal head circumference and appearance, it seems wise to extend this analysis to both FAS and FAE.

The presence of FAE as well as FAS suggests a continuum of alcohol effects. The severity of effects on this continuum depends on the amount of alcohol consumed by the mother, the stages of pregnancy during which alcohol is consumed, additional maternal factors like metabolism, nutrition and genetic make-up, and the response of the fetus (Conry, 1993;Weiner, Morse & Garrido, 1989). That is, there does seem to be a direct association between blood alcohol concentration and adverse fetal development where greater dosages anticipate more severe

responses (Weiner et al., 1989; Streissguth, 1997; Driscoll, Streissguth & Riley, 1990). This continuum is further supported by substantial evidence of a spectrum of dose-related effects in numerous animal studies (Driscoll et al., 1990). Most documented cases of FAS have been born to women who are heavy or abusive drinkers, and heavier intake of alcohol has been associated with slower fetal growth in height, head circumference and increased facial dysphormology (Weiner et al., 1989; Russell et al., 1991). However, even low dosages have adverse effects on the fetus in regards to growth, morphology, and CNS dysfunction (Little et al., 1990).

The threshold of alcohol consumption that produces damage is not easy to determine. Most measures have thresholds ranging from 7 to 42 drinks per week as measured prior to and during pregnancy (Jacobson & Jacobson, 1994). Based on consistent findings across a large number of neurobehavioural studies, some research has indicated that 4 to 8 drinks per day have been associated with FAS, where as 2 to 3 drinks per day has been linked with FAE (Little et al, 1990). Research suggests that the most adverse neurobehavioural effects occur at levels above 7 drinks per week, thus, 7 drinks seems to be a common threshold in this respect (Jacobson & Jacobson, 1994). Still, some neurobehavioural effects have no threshold and are so sensitive that their effects are observed at very low levels of exposure (Jacobson & Jacobson, 1994) and there remains uncertainty as to the lowest dosage at which alcohol effects have a meaningful impact. Prenatal alcohol exposure for a single day can be damaging, producing brain growth defects and neuron loss if high blood alcohol concentration levels are obtained (West et al., 1990). Drinking before pregnancy has even been linked to poor fetal development (Little & Wendt, 1991).

Different patterns of drinking are also important for consideration. For example, individual differences in children with and without FAS born to women who drink the same amounts of alcohol may be due to differences in patterns of alcohol consumption. Although both regular drinking patterns and binge drinking patterns predict neurobehavioural deficits before and during pregnancy, West et al. (1990) suggest that a smaller daily dose may be more damaging than a larger daily dose if it is consumed in an acute binge pattern that results in higher blood alcohol concentration levels. Researchers are increasingly adopting the view that there is no safe level of alcohol consumption during pregnancy (Streissguth et al., 1991).

In deciding where FAS and FAE fit into the continuum of alcohol effects, the Institute of Medicine (1996) proposes a five category system to describe the spectrum of prenatal alcohol effects. Categories 1 and 2 represent the most severe ends of the continuum and are indicated by FAS both with or without confirmed maternal alcohol exposure. Category 3 represents partial FAS involving prenatal alcohol exposure, evidence of some pattern of characteristic facial anomalies, and either a) growth retardation, b) CNS neurodevelopmental difficulties, or c) behavioural/cognitive abnormalities that are inconsistent with developmental level. Category 4 is represented by alcohol related birth defects involving a wide range of congenital abnormalities, and Category 5 is indicated by FAE which include the criteria of CNS neurodevelopmental difficulties and behavioural/cognitive abnormalities from the third category. Other researchers have suggested similar inclusive categorization systems for FAS with a range of severity according to a point system (Niccols, 1994).

In summary, FAS does not represent all individuals who are exposed to alcohol in utero, rather it reflects the severe end of a continuum of effects from maternal alcohol consumption. Furthermore, it is important to address the "lower" ends of the continuum because even small dosages of prenatal alcohol exposure can be debilitating to fetal development and can cause permanent damage.

Issues in the Diagnosis of Childhood FAS/FAE

Identification of FAS is most often undertaken by a trained physician, geneticist or dysmorphologist based on a physical examination, birth records, history of maternal drinking and characteristics in growth deficiencies or CNS dysfunction (Abkarian, 1992; Astley & Clarren, 1995). The professional must be additionally trained to recognize birth defects which distinguish FAS and FAE from other medical conditions (Conry, 1993). Despite over two decades of research, diagnosis and identification of FAS and FAE continue to remain a critical concern for researchers, medical professionals and society as a whole. Accurate diagnosis is problematic for a number of reasons, including patient characteristics, assessment techniques, and sources of bias.

First, with no single feature being uniquely characteristic of FAS and with this syndrome's sometimes subtle symptoms, FAS may closely resemble other malformations like Stickler Syndrome or Lange Syndrome (Niccols, 1994). Diagnosis becomes even more complex when a mother's alcohol intake is not documented as sufficient to produce physical characteristics commonly observed in FAS (Yellin, 1983). Central nervous system damage and brain dysfunction can still occur without facial dysphormology, and yet the absence and subtleness of facial features in infancy may result in underdiagnosis.

Second, the absence of standardized tools to specifically test for this syndrome also leads to uncertainty as there is currently no laboratory test to make any kind of chromosomal diagnosis (Abkarian, 1992). What complicates diagnostic efforts further is the fact that infancy is a difficult time to recognize FAS and FAE. As an individual develops over time, the appearance of facial and growth symptoms may vary with age (Huebert & Raftis, 1996; Conry, 1993). Additional obstacles are difficulties in measuring maternal alcohol abuse and intake, identifying whether neurobehavioural abnormalities are due to prenatal exposure to alcohol or to a postnatal environment, and realizing that diagnostic criteria cannot easily be applied across different cultures as some facial features of FAS are common in other cultures such in Afro-American and Native American communities (Huebert & Raftis, 1996).

A recent Saskatchewan study (Nanson et al., 1995) has indicated that year of graduation from medical school by family and general practitioners may be another significant factor in awareness and diagnosis of FAS. In this study, those doctors who graduated before 1974 (when FAS was first being described in literature) were less likely to have knowledge of FAS and to ask their patients about alcohol intake during pregnancy than more recent graduates (Nanson et al., 1995).

Finally, there are other confounding variables in research and clinical settings which interfere with diagnosis including interviewer bias, socioeconomic status, nutritional differences in samples, substance use other than alcohol use by mothers, and disagreement of FAS or FAE diagnosis (Little et al., 1990). Until these challenges are overcome, there are unfortunate and serious consequences including failure of diagnosis that individuals will have to endure. For example, one sobering study by Little et al. (1990) found that despite physical features of FAS

being reported in medical records of 40 infants and a positive history of maternal drinking during pregnancy in these cases, there was a 100% failure rate by hospital staff to diagnose FAS. Thus, in addition to a need for improved assessment techniques, there is a need for increasing awareness and communication about FAS and FAE.

Despite the relative concern surrounding the issue of diagnosis, there are some efforts being made to develop more effective screening tools. Astley and Clarren (1996) have showed that an accurate phenotypic case definition of FAS can be derived from photographs that accurately distinguish between those with and without FAS. These researchers have successfully used photo analysis in which sensitivity of identification is unchanged by race, gender or age, and which appears to have serious potential as a diagnostic tool (Astley & Clarren, 1996). They suggest that no two individuals with FAS have identical facial features but they all have an overall gestalt, thus, a multivariate approach can be used to identify the minimum number and magnitude of features that most accurately distinguish FAS individuals from non FAS individuals (Astley & Clarren, 1996). The authors point to advantages of using this type of photo analysis approach with facial features specific to FAS in that photo analysis is inexpensive, expert photographers are not required, photographs can be transferred electronically to maximize consistency in interpretation, photographs can be stored and analysed anonymously, and individuals can be targeted for intervention. If this screening tool continues to be demonstrated as a sensitive, accurate, reliable and precise instrument through further testing of its validation, it may greatly improve current problematic diagnosis situations. However, it is not clear if this technique will prove useful in identifying FAE.

Ideally, FAS and FAE require thorough multi-method assessment involving family interviews, professional interviews and reports, observations of the child, information on the child's developmental history, assessment of the child's intellectual, perceptual speech and language abilities, as well as information on social behaviour, psychopathology and mental retardation (Yellin, 1983). Clearly there is much work to be accomplished before assessment of this calibre can be reached. The possibility of identifying individuals who may have FAS/FAE in the criminal justice system will be discussed later in this paper.

Incidence and Prevalence of FAS/FAE

Patterns in diagnosis of FAS and FAE unfortunately contribute to impediments in determining the incidence and prevalence statistics of these syndromes. Many estimates are dependent on definitions and criteria of FAS (Abel & Sokol, 1991), thus, the estimates that do exist, whether they are world, North American or Native community statistics, are likely to be conservative (Abel & Sokol 1991).

The present estimate of the world wide incidence of FAS is 1.9 cases per 1000 (Abel, 1990). Similarly, the American incidence of FAS is estimated to be between 1-2 cases per 1000 (Nanson et al., 1995). There is no national data for Canadian estimates of FAS, although tens of thousands of adults are estimated to have the syndrome ("FAS: From Awareness to Prevention," 1992; Donovan, 1992). For women who have already had one child with FAS, their risk of reoccurrence is very high with an incidence estimate of 771 out of 1000 (Huebert & Raftis, 1996). The first report in Canada of the incidence of FAS for an entire province was conducted in Saskatchewan and published in 1996 (Habbick et al., 1996). All cases who were born in

Saskatchewan prior to January 1st, 1993 were studied. In total, 207 cases of FAS were identified in this study with 86% of these cases consisting of Aboriginals (Habbick et al., 1996). The authors additionally concluded that due to the likelihood of under-diagnosed cases throughout the province that their incidence statistics were underestimated. Virtually all studies of epidemiology have concluded that FAE have an incidence of 3 to 4 times higher than FAS (Donovan, 1992; Habbick et al., 1996). However, because FAE are less likely to be consistently diagnosed or to be observed by a health care professional, they continue to be undetected.

Aboriginal Populations

An accumulation of research has indicated that the incidence of FAS differs across Canada and the United States with some areas having much higher rates than others. These differences seem to lie within different Native cultural groups whose incidence of FAS/FAE has been documented to be as much as ten times higher than general population estimates (Abkarian, 1992). In the USA, FAS appears to be highest among American Indians in the Southwest. May et al. (1983) studied and screened all FAS suspects in Navajo, Pueblo and Plains (Apache and Ute) tribes who resided in 26 reservations consisting of a population of 240,000 people. The overall FAS incidence among these tribes were 6.1 cases per 1000 (May et al., 1983). This study also reported that among 22, 963 American Indians in seven communities in New Mexico, Arizona, and South Colorado that 300 cases of FAS and FAE were found, but that the prevalence was highly variable among the three different cultural groups. That is, in the Navajo communities the prevalence was 1.6 cases per 1000, for the Pueblos it was 2.2 cases per 1000, and for the

Southwest Plains the incidence was 10.7 cases per 1000. This latter group had higher rates of abusive drinking than the others and mothers had lower social adjustment, high risk lifestyles and a higher mean age of birth (May et al., 1983).

