

Fetal Alcohol Spectrum Disorder: Strategies for Learning, Behaviour and Communication

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Table of contents

Introduction.....	4
What is FASD and what are its consequences?	4
Definition.....	4
Prevalence	5
Diagnostics.....	5
Table 1: Diagnostic criteria for Fetal Alcohol Spectrum Disorders (adapted from Olson et al., 2007).....	6
Effects on Neurobiology and Neurodevelopment	7
Effects on Cognitive Functioning and Learning.....	8
Effects on Behaviour.....	11
Effects on Communication and Sensory Functioning	13
Effects on Social Development and Functioning	14
Lifespan Developmental Effects	16
Teaching Strategies for Children Diagnosed with FASD.....	16
General Teaching Strategies.....	17
Specific Teaching Strategies.....	19
Strategies identified as helpful by Adolescents and Youth with FASD.....	20
Presentation of new material:.....	21
For working on class assignments:	21
Psychological Assessment Considerations:	22
Psychological Testing.....	22
Interviewing	23
Functional Assessment.....	23
Care Environment	23
Behavioural Interventions	24
Potential for visual learning strategies	25
What are the implications of the limited research?	25
Early Intervention	26
Response to Positive Reinforcement.....	26
Teachers' and Parents' Perspectives:	27
Information for Teachers with concerns that a child may have FASD.....	27

Teachers' Perspectives on Teaching Children with FASD.....	28
Parenting and Foster-Parenting Children with FASD.....	29
Parents' Experiences of Child-Advocacy with Schools.....	30
Issues for Parents and Schools	31
Prevention	32
Useful Internet Resources:	33
New Zealand Resources:.....	33
International Resources:	33
References:.....	35

Introduction

Foetal Alcohol Spectrum Disorder (FASD) currently includes four categories that cover the differing manifestations of deleterious effect of alcohol on the developing fetus. Initially, the focus was on children who evidenced a triad of facial, brain function and developmental characteristics that were identified as typical of significant prenatal alcohol exposure by Jones, Smith, Ulleland, and Streissguth (1973), who labelled these “Fetal Alcohol Syndrome (FAS)”. It was subsequently discovered that approximately 1 per 1000 children display all of the three distinctive features and that three times more children who did not meet the full FAS criteria were being identified with a range of similar cognitive, sensory, developmental and behavioural dysfunctions resulting from *in utero* alcohol exposure. The descriptive term FASD, recognising the spectrum of effect from prenatal alcohol exposure was reached by medical consensus in the USA in 2004 (Olson, Jirikowic, Kartin, & Astley, 2007).

Obviously, possessing a spectrum of cognitive, sensory and behavioural deficits has important implications for a child’s social and educational development. Because of the prevalence of FASD, parents and teachers are increasingly confronted with children who have special developmental and educational needs that require specific understanding and a range of strategies to address them.

The aim of this review is to provide a FASD resource for educational professionals which outlines the nature and consequences of prenatal alcohol exposure and summarises current knowledge regarding developmental trajectories as well as a number of learning and behaviour management strategies for children with FASD relevant to classroom application. Issues for parents and school personnel also are summarised in an effort to enhance awareness and understanding of the particular needs of these children.

What is FASD and what are its consequences?

Definition

FASD is an overarching term for an array of physical, cognitive, behavioural and learning deficits displayed by children exposed *in utero* to alcohol consumed by their pregnant mothers. The effects have lifespan implications for the affected children.

FASD is considered a preventable condition, requiring maternal abstinence from alcohol during pregnancy (Westrup, 2013).

Prevalence

Across a number of studies there are different findings regarding prevalence, however this points to improved diagnostic methods, an increased awareness of FASD characteristics and updating of prevalence data through population surveys. The current US estimate (source: <http://www.fasdcenter.gov/aboutUs/aboutFASD.aspx>) is that 5% of US school children have characteristics of FASD and that this may represent an underestimate due to unreliable reporting of alcohol misuse by mothers at childbirth. Additional confounds include limited medical awareness of FASD, few skilled diagnosticians, and failure to ask mothers of newborns about their prenatal alcohol use (Westrup, 2013). Citing a UK source, Westrup reports 1 per 1000 for FAS and between 1-2% of the population for FASD, with some groups having up to 8.5% FASD in their populations. Italian studies cited by Landgraf, Nothaker, Kopp, & Heinen (2013) reported FASD as between 7.5 and 8.2 per 1000 live births. No New Zealand data were available at the time of writing but, given the widespread use of alcohol in this country and a binge-drinking culture, the findings are likely to at least match the international data and the New Zealand website www.kidshealth.org.nz estimated in 2012 that in this country up to 3000 children per year are likely to be born with FASD. What this points to is an FASD prevalence rate that is at least commensurate with, if not greater than, that for autism (ASD), which US estimates put at 1%. Unlike ASD, FASD is preventable.