FAS among Native populations in Canada is also a concern. Bray and Anderson's (1989) review of the epidemiology of FAS among Canadian Native peoples illustrates high incidence rates through several studies. Sandor et al.'s (1981) study of 76 patients (69 of which were Native ancestry) in the Yukon territory and British Columbia indicated a 10.9 to 1 ratio of Natives with FAS to Caucasians. Asante et al. (1985; as cited by Bray and Anderson, 1989) who looked at 586 subjects in 36 Native communities in Yukon Territory and British Columbia found that the prevalence of FAS and FAE combined was 46 cases out of 1000 in the Yukon, and 25 cases of 1000 in British Columbia, and that prevalence rates for non Natives in this area were 0.4 cases per 1000 (Bray and Anderson, 1989). The highest reported prevalence was reported by Robinson, Armstrong, Moczuk, and Loock (1992) who studied 116 Native people from a British Columbia Indian reserve. The prevalence among Natives in this village was 190 cases per 1000 (Robinson et al., 1992). In addition to these high rates of FAS reported here, Burd and Moffat's (1994) review of FAS in North American Indians and Canadian Aboriginals also points to high prevalence and incidence rates in Alaska (2.7 per 1000 cases), Northern British Columbia (10.3 per 1000 cases), North Dakota (3.1 cases per 1000) and South Dakota (3.9 per 1000 cases). These authors note that among the ten studies they reviewed (including those reviewed by Bray and Anderson, 1989) consistent FAS criteria were used to determine CNS dysfunction, growth impairment, facial features and maternal alcohol consumption during pregnancy (Burd & Moffat,

1994). They also point out that the high prevalence observed may actually underestimate FAS in these populations as none of the ten studies examined all children in these populations who may have had FAS.

As North American Natives constitute culturally diverse groups, it is difficult to classify them together even though many appear to have much higher rates of FAS/FAE than found anywhere else. For example, within Native subcultures there are substantial differences among cultural tribes in social, geographical and economic circumstances and in cultural attitudes toward drinking (Aase, 1981). May et al., (1983) indicated that in Pueblo and Navajo tribes (where the incidence of FAS was much lower) there was much tighter control of alcohol use and more ostracism for women who drank, where as Plains' tribes (which had much higher frequencies of FAS) were more permissive of alcohol-abusive behaviour. The authors concluded that risk of FAS was better correlated with drinking styles of each cultural group than overall alcohol consumption levels (May et al., 1983).

Native subcultures also tend to have young populations where child bearing begins earlier and ends later (May, 1991). Bray and Anderson (1989) further note that in addition to cultural attitudes to alcohol, styles of drinking, and longer child bearing span, Native communities often lack rehabilitation programs for women which may compound high rates of FAS. Robinson et al. (1992) also investigated whether lack of knowledge of FAS among Native peoples may be another contributing risk factor. They interviewed 123 Canadian Aboriginals in Victoria and Vancouver and observed that virtually all women (96%) were aware of the danger of maternal drinking during pregnancy, that most women (85%) believed that there was no safe amount of

drinking during pregnancy, and that 40% of women knew someone with FAS (Robinson et al., 1992). However, though the majority had heard of FAS, gaps existed in their knowledge of its causation, characteristics, and implications.

There is much to learn about which factors are specifically responsible for placing Native women at risk for producing FAS/FAE children. As Bray and Anderson (1989) note, the lack of published research in Canada on the incidence of FAS/FAE in both Native and non Native populations make it difficult to compare these groups or to draw confident conclusions. Also, comparisons are further complicated because non Native studies have been conducted in clinical and urban settings where as Natives have been studied in small communities and reservations (May, 1991). Despite these inconsistencies between studies, there does appear to be greater problems of FAS for certain Native populations.

Estimated Cost of FAS

American estimates of financial costs of FAS have been tabulated, although no such Canadian estimates exist. Abel and Sokol (1991) conservatively estimate that the annual cost of FAS in the USA is 74.6 million dollars, 78% of which is accounted for by costs related to mental retardation and low birth weight. Streissguth et al. (1991) who also consider their estimate to be conservative, predict that financial costs of FAS patients to 21 years of age require 321 million dollars per year in the USA, and 1.4 million dollars across the life span of one child with FAS. Both of these estimates take into consideration costs for prenatal and postnatal growth retardation and mental retardation. Total annual costs should ideally account for select problems related to

FAS such as low birth weight, neural deficits, cleft palate, heart deficits, and auditory deficits (Abel, 1990). Not surprisingly, FAS related mental retardation accounts for higher residential costs than does Cerebral Palsy or Down Syndrome, and may account for one fifth of costs of all institutionalized mentally retarded patients in the USA (Abel, 1990).

As Abel (1990) importantly notes, these estimates are based on the economic impact of FAS which represents only an extreme in the continuum of abnormalities related to prenatal alcohol exposure. Financial costs to society are undoubtedly much higher when FAE and high risk Native communities are taken into consideration.

Maternal Risk Factors

It is important to remember that not all children born to alcohol consuming mothers have FAS and that the effects of alcohol range from an absence of any effect to fetal death. As previously discussed, severity of alcohol exposure depends on the amount of maternal alcohol consumption, the stages during pregnancy when consumption occurs, and patterns of drinking (Niccols, 1994). Risk also seems to be heightened by aboriginal status and in women with low socioeconomic status, who use multiple drugs, who have more than one child and who have short intervals between the births of their children (Niccols, 1994; Abel, 1990).

There are additional factors that place some women at higher risk for having a child with FAS. Maternal health and nutrition are factors which are important to consider. For example, mothers of FAS children tend to have more alcohol-related disorders such as cirrhosis, anaemia, amino acid deficiencies and increased psychiatric hospitalizations (Abel, 1990). Paternal influence is

often ignored in research literature, but studies which have mentioned fathers of FAS children have indicated that many are alcoholic and that paternal drinking is related to a small but significant decrease in infant birth weight (Abel, 1990). There is also a lack of research on genetic susceptibility, but reports of fraternal twins who do experience the same effects from alcohol exposure suggest that genetic variables may also be related to FAS (Abel, 1990).

May (1991) notes that women with drinking problems are often in situations of low social integration involving difficulties of unemployment, separation or divorce, and partners with drinking problems. Abel (1990) similarly concludes that women at risk of having FAS children appear to have a history of spontaneous abortions, a low pregnancy weight, poor health, low socioeconomic status, close contact with men who are heavy drinkers, and who are multiparous. Recognizing that there are a variety of maternal risk factors beyond direct alcohol consumption and patterns of drinking by mothers is important for both researchers and health care professionals in attempting to identify high risk groups of women. Although these risk factors are more situational and social in nature, they are still related to fetal outcome and may continue to contribute to poor maladjustment of children with FAS when they are born.

In summary, Fetal Alcohol Syndrome is a complex and multi-determined problem which presents a number of challenges to researchers, to medical professionals, and to society as a whole. Although many questions pertaining to FAS and FAE are being answered through the continuous accumulation of research that is taking place both in North America and in Europe, there remain substantial gaps in current knowledge of FAS and related issues. Future efforts must aim to clarify ambiguous terminology, criteria, and diagnosis of FAS and FAE and must attempt

to establish more objective and reliable diagnostic measures and assessment techniques. Additional research is also needed to address the current inadequate knowledge of the prevalence and incidence rates of FAS and FAE in Canada. Finally, there is a necessity for more data on alcohol consumption patterns and drinking styles of Canadian Aboriginal women of child bearing age to be clearly identified and to become a priority for researchers and clinicians. These challenges are not easy ones to overcome, but it is crucial to seriously confront these issues if there is to be an advancement in attaining a more complete, comprehensive and accurate understanding of Fetal Alcohol Syndrome and Fetal Alcohol Effects.

PART 2: COURSE AND CONSEQUENCES

While children with FAS often display a physical phenotype which signifies their alcohol related deficits, once they grow older it is harder to identify them based purely on facial features. This is especially true of FAE. More specifically, changes in nose and mandible alter the overall facial phenotype (Streissguth, Clarren & Jones, 1985). There appears to be a behavioural phenotype which results from the central nervous system (CNS) effects of prenatal alcohol exposure. Abkarian (1992) asserts that FAS presents a behavioural phenotype as robust as physical characteristics in marking FAS. This phenotype designates people with FAS/FAE from childhood to adulthood but not all items apply to every person (Streissguth, 1997). It appears that "the behavioural manifestation of fetal alcohol syndrome (FAS) and fetal alcohol effects (FAE) vary with age" (Nanson & Hiscock, 1990, p. 656). This section outlines the characteristics of the behavioural phenotype in infancy, preschoolers, school-aged children, adolescents and adulthood. Following Streissguth's (1997) distinction, the problems are also categorized into primary and secondary disabilities. Primary disabilities are the result of brain damage caused by prenatal alcohol exposure. Secondary disabilities are possible consequences of primary disabilities and often surface as people with FAS/FAE mature. Among these consequences are delinquency and crime. A connection between FAS/FAE, attention deficit disorder with and without hyperactivity, conduct disorder and delinquency is suggested. Thus, although longitudinal data extending into adulthood are just starting to become available, consideration of the consequences of FAS/FAE points to the fact that it will clearly impact on the criminal justice system.

Infancy

During the first week of life infants may show excessive arousal, disturbed sleep patterns, gastrointestinal symptoms, hyperactive reflexes and other signs typical of withdrawal from a CNS depressant like alcohol. When FAS is identified in infancy there are a number of characteristic problems associated with fetal alcohol exposure including failure to thrive, delays in development, motor dysfunction and cardiac problems. Newborns also have regulatory problems and delays in acquisition of skills (Abkarian, 1992; Huebert & Raftis, 1996; Stratton, Howe & Battaglia, 1996). Many researchers have found that infants with FAS exhibited tremulousness, irritability, hyperacusis (low hearing threshold), disrupted sleep/wake cycles, weak suckle and feeding difficulties (Streissguth, 1997; Nanson & Hiscock,1990; Niccols,1994). Poor habituation is one of the earliest and strongest manifestations of CNS dysfunction associated with prenatal alcohol exposure. Habituation is an early sign of focussed attention, which enables the infant to avoid wasting energy on inconsequential aspects of their environment that are not directly related to their needs. The more alcohol reportedly consumed by the mother, the more poorly newborn infants habituated to light, rattle and a bell (Streissguth, Barr & Sampson, 1990). Streissguth et al. (1990) also found strong alcohol related attention effects on day one of life. Olson, Sampson, Barr, Streissguth & Bookstein (1992) confirmed similar findings in infants, as well as neonatal tremors along with significantly lower mental and motor development at eight months.

The main primary problems that are evident at this age are irritability, jitteriness, tremors, weak sucking response, problems with sleeping and eating, failure to thrive, delayed development, poor motor control and poor habituation.

Preschool Years

The preschool period is commonly defined as from 2 ½ to 6 years of age. Cognitive deficits are frequently observed and attention deficit disorder with and without hyperactivity is often identified. Preschoolers with FAS exhibit hyperactivity, friendliness and fearlessness, language dysfunction, perceptual problems and behavioural disturbances. During the preschool period, hyperactivity is present in 85% of children with FAS (Niccols, 1994; Stratton et al., 1996). Streissguth (1997) comments that some children with FAS/FAE are already out of control as preschoolers. They may show violent behaviour, fire-setting, marked hyperactivity and incorrigibility. Furthermore, they often display language delays, motor impairments, significant developmental delays and unusual sexual behaviour. A common occurrence is problems with attention, impulsivity, distraction and memory (Abkarian, 1992). These are all indicators for professional intervention. Huebert and Raftis (1996) concur with the previous findings and report that at four years of age, children exposed to alcohol prenatally have lower IQ, longer reaction time and other impaired behaviour.

Maternal alcohol consumption during pregnancy, even in "social" amounts, is associated with inattention and restless behaviour. Nanson and Hiscock (1990) found that "preschool children of social drinkers appear to display behaviour similar to preschoolers who go on to be diagnosed

as having attention deficit disorder (ADD)" (p. 656). This suggests that children diagnosed with attention deficit disorder may include a number of children whose cognitive impairment developed from exposure during pregnancy to social amounts of alcohol. In a comparison of children with FAS/FAE and attention deficit disorder, it was discovered that "FAS/FAE and ADD children, regardless of their intellectual abilities, were considered by their parents to be hyperactivity and inattentive in comparison to the parental judgement of normal children" (p. 658). However, it was also determined that on a laboratory measure of attention, children with FAS/FAE experienced more difficulty than did children with attention deficit disorder. More specifically, FAS/FAE children had difficulty with investment, organization and maintenance of attention over time, modulation of arousal to meet situational demands and with the inhibition of impulsive responses. The primary disabilities that appear to be manifest at this age are hyperactivity, attention problems, perceptual difficulties, language problems and poor motor coordination.

School-Age Years

The school age covers from 6 years old until 13 years of age. FAS/FAE children are described as unable to sit still in class and pay attention to school work. They have trouble dealing with multiple sensory inputs and significant problems in peer relationships. Furthermore, "beginning at school age, children have also been reported to "lack remorse," to fail to learn from mistakes, to lack judgement, to be unusually aggressive, and to be unable to maintain friendships" (Stratton et al., 1996, p. 163). Repeated failure, peer pressure and baiting, inability to understand

the demands of tasks and insufficient time to complete tasks can add to a vulnerable child's loss of control. Streissguth (1997) asserts that "the basic cognitive, attention, and memory problems of children, adolescents, and adults with FAS/FAE set the stage for behavior problems in the classroom and at home because of repeated failure to meet expectations" (p. 135). School-aged children with FAS/FAE have basic communication difficulties and trouble with self-reflection that makes verbal communication of their needs problematic. As well, they become overwhelmed by stimulation and unable to either respond appropriately or protect themselves from overstimulation of competing and ambiguous demands. They often have problems with number processing and abstract thinking.

Attention deficits. Many researchers have found that children diagnosed as FAS/FAE and those classified with attention deficit disorder with and without hyperactivity exhibit similar attentional deficits and behavioural problems (Huebert & Raftis, 1996; Kodituwakku, Handmaker, Cutler, Weathersby & Handmaker, 1995; Nanson & Hiscock, 1990; Niccols, 1994; Olson, Sampson, Barr, Streissguth & Bookstein, 1992; Shaywitz, Cohen & Shaywitz, 1980). It is important to note that the majority of these studies controlled for possible confounding cofactors such as maternal age, race, quality of child care environment, other drug use, smoking and parental education. O'Malley (1994) states that "the prenatal exposure to alcohol creates in some children an FAE picture which manifests itself in behavioral problems consistent with attention-deficit-hyperactivity-disorder (ADHD) and comorbid conduct disorder, explosive variety, or ADHD with comorbid mood disorder" (p. 1060). LaDue et al. (1992) assert that many of their patients with FAS/FAE "fit the diagnostic criteria for attention deficit disorder with

hyperactivity and for conduct disorders" (p. 128). Decrements in attention and in speed of central processing have been predicted by moderate prenatal alcohol exposure across the life span of these offspring up through the age of their last evaluation. Four types of learning problems were associated with moderate alcohol exposure in utero. Performance on arithmetic and reading tests as well as teacher ratings of classroom behaviour indicated these children were at increased risk for learning disabilities, parent ratings of behaviour denotative of learning problems, parent ratings of below average academic performance and placement in remedial classes and programs at school: "The implication that these learning problems stem in part from intrinsic, organic, attentional deficits can be drawn from the fact that alcohol-related decrements have been observable throughout the lifespan of these children, long before academic learning had occurred" (Streissguth, Barr & Sampson, 1990, p. 668).

Hyperactivity. Another behavioural phenotype that surfaces during the school years is hyperactivity. Sphor and Steinhausen (1987) assert that "hyperactivity is one of the cardinal symptoms of the syndrome and generally has a poor prognosis" (p. 17). Persisting hyperactivity and distractibility could be a significant contributor to poor educational performance. Shaywtiz, Cohen and Shaywitz (1980) discovered that hyperactivity was described in all but one of 15 children's (age 6.5-18.5 years old) school records.

Learning problems. Olson et al. (1992) followed a large cohort (n=462) of children from birth to age 11. They found that at age seven, arithmetic and spatial organization were affected, and that alcohol-related difficulties emerged in parental reports of learning disabilities and teacher reports of processing and organizational problems as well as memory difficulties. At age

11, alcohol-related effects emerged in teacher reports of signs of distractibility, restlessness, and lack of persistence as well as continuing reports of processing and reasoning problems. In this study, deficits at age 11 appeared dose-dependent, with increasing deficits in child performance associated with increasing maternal alcohol use. A further finding was that episodic binge drinking was related more to detrimental child classroom behaviour at 11 years than a measure of overall volume of alcohol consumption.

Information processing deficits. Huebert and Raftis (1996) comment that school-aged children with FAS may have severe information processing deficits, which results in problems with information input, integration, memory and output. In the classroom, information processing difficulties may be demonstrated by a child who: 1) appears to know something one day, forgets it the next, and then knows it again after several more days, 2) repeats exactly what they were asked to do, but still does not complete the task, 3) has trouble doing anything that involves arranging, sequencing, or taking turns, 4) repeats words, questions, or actions over and over. A potential problem is that cognitive deficits often go unnoticed in children with FAE or are mistaken for poor motivation.

Memory impairments. Further evidence for cognitive deficits in children with FAS comes from studies which have found that children with FAS have deficits in spatial memory, working memory, and language. Kodituwakku et al. (1995) discovered that 13-year-olds showed more difficulty than controls with planning and the manipulation of information in working memory. They propose the dysfunction in the ability to hold and manipulate information and to manage goals in working memory as the underlying cognitive mechanism responsible for impairments in

self-regulation. Conry (1990) evaluated a group of 17 Native American children, aged 5-16, with FAS or FAE. He discovered that these children showed deficits on specific abilities such as motor speed, grip strength, visual-motor integration and word comprehension. Children with FAS also demonstrated weaknesses in verbal learning and memory. More specifically, they had trouble with both immediate and delayed recall. The locus of memory impairment in the FAS group may be at the encoding level rather than at the retrieval level. It is relevant to note that "this encoding deficit may be alternatively related to attentional or impulsivity factors" (p. 814). Kodituwakku et al. (1995) endorse this viewpoint in stating that "attentional problems...typically have detrimental effects on other cognitive functions, especially memory" (p. 1558). Many, although not all, of the learning and memory deficits may be related to a global intellectual decline. West, Goodlett and Brandt (1990) assert that "the hallmark of CNS dysfunction accompanying FAS is intellectual deficiency" (p. 687). In light of this evidence, it may be useful for educators to understand that individuals with FAS/FAE may require additional assistance in learning but will be able to hold information once it is learned. It is important to keep in mind that the small sample size may limit the generalizability of these findings.

Communication difficulties. It appears that nearly every study on people with FAS or FAE reports a general discrepancy between the subject's ability to use verbal language and their ability to communicate effectively. Communication disorders often go unnoticed because of the small stature of children with FAS. Often, observers assume children to be younger than their chronological age. Children with FAS have reasonable social speech but they tend to ignore messages they receive. Because of their superficial conversational talent, adults may wrongly

assume that children with FAS have stronger linguistic skills than they actually do. Children with FAS/FAE also show a range of maladaptive social behaviours inconsistent with their chronological and mental age that interferes with their establishment of friends, and can lead to social isolation. As academic demands increase, teachers often report problems in staying on task, constant need for monitoring, tendency to distract classmates, negative social attitudes and stubbornness. Generally, children with FAS/FAE are described as intrusive, loquacious, and over-inquisitive, whereas they show a marked discrepancy between high verbal and ineffective communication skills. The combination of primary disabilities such as hyperactivity, attention deficits, learning disabilities, arithmetic difficulties, cognitive deficits, language problems and poor impulse control makes school-aged FAS/FAE children very susceptible to academic failure and future behavior problems.

Adolescence and Adulthood

Adolescents with FAS/FAE are thought to have significant deficits in intelligence, learning, academic achievement and social behaviour. These youth are at a much greater risk for substance abuse than others of this age group. Other characteristics involve persistent developmental and psychiatric problems (Stratton et al., 1996). Huebert and Raftis (1996) emphasize that "behavioural and psychopathological problems, which appear to increase in adolescence, are viewed by many as the most debilitating conditions afflicting these individuals" (p. 3). The majority of teenagers with FAS/FAE face increased failure and less satisfaction in academic classes, more social isolation, low self-esteem and depression. One concern is that the peer group

they attract may be unpredictable and a source of deviant behaviour, such as use of alcohol and drugs, out-of-control sexual activity, as well as violence and vandalism. It is common for adolescents with FAS/FAE to engage in inappropriate sexual advances that leave them open to victimization, rejection and prosecution (Streissguth, 1997). Abkarian (1992) agrees and contends that maladaptive behaviours persist in adolescence and adulthood, and naivete is coupled with sexual curiosity and lack of socially appropriate sexual behavior.

Primary Disabilities. Deficits subsumed under this category are those that the individual was born with and are directly due to prenatal alcohol exposure. Streissguth, Sampson, Olson, Bookstein, Barr, Scott, Feldman and Mirsky (1994) looked at attention and short-term memory in 14-year-olds, using close to 500 subjects from the Seattle Longitudinal Study on Alcohol and Pregnancy. They found that "prenatal alcohol exposure continues to affect the neurobehavioral functioning of young adolescents as it did in laboratory assessment at four years, and seven years and in an assessment of classroom behavior at 11 years" (p. 212). Tasks requiring more complex decision-making were the most sensitive in discerning the long-term effects of prenatal alcohol exposure. This study documents alcohol-related deficits in spatial memory, attentional processes and inhibitory problems. On the National Institute of Mental Health Attention Battery, the focus and sustain components of attention were most strongly connected to prenatal alcohol exposure. In summary, "the early adolescent consequences of prenatal alcohol involve response inhibition difficulties in complex problem-solving, poorer learning from experience in short-term recall of complex information, and fluctuating attentional states" (p. 214).

These results show a dose-response relationship where the likelihood of poor performance on attention/memory tasks clearly increases with increased prenatal alcohol exposure.

A number of researchers contend that other problems experienced in adolescence and adulthood are impulsivity, poor judgement, social-relationship problems, emotional problems, difficulty with organizational skills, difficulty in recognizing and setting boundaries, communication problems and abnormally increased and uncontrollable muscle movement (Huebert & Raftis, 1996; Kodituwakku, Handmaker, Cutler, Weathersby & Handmaker,1995; LaDue et al.,1992).

Adaptive Functioning. Streissguth et al. (1992) did a study of adaptive functioning of 61 adolescents and adults with FAS/FAE. The Vineland Adaptive Behaviour Scales, which measures daily living, socialization and community skills, were administered to the caregivers of the subjects. The results suggested that patients performed most poorly on socialization skills and best on daily living skills. The Vineland Adaptive Behaviour Scales showed that failure to consider consequences of action, lack of appropriate initiative, unresponsiveness to subtle social cues, and lack of reciprocal friendships were problems that were common to patients with FAS/FAE who were technically not mentally handicapped according to IQ scores. It appears that "the most frequent types of maladaptive behaviors noted were poor concentration and attention, dependency, stubbornness or sullenness, social withdrawal, teasing or bullying, crying or laughing too easily, impulsivity, and periods of high anxiety. In addition, many of the patients were noted to lie, cheat, or steal, to show a lack of consideration and to exhibit excessive unhappiness" (p. 1965). Overall, significant psychosocial problems and life-long adjustment

difficulties were characteristic of most of these patients. Average academic functioning of these adolescents and adults was at the early grade school level. A particular deficit in arithmetic skills was observed, which reflected their extreme trouble with abstractions and generalizing from one situation to another. Furthermore, "attentional deficits and problems with judgement, comprehension, and abstraction were the most frequently reported behavior problems...Conduct problems, such as lying and defiance, also characterized a number of these patients (62%)" (p. 1966). Recent longitudinal studies of FAS patients have discovered that conduct disorders persisted in 20% of these adolescents (Streissguth, 1997).