Diagnostics

Prior to 1996, Fetal Alcohol Syndrome (FAS) and Fetal Alcohol Effects (FAE) were terms used to describe the consequences of prenatal alcohol exposure on children. In 1996, the Institute of Medicine adopted four diagnostic categories: (Landgraf et al., 2013):

- Fetal Alcohol Syndrome (as defined by Jones, et al., 1973);
- Partial Fetal Alcohol Syndrome (PFAS);
- Alcohol-Related Neurodevelopmental Disorder (ARND)
- Alcohol-Related Birth Defects (ARBD)

Diagnosis is assisted by the use of a 4-digit code, developed at the University of Washington which ranks Growth, Facial Anomalies, CNS damage and Confirmed

Pre-natal Alcohol Exposure by degrees of severity against standardised norms (Astley & Clarren, 2000).

Table 1 below shows the current diagnostic criteria for FASD as per the Institute of Medicine categories and definitions within the 4 Digit Diagnostic Code.

Fetal Alcohol Syndrome (FAS) Diagnostic Features:

- **Growth Deficiency:** Height or weight below 10th percentile;
- **Facial Anomalies:** Small eye-slits, thin upper lip, smooth philtrum (groove between upper lip and nose);
- **CNS damage:** Evidence of structural and/or functional brain abnormality;
- **Confirmed Prenatal Alcohol Exposure:** Reliable evidence of maternal alcohol consumption (*Not necessary if the cluster of facial features is present*).

Partial FAS (PFAS):

- **Growth Deficiency:** Height or weight below 10th percentile;
- **Facial Anomalies:** Some of the FAS characteristics present;
- **CNS Damage:** Evidence of structural and/or functional brain abnormality;
- **Confirmed Prenatal Alcohol Exposure:** Reliable evidence of maternal alcohol misuse.

Alcohol-Related Neurodevelopmental Disorder (ARND):

- **CNS Damage:** Evidence of structural and/or functional brain abnormality;
- **Confirmed Prenatal Alcohol Exposure:** Reliable evidence of maternal alcohol misuse.

Alcohol-Related Birth Defects (ARBD):

- **Physical Defects:** Heart, Kidney, or other anomalies present at birth;
- **Confirmed Prenatal Alcohol Exposure:** Reliable evidence of maternal alcohol misuse.

Table 1: Diagnostic criteria for Fetal Alcohol Spectrum Disorders
(adapted from Olson et al., 2007).

***Note:** ND-PAE is listed in DSM-5 Section III under “Conditions for Further Study”. Entries in this Section of the Manual are intended to encourage further research and

clinical investigation using common terminology and criteria for possible inclusion in future DSM editions rather than to provide for current diagnostic use. FASD is listed as a “Neurobehavioral Disorder due to Prenatal Alcohol Exposure (ND-PAE), pp. 798-801” and covers diagnostic features, associated features supporting the diagnosis, prevalence, development, and course, suicide risk, functional consequences, differential diagnosis and comorbidity.

Since 2008, In New Zealand, multidisciplinary diagnostic teams specialising in FASD, have incorporated medical and neuropsychological evaluation in FASD assessments as a minimum requirement in the delivery of their services according to the Canadian FASD Diagnostic Guidelines (Chudley et al., 2005; Alcohol Healthwatch, 2010). . These Guidelines are currently under revision and will be adopted by New Zealand FASD teams once they come on stream through the published literature.

Effects on Neurobiology and Neurodevelopment

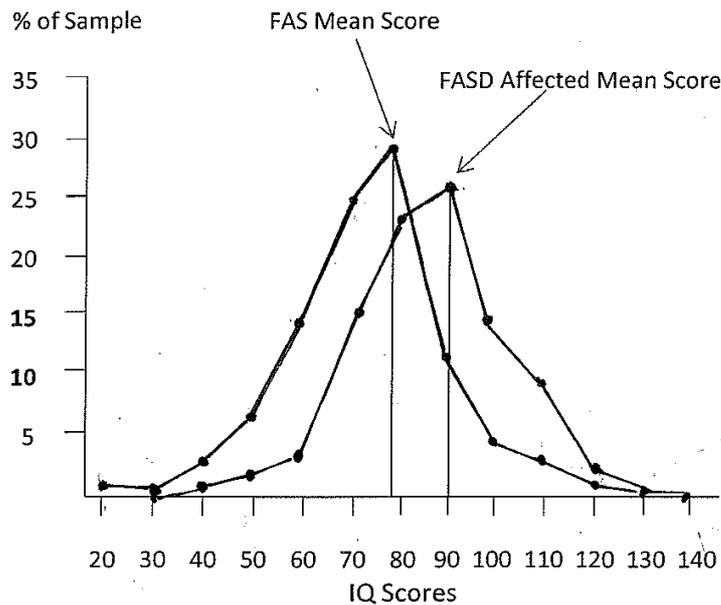
Exposure to alcohol *in utero* can permanently alter neurophysiological development of the child’s central and peripheral nervous systems and the endocrine system, among others. As a result it evidences itself in the child’s psycho-social development, behaviour and temperament. Consequently, depending on the timing, degree and duration of exposure in individual cases, there are broad impacts on language, social cognition and communication and cognitive functioning, including memory, attention and impulse control, and executive functioning (Henry, Sloane, & Black-Pond, 2007). Henry et al. point out that these developmental deficits have obvious lifetime implications for persons affected by FASD. These include difficulties in schooling, employment, parenting, homelessness, substance abuse, mental health, victimization and conflict with the law and, in some cases, shorter life-span. Given that these challenges may intensify in the absence of appropriate recognition and intervention as the person ages, the societal implications are significant. Further, the authors note, women with FASD are at increased risk of substance abuse and with impaired judgement may have limited parenting skills and thus, be at increased risk of producing children affected by FASD.