LaDue et al. (1992) studied 92 patients with FAS/FAE, with a mean age of 18.4. They had the subject's caretakers fill out the Vineland Adaptive Behaviour Scales as well as the Symptom Checklist. The Symptom Checklist was developed by LaDue et al. (1992) to examine psychosocial functioning (see Appendix A). In general, they found that abstracting and memory deficits were displayed in many areas, affecting not only academic performance but also daily living skills. IQ was not an accurate predictor of daily living skills for these patients as those with higher IQ functioned just as poorly as those with lower IQ. Patients did not function at a level that allowed independent living or self-sufficiency. The level of maladaptive behaviour was very high (58%). The findings indicate that "the symptoms most characteristic of adolescents and adults with FAS/FAE were attentional deficits (80%), memory problems (73%) and hyperactivity (72%)" (p. 115). Sexually inappropriate behaviour with others was reported for 31% of the patients. The male patients were more likely than the females to be involved in sexually inappropriate behaviour (38% vs.18%).

Secondary disabilities. In this category are disabilities that arise out of the interaction of the individual's primary disabilities and life experience. It is assumed that secondary disabilities can be prevented, reduced or eliminated with proper intervention. The problems of childhood and adolescence manifest themselves in a variety of ways in adulthood. Money management is a major difficulty and they often act impulsively and without consideration of consequences. They also remain extra-sensitive to sensory stimulation throughout their lives. LaDue et al. (1992) observe that as individuals with FAS/FAE get older, hyperactivity which is common in childhood, evolves into problems of easy distractibility, inability to attend to relevant data and inability to ignore irrelevant information. Adults with FAS/FAE may violate personal space conventions and use inappropriate and ineffective methods of trying to establish relationships. They may misperceive the intentions of others and are easily victimized.

LaDue et al.'s (1992) study on adaptive functioning also examined secondary disabilities. They comment that "the incidence of sexual misconduct leading to legal problems was higher in this population than might have been anticipated, with 13% of our patients being charged with some type of violation. Again, males (20%) were far more likely to have such complaints lodged against them than were females (4%)" (p. 116). The majority of the patients had truancy problems (53%), and this rate was almost equal for both sexes. As well, 25% reported past or current problems with drug abuse and 36% of the patients acknowledged alcohol abuse. There were no substantial gender differences in terms of drug use, but males abused alcohol at a higher rate than females. Furthermore, there seemed to be quite a large number of patients involved in criminal behaviours or problems with the law. The authors emphasize that "socially inappropriate

behavior has sometimes led to legal problems among outpatients with FAS/FAE The rate for petty larceny was 28%, and that for grand larceny was 4%" (p. 116-117). Other results indicated that: 27% of the patients had been involved in destruction of property, the drunk driving rate was high (23%), there was a high percentage of problems with lying (57%), stealing was observed in 35% of the patients and 46% of the patients had problems with defiance of authority.

Considering psychiatric illnesses, depression is the most common mental health problem, characterizing more than 40% of adults with FAS/FAE. Furthermore, 40% of adults and adolescents have made suicide threats and almost 25% have made suicide attempts (Streissguth, 1997). Stratton et al.(1996) emphasize that "the prognosis is poor and includes a higher risk for substance abuse, criminal behaviour, deteriorating mental health, and similar problems" (p. 166). The outcome for both FAS and FAE adults is disturbing. Streissguth (1988) compared the long-term outcome of 58 young adults with FAS to 34 young adults with FAE. Although the adults with FAS were significantly more impaired intellectually, there were no differences between the two groups in terms of their poor academic or social functioning. The mean IQ was 15 points lower for patients with FAS versus those with FAE. Therefore, "the long-term social consequences of FAE may be as severe as those of FAS" (p. 656).

An important 4-year study on secondary disabilities (Streissguth, Barr, Kogan, & Bookstein, 1997) provides more empirical evidence suggesting that the population of individuals with FAS and FAE are at heightened risk for involvement with the criminal justice system. Streissguth et al. collected information from 253 adolescents and adults age 12 - 51 with FAS (33%) or FAE (67%). A life history structured interview was given to the primary caregiver of the afflicted

individual to measure six secondary disabilities. The results showed that secondary disabilities were abundant. More than 95% had mental health problems (most frequently depression), more than 60% had a disrupted school experience (most frequently suspensions and then drop-outs), 35% had alcohol and other drug problems, and 49% had displayed inappropriate sexual behavior (most frequently sexual advances, then sexual touching, and promiscuity) . Sixty percent had been in trouble with the law, which was defined as ever being charged, convicted, or in trouble with the authorities for any of a list of criminal behaviors. Fifty percent had been incarcerated. Adolescents and adults were more likely to have been incarcerated than to have been in an inpatient mental health or alcohol and other drug treatment program. Thirty-two percent of adolescents and 42% of adults had been incarcerated for a crime, whereas 20% and 28% of adolescents and adults, respectively, had received inpatient treatment for a mental health problem and 12% and 20% of adolescents and adults, respectively had received inpatient alcohol and other drug treatments.

The extent of these behavior problems appears to be particularly associated with FAS/FAE and not to mental retardation in general (Streissguth, 1997). For example, criminality is not a typical behavior profile for people with Down's syndrome. One study comparing these two groups found that only 15-32% of adolescents with Down's syndrome had severe behavior problems, whereas 62% of those with FAS or FAE had significantly maladaptive behaviors (Harris, as cited in Streissguth & Randels, 1988). The maladaptive behaviors of individuals with FAS and FAE are clearly much greater than those of individuals with Down's syndrome.

Despite the high rates of criminality among people with FAS/FAE, it is important to note that their criminal activity appears largely impulsive rather than premeditated. (Streissguth, 1997). Streissguth (1997) suggests that their maladaptive behaviors (e.g., impulsivity, attention problems) and cognitive deficits (e.g., difficulty sorting out cause and effect, trouble understanding consequences) lead them into trouble with the law. Streissguth (1997) found that individuals with FAS/FAE with disrupted school experiences were over twice as likely to get into trouble with the law. The maladaptive behaviors of people with FAS/FAE are compounded by their problems with substance abuse, and become an increasing concern as they approach adolescence and have more time on their hands due to unstructured days resulting from disrupted schooling and unemployment (Streissguth, 1997).

The most frequent crime reported in this study was theft & shoplifting (Streissguth, Barr, Kogan, & Bookstein, 1997). However the researchers note that the whole gamut of criminal activity was represented to some extent. The most common sentencing alternatives were probation (46%) and community services (39%), and the most prevalent types of sentencing were juvenile justice (more than 60%) and juvenile detention (more than 40%).

Among the 253 people sampled in this study, higher rates of secondary disabilities were found among those who had FAE rather than FAS, behaviors more typical of the behavioral phenotype of fetal alcohol behaviors, and IQ scores above 70 rather than below.

There are many implications of these findings for the lives of adolescents and adults with FAS/FAE. Often, these patients have difficulty communicating their needs, being self-sufficient, maintaining their own hygiene, relating to their age mates appropriately, and applying for and

receiving social services. They are also easily led and manipulated by others and at risk for social, sexual and financial exploitation. Streissguth & Randels (1988) claim that "a goal of independent living is difficult to envision, considering this level of adaptive functioning" (p. 147). A major concern for caretakers of female patients is elevated risk of sexual abuse and/or pregnancy. Many of the higher functioning patients (IQ>80) are painfully aware of their deficits, to the point of understanding that they were caused by their mother's drinking during pregnancy. Researchers see a high level of depression, anger, suicidal ideation, antisocial behaviour and drug and alcohol use among these patients. Streissguth and Randels (1988) found similar results among their eight patients diagnosed with FAS whom they followed into adulthood. Surprisingly, the adults with the highest IQ were having the greatest trouble with life adjustment, and had the largest number of psychosocial problems. It is clear that the behavioural and social problems so often described in younger patients with FAS/FAE do not disappear, and new difficulties arise with physical maturation.

Risk and Protective Factors

There appears to be a number of risk and protective factors that can work to either buffer or exacerbate the effects of FAS/FAE. These factors can be linked with either a high or low level of what Streissguth (1997) terms "secondary disabilities". Secondary disabilities include disrupted school experiences, problems with alcohol and drugs, mental health problems, victimization, and trouble with the law. Streissguth (1997) has now extended her research to a four year study on secondary disabilities which involved 415 individuals (6-51 years old) with FAS (33%) or FAE

(67%). She administered the Fetal Alcohol Behavior Scale (FABS), which reflects the behavioural phenotype of typical fetal alcohol behaviours, to the caregivers of the subjects. She found that the main protective factors were: 1) living in a stable and nurturing home of good quality, 2) not having frequent changes of household, 3) not being a victim of violence, 4) having received developmental disabilities services and 5) having been diagnosed before six years of age. The risk factors were: having FAE rather than FAS, higher FABS scores rather than lower, and IQ scores above rather than below 70. It appears that having the more obvious syndrome (FAS) and lower IQ increases the probability of detection and early intervention which in turn has the effect of reducing secondary disabilities.

The home environment seems to be one of the major factors that can influence whether a child with FAS/FAE ends up with secondary disabilities. Huebert and Raftis (1996) remark that "many studies examining information on the background of children with alcohol-related birth defects suggest that there is a high degree of familial upheaval" (p. 20). They found that numerous children are never cared for by their biological mothers, many natural mothers die when the children are very young, and a high number live in multiple foster homes throughout their lives.

Being a victim of abuse or neglect seems to be fairly common in these children. LaDue et al (1992) used the Symptom Checklist and found that overall, 86% of the patients had been neglected, 52% had a history of physical abuse and 35% had a history of sexual abuse. As well, most of the subjects did not live with either biological parent (77%), 26% were in foster homes, 21% were with relatives, 16% were adopted and 9% were in group homes or institutions.
Ill and aging foster and adoptive parents are other environmental problems that can threaten the

home life of these children as they mature. Abkarian (1992) adds that children with FAS are likely to come from disrupted or dysfunctional families whose instability can worsen the child's intellectual and social delays. The continuity of the environment from birth is imperative for these children. They appear to suffer if they are changed from one environment to another.

Furthermore, it is important that the environment not only be continuous, but also calm and supportive (Olegard, 1988). Better social and emotional development appears to be related to stable home environments.

Unfortunately, even the best parents and loving homes cannot always prevent a child with FAS/FAE from developing further problems. LaDue et al. (1992) found that in day-to-day living, patients in tightly structured homes with attentive parents were able to minimize but not prevent or eradicate problems. Sometimes, academic, social and cognitive functioning is impaired in these individuals regardless of their diagnosis, IQ or residential placement. They assert that "although a positive environment can minimize problems and an unstructured environment puts patients with FAS at even higher risk, a good home does not always prevent the psychosocial difficulties experienced by so many of these patients, particularly those who remained several years in alcoholic households as young children" (p.129). Niccols (1994) notes that some children with FAS continue to exhibit developmental delay, even while being raised entirely by excellent adoptive families.

Abkarian (1992) observes that FAS/FAE is related to birth order with second, third, or later children being more likely to show symptoms. This may be related to maternal age, as well as continued or increased use of and tolerance to alcohol. Streissguth et al. (1990) also found that

alcohol effects were compounded by lower paternal education and a larger number of small children in the household. Overall, it is important to identify these risk and protective factors in order to inform intervention efforts and future preventative programs.

FAS/FAE and Delinquency

The link between FAS/FAE and delinquency may occur through a developmental pathway that begins with attention deficit disorder with or without hyperactivity, moves to conduct disorder and then manifests itself in delinquent behaviour (Oesterheld and Wilson, 1997). Independent of FAS/FAE, attention deficit disorder is linked to delinquency and crime. The following studies do not directly involve FAS/FAE children but they are still relevant for purposes of this review.

Follow-up studies of children with attention deficit disorder have shown that a significant number develop conduct disorder by adolescence. As well, studies of children and adolescents with conduct disorder concur about the strong predictive power of conduct disorder for future psychiatric disorders and social adjustment problems, antisocial personality, alcoholism and criminality (Biederman, Munir & Knee, 1987). Considering the poor outcome for children with attention deficit disorder, it is likely that the outcome for FAS/FAE children would be a parallel if not worse fate.

Delinquent children have certain predictors in common with FAS/FAE children. Farrington (1995) conducted a longitudinal study on 411 South London males, who were followed from age 8 to age 32. The main predictors at age 8-10 of later delinquency were: 1) hyperactivity-

impulsivity-attention deficit, including poor concentration, restlessness, daring and psychomotor impulsivity, 2) low intelligence and poor school attainment, 3) family poverty including low family income, large family size and poor housing, 4) antisocial child behaviour including troublesomeness in school, dishonesty and aggressiveness, and 5) separation from parents, poor supervision, parental conflict, poor parental child-rearing behaviour. These predictors would seem to describe FAS/FAE children as well.

Loeber (1990) has also studied the development and risk factors associated with juvenile antisocial behaviour and delinquency. He focuses on the fact that "antisocial children suffer from a disturbance in the development of impulse control" (p. 2). This lack of impulse control reflects a handicap in verbally mediated control over one's own behaviour. The main manifestations of disruptive and antisocial behaviour in childhood and adolescence are: 1) infant's difficult temperament, 2) hyperactivity, 3) overt conduct problems/aggressiveness recognized at age 2 or later, 4) social withdrawal, 5) poor peer relationships, 6) covert or concealing conduct problems, 7) association with deviant peers, and 8) delinquency and recidivism. Loeber (1990) notes that "antecedent risk factors associated with

later hyperactive/inattentive behaviors include exposure of children to neurotoxins such as lead, early malnutrition, low birth weight, and mother's substance use during pregnancy" (p. 8). FAS/FAE children definitely fit into this description of risk factors, and characteristically show hyperactivity and attention problems as the literature has demonstrated.

It is important to remember that not all children with FAS/FAE will follow this developmental pathway that starts with attention deficit disorder and ends in delinquency. Yet, many of the traits

describing these predeliquent children sound similar to the behavioural phenotype of FAS/FAE individuals, so they may represent a sub-group of the typical type of children who go on to become involved in antisocial behaviour. As noted earlier, much of the criminal behaviour typical of people with FAS/FAE appears to be the result of maladaptive patterns such as impulsivity, difficulty sorting out cause and effect and trouble understanding consequences. When they have time on their hands due to unstructured days, disrupted schooling, poor family supervision and unhealthy peer groups, and compound their problems with judgement with use of alcohol and drugs, they are more likely to get into problems with the law. Although more research is needed on this issue, it appears that even though children with FAS/FAE may progress along the same developmental course as other children who become delinquent, they may have different etiological reasons for their involvement in crime. These reasons must be considered in treatment, rehabilitation and supervision efforts.

In summary, it appears that a certain behavioural phenotype does characterize children with FAS/FAE as they progress from infancy to adulthood. The primary disabilities in infancy include irritability, jitteriness, tremors, weak suck, problems with sleeping and eating, failure to thrive, delayed development, poor motor control and poor habituation. In the preschool years, problems such as hyperactivity, attention problems, perceptual difficulties, language problems and poor motor coordination are common. Once a child with FAS/FAE reaches school-age the primary disabilities are hyperactivity, attention deficits, learning disabilities, arithmetic difficulties, cognitive deficits, language problems and poor impulse control. In adolescence the primary difficulties are memory impairments, difficulties with judgement, problems with abstract

reasoning and poor adaptive functioning. Some common secondary disabilities characteristic of adolescents and adults with FAS/FAE are being easily victimized, unfocused and distractible, difficulty handling money, trouble learning from experience, problems understanding consequences and perceiving social cues, poor frustration tolerance, inappropriate sexual behaviours, mental health problems and trouble with the law. These features may be one of the only ways in which individuals with this syndrome may be recognized, seeing as the physical phenotype often disappears as one matures. There are identifiable risk and protective factors which can affect the degree to which secondary disabilities are expressed. Common risk factors include poor home environment, abuse and neglect and familial upheaval. Some important protective factors are a stable and supportive home environment and not being a victim of violence. As well, there is a definite link between FAS/FAE, attention deficit disorder with and without hyperactivity, conduct disorder and delinquency. The link between attention deficit disorder and delinquency is clear in the literature, and this same developmental pathway can be expected in many FAS/FAE children who exhibit predictors such as hyperactivity, impulsivity, attention deficits, low intelligence, poor school achievement, antisocial child behaviour and poor parental child-rearing.

PART 3: FAS/FAE IN THE CRIMINAL JUSTICE SYSTEM

As explained in the previous section, children with FAS/FAE appear to be at increased risk of offending. Many of the behavioral features that are characteristic of children with FAS/FAE, such as attention deficits, hyperactivity, and impulsivity, have been shown in longitudinal studies to be predictors of delinquency and adult criminal behavior (Farrington, 1995). Although there is substantial evidence suggesting a link between FAS and crime, there is a dearth of research examining FAS/FAE in the criminal justice system. In fact, there are no known studies reporting the prevalence of FAS/FAE in prisons. Because children diagnosed with FAS in the early 1970's are only now reaching adulthood, much more is known about their childhood problems involving home and schools than their later adolescent and adulthood problems involving the criminal justice system.

Recently, some recognition of the problems with the criminal justice system faced by some individuals with FAS has been noted. In a report on individuals with FAS (Government of Canada, December, 1992, page 2), it is stated that "emotional instability and behavioral impassiveness often characterize their adolescent years, with some going in and out of custody for criminal offences". It is possible that children with FAE may actually be more likely to be involved with the criminal justice system later in life than are children with FAS because their symptoms are often not recognized (Streissguth, 1997) and they fail to get the help they need. Unfortunately, although individuals with FAE may be more likely to end up in prisons than

individuals with FAS, they are also probably more likely to go undetected within the criminal justice system.

It is clear that FAS and FAE are lifelong disabilities that are associated with high levels of distressing primary and secondary disabilities (Streissguth, 1997; Streissguth & Randels, 1988). The cognitive, social, and behavioral problems faced by individuals with FAS/FAE are believed to lead these individuals into trouble with the law, and then create further problems for them during incarceration. Although primary prevention of FAS/FAE is ideal, there is also need for interventions to reduce the physical, social, and psychological problems of those who have not escaped the effects of prenatal alcohol. The criminal justice system is one area where intervention efforts may be considered for adults with FAS/FAE.

In the third and final section of this report, we will examine the clinical implications of FAS/FAE in the criminal justice system in terms of 1) the potential of screening and diagnosis, 2) management and rehabilitation programs, and 3) risk management and aftercare following release.

Screening and Diagnosis

In order to plan an intervention for individuals with FAS/FAE, Stratton, Howe and Battaglia (1996) note that one must first identify the targeted population and assess their needs. Along these lines a recent government report recommended "Health and Welfare Canada, in cooperation with Provencal and territorial health departments, design and implement a research program to develop diagnostic procedures to identify adults afflicted with FAS and FAE. This research initiative shall be the first step in a comprehensive program to provide assistance to adults whose lives have been blighted by alcohol-induced injuries" (SADAC, 1992).

Streissguth (1997) has outlined a number of potential benefits of diagnosis. First, identification of individuals with FAS and FAE promotes visibility. Visibility helps alert individuals and services to be more aware and understanding of the behaviors affected by prenatal exposure to alcohol. Second, diagnosis of FAS or FAE identifies a cause. This allows for a better appreciation of behaviors that once seemed inexplicable and alters unrealistic expectations of FAS and FAE individuals. In addition, this encourages services to respond more appropriately and to set more realistic expectations that would allow the individual to feel a sense of accomplishment and self-worth rather than failure. Third, the identification and acknowledgment of adults suffering with FAS/FAE motivates the development of appropriate treatments and interventions. Recognizing FAS or FAE at intake and determining special needs facilitates effective treatment. Finally, diagnostic records can aid in further research on needs-assessment, program evaluation, and recidivism. Streissguth (1997) has suggested that criminal records should include, where available, notations about maternal alcoholism and diagnostic information on FAS and FAE. She also argues that a tracking system for those with FAS and FAE across multiple agencies would greatly improve the plight of individuals with FAS and FAE and would help ensure that appropriate social, educational, psychological, and medical interventions are made. Unfortunately, despite these potential benefit, there is as yet no agreed-upon method for diagnosing adults with FAS/FAE.

Potentially, identification can take place in two basic ways. One is that the individual has already received an early diagnosis of FAS/FAE, and the criminal justice system becomes aware of this through their own pre-sentence investigative screening. As medical personal become more

aware of FAS/FAE the availability of an early diagnosis is more likely. This would allow for the primary and secondary disabilities associated with FAS/FAE to be considered within all aspects of the criminal justice process (e.g., prosecution, conviction, sentencing, prison management, rehabilitation programs, parole supervision, and aftercare). Ideally, an early diagnosis would prevent an individual from becoming involved with the criminal justice system in the first place. In fact, research has shown that an early diagnosis (i.e., before the age of six) is associated with a lower rate of trouble with the law (Streissguth, 1997). It is suggested that this may be because an early diagnosis allows for better recognition of the special needs of FAS individuals and allows adaptations to be made to prevent or reduce secondary disabilities (Streissguth, 1997). Although not the focus of this report, FAS/FAE children would clearly be candidates for programs like Ontario's Better Beginnings.

Unfortunately, not all individuals with FAS/FAE are diagnosed early in life, and many may enter the criminal justice system without ever being identified. This leads us to the second basic way that identification can take place. That is, within the criminal justice system. Although diagnosing an adult is not as optimal as diagnosing an individual in early childhood, there are still many potential benefits. Identifying adults with FAS and FAE in the criminal justice system is the first step in assessing needs and eventually providing them better services (Spohr & Steinhausen, 1987). As Streissguth (1997) notes, if individuals with FAS/FAE can be identified early in the incarceration process, interventions may protect against more serious later criminal behavior and improve the management of these individuals during incarceration. Unfortunately, research suggests that community service agencies often fail to detect or diagnose FAS/FAE (Streissguth,

1997). The failure to recognize FAS as the primary diagnosis of individuals may result in misinterpretation of their secondary symptomatology and possibly inappropriate treatment during incarceration. This is especially true with FAE. Because their physical features are less apparent, individuals with FAE are less likely to be identified and therefore less likely to receive necessary services (Streissguth, 1997).

Screening for FAS/FAE in adult inmates will take considerable skill and resources as researchers and clinicians have yet to formally agree on screening and diagnostic assessment. Obviously, one of the major current needs is to develop a standardized screening procedure. At this point, the general strategy is to look for clues and follow up suspected cases with more formalized testing procedures. In all cases the assessor should first look for evidence that FAS/FAE has ever been suspected in the past and, if possible, obtain information from these sources. Clinical researchers, such as Streissguth (1997), suggest four key areas that need to be covered: maternal drinking history, physical features, cognitive functioning, and social-behavioral functioning. As a general guide history taking might be carried out along the lines of Streissguth's Symptom Checklist (see Appendix).

Maternal Drinking History. The interviewer should establish whether there is a history of maternal alcoholism dating back to child-bearing years (Streissguth, 1997). Specific information from family members or other informants regarding actual prenatal exposure (e.g. frequency of drinking, period of drinking, etc.) is not always possible, but is helpful. Circumstances such as a

history of child abuse or neglect, an alcohol-related maternal death, being raised by non-biological mother, and maternal illegal drug use, all raise the need for further questioning (Streissguth, 1997).

Physical Features. Diagnosing FAS/FAE based on physical characteristics is more difficult in adults. This is because facial features tend to normalize after puberty, making the facial features less distinctive (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991). Because facial features are more distinctive in children with FAS/FAE when they are between the ages of 2 and 14, it may be useful, although not necessarily practical, to examine preschool or early childhood photographs when diagnosis is suspected (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991; Streissguth, Moon Jordan, & Clarren, 1995). Earlier in this paper it was noted that Astley and Clarren (1996) had recently derived a photo analytic method that shows considerable promise as a screening and diagnostic tool. The physical features which best differentiate adults with FAS/FAE from those without are microcephaly, short stature, thin upper lip, smooth philtrum, and malformed or malaligned teeth (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991; Streissguth & Randels, 1988). Height and head circumference should be recorded and compared with normative charts. Signs of birth defects (e.g., joint problems, heart defects, cleft lips & palates), seizure disorders, developmental delays, gross or fine motor problems, and short palpebral fissures should also raise questions about the presence of FAS/FAE (Streissguth, Moon Jordan, & Clarren, 1995). Physical features that suggest the possibility of FAS/FAE should be followed with further probing regarding cognitive and social functioning.

Cognitive Functioning. Particular cognitive deficits have been found to be characteristic of adults with FAS and FAE. Studies examining structural and functional brain damage in adults with FAS and FAE are just commencing in this area (Streissguth, 1997). Because it has not yet been possible or practical to precisely measure the structural and functional impairments in the brain in groups of people with FAS/FAE, psychological tests have been used instead to provide a measure of their primary disabilities. Intelligence tests and achievement tests have been commonly used for this purpose.

Standardized IQ tests reveal a wide variability in presentation among adolescents and adults afflicted with FAS/FAE (LaDue, Streissguth, & Randels, 1992; Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991; Stratton, Howe, & Battaglia, 1996). In general, IQ scores for this population have been found to range from severely disabled to normal with an average IQ of about 70 (LaDue, Streissguth, and Randals, 1992). In addition, they found that performance IQ was higher than verbal IQ among those with FAS and FAE. This discrepancy suggests CNS dysfunction related to memory problems and abstracting abilities (LaDue, Streissguth, & Randals, 1992). These authors note that memory problems are observed in 73% of individuals with FAS/FAE. These abstracting and memory deficits are thought to have effects not only on academic functioning but also on functioning in daily life. Memory impairment may cause someone to have difficulty learning from experience, while difficulty with abstraction may create problems understanding consequences.

Condry (1997) has observed that it may seem surprising that their IQ scores are at this level, because often their superficial language skills make them appear to be more competent than they really are. Research using the Peabody Picture Vocabulary test reveals that individuals with FAS/FAE have poor receptive language (LaDue, Streissguth, & Randals, 1992). Thus, they may have trouble understanding and interpreting meaning from information presented aurally. More research is needed to examine the specific language deficits among this population.

The wide variability in scores on intelligence tests makes it difficult to use IQ tests for the diagnosis of FAS/FAE. Clearly, mental retardation is not a defining feature of FAS (Streissguth, 1997). In assessing for FAS/FAE, researchers caution that it is important to keep in mind that measures of these individuals' IQ's do not correlate well with measures of their adaptive behaviors (Streissguth, 1997). Thus, an individual with FAS/FAE who has an IQ in the normal range may still have significant trouble living independently in adulthood.

IQ scores of individuals with FAS/FAE are also not very good predictors of their academic achievement (LaDue, Streissguth, & Randals, 1992). When tested with the Wide Range Achievement Test-Revised, researchers have found that on average their academic functioning was at the grade 2 - 4 year levels (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991; Streissguth & Randels, 1988). Their arithmetic achievement was considerably lower than would be predicted from their IQ scores. In contrast, spelling and reading achievement were found to be within the predicted range. Arithmetic deficits are often cited as problems faced by individuals with FAS/FAE (Streissguth, 1997). These difficulties with arithmetic are thought to be a strong contributor to their problems with independent living and money management (Streissguth,

1997). The high rates of disrupted school experiences (e.g., suspensions, drop-outs) reported among individuals with FAS/FAE (Streissguth, Barr, Kogan, & Bookstein, 1996) may be both contributors and consequences of their academic difficulties.

More research on the cognitive impairments of adults with FAS/FAE is badly needed. Although by themselves, IQ tests, achievements tests, and neuropsychological test batteries such as the Halstead-Reitan (Dyer, Alberts, & Neimann, 1997), can not provide a diagnosis of FAS/FAE, they can help to isolate specific deficits and provide estimates of cognitive functioning.

Social and Behavioral Functioning. The areas of most concern reported by caretakers and clinical observations of adults with FAS and FAE are adaptive and social functioning (LaDue, Streissguth, & Randals, 1992). It was noted that these adults did not appear to be functioning at a level that allows for self-sufficiency and independent living (LaDue, Streissguth, & Randals, 1992). The Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Ciccheti, 1984) is a test that is useful for documenting and quantifying adaptive functioning, and is often used with populations with developmental disabilities. This test is usually administered to caregivers and is composed of three subscales (i.e., daily living skills, socialization, and community skills). The test yields standard scores and age equivalents for each of these subscales as well as an adaptive behavior composite score, which is useful in predicting long-term functional abilities of individuals. In addition, there is the VABS Maladaptive Behavior Scale, which provides a measure of various forms of maladaptive behaviors and yields a score and categorization level of significant, intermediate, or nonsignificant maladaptive behaviors.

Using the scale on a sample of 92 adolescents and adults with FAS/FAE, LaDue, Streissguth, & Randels (1992) found a very low overall level of adaptive functioning, much below the person's chronological age. This was surprising because these individuals often appeared very alert and verbal on clinical examination. On average, written and verbal communication skills and expressive and receptive language, were at the level of an 8-year old and scores on the daily living skills subscale at the level of a 9-year old. This scale measures more repetitive and concrete skills such as hygiene, money use, time, and job skills. Individuals did worst on the socialization domain, with the average score at the level of a 7-year old. This scale measures skills that are more abstract and subtle, such as interpersonal skills and ability to follow social rules and conventions. No differences were found on adaptive behaviors between those with FAS and FAE. Clearly, poor adaptive behavior is characteristic of this population, and as some researchers have suggested may be their most handicapping disability (Streissguth & Randels, 1988),.

As noted earlier in this review, this study showed an alarmingly high level of maladaptive behavior among this population (LaDue, Streissguth, & Randals, 1992). The majority (58%) had average scores falling within the 'significant' level of maladaptive behaviors. The most common maladaptive behaviors were attention/concentration deficits (77%) and impulsivity (57%). Other maladaptive behaviors which may be associated with their increased involvement with the criminal system are teasing/bullying (53%), lying, cheating, or stealing (49%), engaging in inappropriate sexual behavior (21%), being negativistic or defiant (43%), intentionally destroying own or another's property (25%), and being physically aggressive (19%). Further, a significant proportion of the sample had legal problems for sexual misconduct (13%), petty

larceny (28%), grand larceny (4%), vandalism (27%), drunk driving (23%), and stealing (35 %). Clearly, the level of maladaptive behaviors among this population is high, and present a great challenge to the management of these individuals as adults (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991).

Another test that might be considered as a screening tool for FAS/FAE is the Fetal Alcohol Behavior Scale (FABS; Streissguth, Barr, & Press, 1996). This test is given to caregivers and measures the proposed behavioral phenotype of typical FAS/FAE related behaviors. Although further research is needed to determine the utility of the FABS as a screening tool for FAS/FAE, research to date suggests that the average individual with FAS/FAE is characterized by three times as many of the 36 FABS items as the average individual without known fetal alcohol damage (Streissguth, 1997). Preliminary research using this scale suggests that some of the more common items in the behavioral phenotype for FAS/FAE center around difficulty modulating incoming stimuli (i.e., poor habituation), and poor cause-and-effect reasoning, especially in social situations. Thus, individuals with FAS/FAE are likely to get overstimulated in social situations, overreact to situations with strong emotional reactions and to display rapid mood swings set off by seemingly small events. Their trouble in social situations is suggested by their unawareness of the social consequences of their behavior, poor judgment in whom to trust, and need to be the center of attention.

The Life History Interview (LHI; Streissguth, Barr, Kogan, & Bookstein,1997) is another tool that has been used to examine secondary disabilities across the life span. This is a 70 minute, 37 page comprehensive structured interview designed to measure six categories of secondary

disabilities. These include mental health problems, disrupted school experiences, trouble with the law, confinement, and alcohol and drug problems. It also measures environmental and intrinsic protective and risk factors. Although this interview may be useful for understanding some of the special problems faced by these individuals, there is no data yet on the utility of this interview as a screening tool for FAS/FAE.

To go beyond screening a medical specialist (dysmorphologist or expert in medical genetics) is required, but any information gathered during screening would be highly useful in arriving at a definite diagnosis of FAS/FAE.

Issues in Identification and Diagnosis

One of the issues that arises in diagnosing individuals with FAS/FAE is that many of these individuals often fit the diagnostic criteria for other disorders such as ADHD, conduct disorders, and substance abuse disorders (LaDue, Streissguth, & Randals, 1992). It is important to identify a dual diagnosis of alcoholism and FAS because those with FAS/FAE who are also severely dependent may suffer additional neuropsychological impairment. Additional deficits that have been noted in chronic abusers of alcohol are in the area of memory, attention, new learning, visual-spatial skills, concept formation, cognitive flexibility, set shifting, problem-solving and ability to follow complex demands (Tonneato, 1997). It is important in diagnosing these individuals to be aware of the dual diagnosis of FAS/FAE with other disorders so that a more successful intervention can be planned (Streissguth, Moon Jordan, & Clarren, 1995).

Researchers have emphasized the importance in considering other biological syndromes in the differential diagnosis of FAS/FAE (Mueller, 1991). Clinical evidence suggests that a definite

diagnosis of FAS/FAE may be difficult to confirm or to differentiate between other syndromes (e.g., XYY syndrome) without the use of chromosomal analysis (Mueller, 1991). Because there are children with phenotypes that look similar to FAS (such as those with Blume syndrome, or Dubowitz syndrome and various other conditions), no absolute diagnosis of FAS is possible with out the fully defined physical appearance (Streissguth, Clarren, Randels, LaDue, Aase, & Smith, 1991). This is true even when a child has a positive maternal history for prenatal alcohol exposure (Streissguth, Clarren, Randels, LaDue, Aase, & Smith, 1991). Although some neuropsychological tests have shown some promise in differentiating between individuals with FAS and ADHD (Mirsky, 1989, as cited in Stratton, Howe, & Battaglia, 1996), it is clear that more research on differential diagnosis is needed. Undoubtedly, there are difficulties with syndromal diagnoses, especially retrospective ones, that limit the possibility of making a definite diagnosis of FAS/FAE in adults (Streissguth, Clarren, Randels, LaDue, Aase, & Smith, 1991).

A related problem is the distinction between FAS and FAE. If the diagnostic criteria are too restrictive, only individuals with clear cases of FAS would be identified. This would clearly be problematic, because the behavioral and functional impairments associated with FAE can have long-term consequences that can be as severe as those with FAS (Conry, 1997; Huebert , & Raftis, 1996) . Because the physical features of FAE tend to be more subtle than FAS, but the social, behavioral, and neurological deficits just as devastating (Conry, 1997), it is not accurate to view FAE always as a milder form of FAS that deserves less recognition or treatment.

Because FAS was only identified in the last 25 years there is a huge gap in our knowledge and ability to diagnose adults with FAS/FAE. Caution must be taken in identifying this population

because of the uncertainty of the screening tools. It is clear that identification by facial features is problematic in adulthood (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991), and that identifying by physical features alone would exclude many of the individuals with FAE. One must be cautious and eliminate other possible causes before making a diagnosis of FAS/FAE (Spohr & Steinhausen, 1987). In addition, it is very important to assess adaptive behavior of a suspected individual because IQ scores do not correlate well with adaptive behavior nor do they provide an indication of their success at living independently. Another caution in administering and interpreting IQ tests is that one must be careful not to interpret a higher performance IQ as a definite indication of CNS dysfunction, because there is data to suggest that performance IQ is often higher than verbal IQ in Native people (Spohr & Steinhausen, 1987). Because of the great variability in alcohol-induced damage, the problems with retrospective diagnosis, and the various other teratogenic and environmental agents that may interact with alcohol-related birth defects, one must use caution in making any firm diagnosis of FAS/FAE. Clearly, a formal diagnostic procedure and further research on the impairments faced by individuals with FAS/FAE are needed before any rational intervention or therapy can be carried out efficiently and effectively (West, Goodlet, & Brandt, 1990).

There is also the issue of labeling that is frequently raised in the context of identification and diagnosis. There are two sides to this argument. Some feel that a diagnostic label can provide a relief to the individual and their family to understand the specific etiology of their lifelong disabilities (Streissguth, Aase, Clarren, Randels, LaDue, & Smith, 1991). In addition, a label can be helpful to counselors, staff, and others who can attempt to better understand the difficulties

faced by the individual and to work around their cognitive and social deficits. Finally, a label can allow for the access of particular services or benefits that could be helpful in providing the individual with a fairer opportunity to function productively in life.

The argument against labeling is centered around various risks and harms. Some argue that labels can carry a stigma which can have serious emotional and social repercussions (Spohr & Steinhausen, 1987). These labels may further stigmatize already stigmatized groups, such as Aboriginals. Also, it is feared that a misdiagnosis or unfounded labeling could result in an unnecessary burden on caretakers, create guilt in the mother, provide an excuse for behaviors that may be explained by environmental factors, and result in overlooking other possible causes (Spohr & Steinhausen, 1987). Some feel that diagnosing someone with FAS/FAE is a problem because it assumes that prenatal exposure to alcohol is the major cause of the adults' problems, thus removing blame and terminating the search for other causes (Spohr & Steinhausen, 1987). It is important that one carefully weigh the pros and cons of labeling and that the decision of whether or not to label someone with FAS/FAE is based on the individual's best interest.

Some have suggested that rather than label a person with FAS/FAE, we label the specific problems the person has (Spohr & Steinhausen, 1987). It may be more practical to label individuals' specific learning problems (e.g. arithmetic disability, difficulty abstracting), attention problems (e.g., ADHD), and behavioral attributes (e.g., impulsive, poor self-regulation, substance abuse, anger problem, etc.) (Spohr & Steinhausen, 1987). These labels provide more specific information about the impairments faced by the individual and a better indication of how to treat the individual. If this method of labeling were to be used in the criminal justice system to identify

the problems of each inmate, then programs could be tailored not only to individuals who are diagnosed with FAS/FAE, but to any individual who suffers from these particular disabilities.

This alternate form of labeling has several potential benefits. Some argue that qualifying for special services or programs in the criminal justice system should be based on demonstrated need as opposed to diagnoses, such as FAS/FAE. Thus, all individuals should be given psychological, behavioral, and intellectual tests at intake to obtain information about needed services. If we overemphasize the importance of an FAS/FAE diagnosis and under emphasize the behavioral and learning problems of adults in general who are in the criminal justice system, we may overlook those who do not qualify for a diagnosis but who desperately need assistance. Should access to special treatment depend on whether a person's disabilities are caused by exposure to teratogenic agents prior to birth and neglect those who were exposed to harmful agents from their postnatal environments? Many of the common impairments found among individuals exposed to prenatal alcohol, such as attention deficits, hyperactivity, learning disabilities, conduct disorders, and other behavioral problems, have also been found among those who have been exposed to poor postnatal environments, such as children of alcoholics (Conry, 1997). These issues must be considered in developing policies and interventions.

Recommendations

- That the criminal justice system consider initiating its own pre-sentence investigative screening to determine if the individual in question has ever received a diagnosis of FAS/FAE. A positive identification would allow for the primary and secondary disabilities associated with FAS/FAE to impact on all aspects of the criminal justice process from

prosecution to parole release. FAS/FAE individuals are definitely at increased risk for coming in contact with the criminal justice system and as medical personal become more aware of FAS/FAE the availability of an early diagnosis is more likely.

- It is likely that cases of FAS/FAE continue to enter the prison system unrecognized. Correctional Services Canada might consider developing a practical screening instrument for identifying suspected cases of FAS/FAE early in the incarceration process or acquiring such an instrument if one becomes available elsewhere. The Offender Intake Assessment currently used by Correctional Services Canada may prove to be a good starting point. What is needed is research that would determine if identifiable cases of FAS/FAE can be distinguished from patterns shown by the general population of offenders on this instrument. Alternatively, Streissguth's research group in Seattle, Washington has made considerable progress using a variety of instruments such as the Vineland Adaptive Behavior (and Maladaptive Behavior) Scale, the Fetal Alcohol Behavior Scale, the Symptom Checklist and the Life History Interview supplemented with IQ and cognitive testing. Advances in photo identification are also promising. Suspected cases of FAS/FAE can be refereed to a medical specialist for formal diagnosis.
- For reasons mentioned earlier in this paper, diagnosing adults with FAS/FAE is currently a difficult feat. As an alternative to diagnosis, Correctional Services Canada might direct its screening efforts at identifying inmates' specific learning problems (e.g. arithmetic disability, difficulty abstracting), attention problems (e.g. Attention Deficit Disorder), and behavioral attributes (e.g. poor self-regulation, substance abuse) along the lines suggested

by Spohr and Steinhausen (1987). This strategy also provides specific information about deficits and problems and can be very useful not only with those diagnosed with FAS/FAE, but to any inmate who is experiencing these difficulties. Thus, any services or programs offered to inmates would be based on identified need rather than diagnosis. In some ways this strategy would be an extension to the screening and assessment that CSC currently carries our with such batteries as the Computerized Lifestyle Assessment Inventory.

- If screening and diagnosis or screening for FAS/FAE related problems proves feasible, we recommend a computerized data base be instituted This data base should prove valuable for research purposes, for institutional programming, and for risk management after release from prison.

Institutional Management and Rehabilitation Programs

Awareness and Management. Recognition of individuals with FAS/FAE in the criminal justice system and an awareness that these individuals have had damage to the brain which has medical, social, and behavioral consequences, is an important step in intervention (Spohr & Steinhausen, 1987). In a recent government report (Government of Canada, December, 1992, p. 31), it is stated: "It is hoped that improved awareness, on the part of social service and criminal justice agencies of the kinds of disabilities typically experienced by children and youth affected by FAE/S, may increase sensitivity to the existence of FAE/S adult clients or offenders. This improved awareness by service providers can be facilitated by way of informational materials and in-service-training workshops. Organizations concerned with assisting the learning disabled could

act as a focal point for distinguishing FAE/S-affected individuals from those with other types of disabilities. Within the juvenile justice area, future initiatives, including any public and professional education packages that may be developed to bridge health and justice issues, would include references to FAE/S."

In an unpublished study described by Streissguth (1997), in a Washington State prison, it was discovered that the profile of behaviors characteristic of adults with FAS/FAE was well known to the corrections officers and counselors. However, they were unaware that there was a name for this profile, and that it was associated with brain damage caused by prenatal alcohol exposure (Streissguth, 1997) . This suggests that those working with inmates who have FAS/FAE should be given information and training about FAS/FAE to help them to better understand and deal with this population (Spohr & Steinhausen, 1987).

An awareness that individuals afflicted with FAS/FAE have damage to the brain that causes behavioral and developmental disturbances would likely lead to more realistic performance expectations for these individuals. It might also change the attributions given to their maladaptive behaviors and the ways that these behaviors are managed. Thus, rather than inferring that these individuals are unmotivated, manipulative, or self-defeating, staff may be able to see that their maladaptive behaviors are the result of neurological impairments caused by fetal alcohol-associated brain damage. If staff learn to recognize that primary symptoms (e.g., memory problems, disorientation in time and space, impaired judgment) arise from prenatal alcohol exposure, they may be less inclined to label them negatively. This awareness may encourage staff to be more patient and supportive with these individuals, and to provide them with the attention,

structure, and assistance that they need. In turn, this may reduce various management problems (Streissguth, 1997).

Based on her experience with FAS/FAE children, Streissguth (1997) has observed that they work best in an uncluttered environment where there is order, structure and predictable routines. Establishing clear consistent rules and giving instructions in a simple concrete fashion works best. The same should be true of adults with FAS/FAE. Its of interest that adults who have experienced severe brain injuries also appear to function best in appropriately structured environments (SADAC,1992). Streissguth also notes that supervision with constructive feedback can reduce frustration and confusion in FAS/FAE individuals. Similarly, because of their poor habituation and tendencies to become over stimulated, FAS/FAE individuals benefit from environmental arrangements that help control and modulate sensory inputs (Streissguth, 1997). To the extent that these factors can be taken into consideration, FAS/FAE inmates will likely be easier to manage.

Because of the special needs of individuals afflicted with FAS/FAE, Streissguth (1997) suggests that an institutional advocate should be designated for these individuals immediately after their arrival to the institute. An advocate is someone who understands the nature of FAS/FAE, is aware of the individuals strengths and limitations, and works with the individual to help them function most effectively. Although individuals with FAS/FAE may adapt relatively easily to the structured environment of the institution, they may have great difficulty with the close interpersonal interactions that take place in a confined setting (Streissguth, 1997). Their tendency to become easily overwhelmed in social situations may result in troubling incidents and their tendency to be overly trusting of others may result in victimization or trouble making.

According to the results of a functional analysis reported by Dyer, Alberts, and Niemann (1997), disruptive behavior is more likely to occur when staff attention is reduced, when there are too many distractions in the environment, and when structured programming is not in place. Brain damage of the type typically associated with FAS/FAE is most likely manifest in "complex" and minimally structured situations which require imposed order and meaning in order for the person to behave adaptively. Thus, individuals with FAS/FAE are likely to require close monitoring to keep them out of trouble. An advocate may work to ensure that proper monitoring and structure is provided for such individuals and this in turn might help reduce the occurrence of negative incidents.

Recommendations

- The criminal justice system and CSC in particular might consider designing an FAS/FAE Awareness Manual and implement in-service training at all levels in order to educate and raise awareness about this condition. Program officers and psychologists might be considered for more in depth training about FAS/FAE and eventually take over the role of increasing awareness in other personnel, such as parole and classification officers.
- Should a sufficient number of FAS/FAE offenders be identified at a particular institution, CSC might consider appointing an advocate, such as a program officer very familiar with FAS/FAE, to help manage their behavior and look after their best interest. Such an advocate would also be an excellent candidate for looking after FAS/FAE awareness programs.

Rehabilitation Programs. An increased awareness of the permanent neural deficits implicated in the etiology of FAS does not rule out the need for psychological intervention (Niccols, 1994).

Treatments are needed to reduce maladaptive behaviors and decrease secondary disabilities so that the highest possible level of functioning can be attained. The costs of these harmful behaviors and disabilities to both individuals and to society are great. The high rates of depression, substance abuse and suicide attempts among this population suggest that the personal consequences of this disability are severe (Streissguth, 1997).

As of 1998, there is no known formalized treatment program for adults with FAS/FAE nor any strong empirical evidence suggesting that any particular treatment modality is more effective than any others (Streissguth, 1997). This conclusion also applies to the use of psychotropic drugs with this population (Stratton, Howe and Battaglia, 1996). Also, given the multiple different problems that these individuals exhibit, it is difficult to comprehend a single treatment program meeting their needs.

There is little doubt that the treatment programs that CSC has developed to meet the needs of their offender population in the areas of social and life skills, cognitive skills, anger management and substance abuse will be needed with FAS/FAE offenders. The major question is -**Are programs targeting these problem areas delivered in a format that is suitable to FAS/FAE offenders?** In the absence of research that directly addresses this issue we can only base our answers on what we know about FAS/FAE and what clinicians who work with FAS/FAE have observed.

We know from the findings covered earlier in this paper that they will likely need a great deal of help with basic social and life skills as their adaptive functioning is very poor. Most do not appear to function at a level that allows independent living. Attention deficits, impulsivity and memory

problems will make it difficult for them to acquire or hold employment and to achieve stable living. They show poor judgement and are at risk for victimization. They have difficulty learning from experience and their arithmetic disability leads to problems handling money, paying bills, etc. Their problem solving is at a very low level.

Similarly, their impulsiveness often gets them into trouble, they have poor tolerance for frustration and anger problems are frequently reported. Most likely anger management programs will be salient to their needs.

Difficulties with abstraction leads to problems understanding consequences and their general disorientation makes it difficult for them to perceive social cues or take the position of another person. Even when their intelligence is in the normal range their thinking is confused and characterized by cognitive errors. Thus cognitive skill training would be useful.

There is a high rate of substance abuse in this population and this problem often makes other problems worst. Substance abuse treatment will clearly be needed.

Sexually inappropriate behavior is common and will also have to addressed. In addition, many have psychiatric problems such as depression that will require attention.

It is obvious that FAS/FAE offenders, whether male or female, are multi-problem individuals with few resources and many deficits and needs. Treatment will likely be difficult and without a great deal of support and supervision the prognosis is likely to be poor.

Since adults with FAS/FAE are just now starting to be studied little is know about how to treat them or their response to treatment. Some of the suggestions for treating adults with FAS/FAE come from treatment programs used with children with FAS/FAE and from those used with

mentally handicapped adults. The most obvious feature of these programs is the strong use of structure and the use of simple concrete instructions (Streissguth, 1997). Early targets for intervention should include basic life skills including communication, social skills, organizational skills such as managing time money and recreation, and possibly anger management (Spohr and Steinhausen, 1987).

Regardless of problems targeted, any treatment expected to be at all effective must consider the cognitive deficits faced by this population. Individuals with FAS/ FAE will have serious limitations on their abilities to understand, interpret, and remember information presented in typical treatment formats. They are likely to forget material from earlier sessions, have trouble applying abstract concepts to real life situations, and have difficulty reasoning by analogy or problem solving (Tonneato, 1997). Given these deficits program facilitators will have to work in a very concrete fashion with a great deal of repetition (Condry, 1997). Streissguth (1997) suggests that therapists who have experience working with developmental and learning disabilities may be preferable for treating this population.

Insight oriented therapies are definitely contraindicated with this population. Instead, very practical directive strategies should be used. Novick (1997) suggests that cognitive-behavioral with a strong component of interpersonal skills training is helpful for individuals with FAS/FAE because it is more concrete, directive and skills-based than other therapeutic approaches. Such an approach has proven useful in treating impulsivity in children and adolescents (Farrington, 1995) and may be applicable to adults as well.

The general content of major programs offered by CSC, such as social and life skills, cognitive skills, anger management and substance abuse programs like the Offender Pre-release Substance Abuse Program (OSAPP; Lightfoot, 1989) are clearly appropriate to inmates with FAS/FAE. However, it is likely that the content of these programs will have to be simplified, made very concrete and redundant with frequent reviews in terms of presentation. The pace of presentation should allow plenty of time for practice and repetition (Tonneato, 1997). Regular daily sessions would be helpful, however, because of attention deficits these sessions should be shorter in duration than the typical all-day format used in many CSC programs (Streissguth, 1997). Intensive learning or crammed learning would be counter productive (Tonneato, 1997). Such individuals might also benefit from memory enhancement techniques, such as chunking material into more manageable components and utilizing visual imagery and cues cards to enhance recall (Tonneato, 1997).

Group size is also important. Because individuals with FAS/FAE are easily overwhelmed by excessive social stimulation and easily confused by tasks they have difficulty understanding, Streissguth (1997) recommends that treatment should be carried out in very small groups, or one-on-one.

Special attention may be needed for those with substance abuse problems, which are more frequent in males than in females and in those with FAE than in those with FAS (Condry, 1997; Streissguth, Moon-Jordan and Clarren, 1995). There is some evidence that individuals who are mentally handicapped and who also have alcohol problems engage in many more disruptive behaviors than those without alcohol problems (Westermeyer, Phaobtong, and Neider, 1998, as

cited in Streissguth, Moon-Jordan and Clarren, 1995). Condry (1997) and others have noted that serious alcohol problems can worsen the cognitive deficits (e.g. memory deficits) of individuals with FAS/FAE and reduce their ability to cope.

It is important for counselors working with substance abusing FAS/FAE inmates to understand the behavior patterns resulting from their cognitive deficits. Streissguth et al (1995) note that it is easy to misinterpret their behavior and accuse them of being manipulative or in denial. Cognitive confusion, resulting in missed appointments, can be misinterpreted as intentional and these attributions can trigger punishment and staff retaliation, rather than increased support and care.

Insight oriented treatments have a poor record in the field of substance abuse (Hester and Miller, 1995) and are definitely not recommended for substance abusing individuals with FAS/FAE (Streissguth, 1997). Given the nature of FAS/FAE, simplified, highly structured, real- life problem solving approaches along the lines discussed earlier are likely to be most beneficial with this population.

Since there is no research documenting the effectiveness of any particular treatment over any other, any program designed specifically for FAS/FAE offenders, whether for substance abuse or any other problem area, should be carefully evaluated.

Because of the high rate of depression, suicide dangers and other psychological problems in FAS/FAE individuals, provision also has to be made for therapy to deal with these problems (Streissguth, 1997). Such therapy should be carried out on an individual basis by psychologists and psychiatrists familiar with FAS/FAE and the general guidelines for treatment with this population noted earlier.

Recommendations

- Provided that inmates with FAS/FAE can be identified, CSC might consider designing and evaluating a special institutional program for this population that takes into consideration their specific cognitive deficits and behavioral patterns. The suggested strategy would be to modify existing, well recognized programs in the areas of social and life skills, cognitive skills, substance abuse and anger management in the direction of making them more structured, concrete and repetitive, allowing more time for review and practice, and presenting material in shorter but regular segments. One strategy for accomplishing this may be to ask the original authors of these programs to consult with others who have expertise in FAS/FAE and/or expertise in working with developmentally handicapped or brain damaged adults. Also, given the high proportion of Aboriginals with FAS/FAE and their similar over representation in the criminal justice system, it may be useful to consult with a culturally sensitive expert in this area.
- Programs should be carried out in small groups by facilitators who understand the cognitive and behavioral deficits of FAS/FAE individuals.
- Treatment of psychological problems, such as depression and suicide ideation are best dealt with in individual therapy by psychologists or psychiatrists with knowledge of FAS/FAE patterns.

Risk Management and Aftercare. Just as FAS/FAE individuals need extensive programming within the institution for their multiple problems, they are likely to need extensive help and careful

monitoring after they are released on parole. Because these individuals have great difficulty living independently, aftercare should be extended as long as possible.

Housing arrangements that allow them to set up a simple, structured lifestyle under fairly close monitoring would probably work best. It would be important for caretakers and monitors to understand the deficits and problems that FAS/FAE individuals are likely to experience as they will need a good deal of support and understanding rather than limit setting and over-reaction.

Extensive social and life skills training should ideally take place close to their release date, and if possible, continue after they are released. CSC might work closely with community social services agencies to ensure job skills training. Jobs that are straight forward and routine with appropriate supervision would be best.

New challenges encountered on release are likely to be stressful and confusing. As far as possible, careful planning should be in place prior to release and inmates should be well coached to prepare them for the transition. Parole officers with special training should partly take on the role of advocate, maintain close contact with their FAS/FAE charges, help with problem solving, and provide support and encouragement in stabilizing these individuals in the community, especially first few months of release.

For those with substance abuse problems a post-release relapse prevention and maintenance program would be very valuable. However, the CSC program that targets this period-the CHOICES Community Correctional Brief Treatment, Relapse Prevention and Maintenance Program (Lightfoot and Boland, 1992)-would be too intensive and require too much cognitive processing for FAS/FAE inmates. The program would have to be redesigned along the lines

considered earlier for this population. However, the three month maintenance component of the CHOICES program would clearly be of value, especially if it was bolstered by a strong problem solving approach. This would specifically address crises and problems encountered by FAS/FAE individuals that were likely to impact on their substance use goals. If such a program proved feasible, the maintenance period might be extended to six months or a year, especially in larger centers. Throughout the process, close liaison should be maintained between parole officers with FAS/FAE charges and maintenance program facilitators as problems that arise may need the cooperation of both parties.

Successful risk management and re-integration of the individual into the community is likely to be very much dependent on careful post-release planning.

Recommendations

- Because of their permanent neurological deficits and the many secondary problems these deficits generate, FAS/FAE inmates will require extensive planning for their release. Safe and appropriate housing that allows them to establish structure and routine, job training that allows them to work within their abilities, continued social and life skills training that allows them to improve their adaptive functioning, a long term relapse prevention and maintenance program for those with substance abuse needs, and close and supportive monitoring would all help ensure that a stable and successful transition to community life would be made. As with institutional programs, evaluation should be ongoing in order to ensure further refinement as to what works with this difficult population.

Final Comments

FAS/FAE is surely an area where an ounce of prevention is worth a pound of cure. Given the prevalence statistics outlined in this paper, especially with Aboriginal populations, we have a long way to go in our prevention efforts. It is also clear than when prevention fails, early intervention is called for. Again, considering the course and consequences of FAS/FAE, including its impact on the criminal justice system, much more needs to be invested in this area. Finally, like health, educational and social services, correctional services have a responsibility to do what they can to ensure that individuals with FAS/FAE who come in contact with their institutions receive the help they require to maximize their chances of living a stable, crime free community life. No doubt this will require considerable resources in terms of research and programming in order to accomplish this worthwhile goal.

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APPENDIX A

Symptom Checklist (LaDue, Streissguth & Randels, 1992)

Problem	
Attention deficit	School expulsion
Memory problems	Drug abuse
Hyperactivity	Alcohol abuse
Child neglect	Petty larceny
Physical abuse	Grand larceny
Sexual abuse	Vandalism
Sexually inapropriate with people	Drunk driving
Sexually inappropriate with animals	Lying
Legal problems with sexual misconduct	Stealing
Pregnancy/fathered a child	Temper tantrums
Truancy	**Symptom**
School suspension	Disobedience
School dropout	Defiance of authority
	Seizure disorder