Summary: The effects of alcohol on the developing brain and nervous system are diverse, pervasive and vary according to the stage of fetal development and the amount and duration of exposure. Cognitive functioning, memory, attention, impulse control, executive brain functioning and social cognition and communication are affected to varying degrees. Neurodevelopmental disorders in FASD are significant regardless of any of the physical characteristics associated with FAS, which simply indicate the timing of exposure early in gestation. FASD can range in severity, but all children on the spectrum have to have significant brain impairments in at least 3 domains to reach the criteria for diagnosis. These effects have life-long implications for the child.

Effects on Cognitive Functioning and Learning

As noted above, because the effects of prenatal alcohol varies across the population of children affected by it due to timing, dose and individual characteristics, the actual consequences for individuals themselves are variable. Nevertheless, all children diagnosed on the fetal alcohol spectrum have significant functional brain impairment upon testing. While many children with a FAS diagnosis may show signs of intellectual disability, a smaller proportion of children not meeting the criteria for FAS has been recorded as intellectually disabled (IQ <70). Conversely, a small proportion has IQ scores within the average to above average range (Green, 2007; Streissguth, Barr, Kogan, & Bookstein, 1996). As shown in Figure 1 below, the Streissguth et al. data range from 20 to 120 (Mean =79) for the 178 FAS diagnosed persons in their sample, and from 40 to 142 (Mean =90) in their 295 persons diagnosed as elsewhere on the FASD spectrum. Note that the distributions are skewed, with the majority of those diagnosed FAS falling at or below IQ 70. Similarly, the majority of those diagnosed as elsewhere on the FASD spectrum fall at or below IQ 90. The age range of their sample was from 3 years to 51 years. These data are similar to those reported in other studies cited in Green's (2007) review. It has been found that children on the FASD spectrum are more likely than typically developing children to score higher on Wechsler Performance indices than on the Verbal scales (Kerns, Don, Mateer, & Streissguth, 1997).

Distribution of IQ Scores for FAS and other FASD affected children



Based on data from Streissguth et al. (1996)

Figure 1: Distribution of Wechsler Full Scale IQ Scores for persons diagnosed FAS and FASD.

Despite the average or above full-scale IQ scores, comparisons between alcohol-exposed children and unexposed peers (Jirikowic, Olson, & Kartin, 2008) show that the former typically perform less well than the latter on a range of neuropsychological tests, such as IQ, the Developmental Neuropsychological Examination (NEPSY), and the Wide Range Achievement Test (WRAT). Within the Fetal Alcohol Spectrum itself, regardless of IQ scores, there is evidence that deficits in adaptive, attention, verbal learning and executive functioning show up on neuropsychological tests through into early adulthood (Edwards & Greenspan, 2010; Kerns et al., 1997), emphasising the lifespan effects of FASD on cognitive functioning and learning. As a consequence, FASD children and youth will experience learning challenges in educational settings right through from pre-school to tertiary education and in employment, that may not be reflected by their IQ scores alone.

Using the Cambridge Neuropsychological Tests Automated Battery (CANTAB), Green, Mihic, Nikkel et al. (2009) found deficits in attention, planning, strategy and working memory that were present in their FASD sample of 89 children aged 8-15 years when compared with an equivalent sample of typically developing peers.

These deficits were present to some degree regardless of where on the FASD spectrum the children fell. They concluded that their data showed that the neurocognitive effects of FASD were both widespread and generalized and that the CABTAB was sensitive enough to measure them.

This very diversity of intellectual and cognitive ability may mean that many children affected by FASD will not be identified as having, or meeting support criteria for, special educational needs. As a result, they may not receive the key academic or learning supports needed to compensate for their learning deficits (Henry, Sloane, & Black-Pond, 2007).

Summary: IQ scores for FAS affected children average 75 and range from 20 to 110 and for children affected prenatally by alcohol but not meeting FAS criteria the mean is 90 with a range from 40 to 140. Performance index scores tend to be higher than those for Verbal indices. Regardless of IQ, children with FASD displayed cognitive and learning deficits. Many children with FASD may not meet special education criteria and thus fail to receive needed support, putting them at a distinct disadvantage.

Specific effects on brain development and learning identified by researchers using other assessment tools can include serious measurable deficits in:

- Executive functioning (planning, organization, & regulation);
- Memory (encoding, rote memory, working memory, spatial memory);
- Reasoning (non-verbal reasoning, abstract thinking, numerical reasoning);
- Sensory Motor Skills (visual/motor integration, grapho-motor skills, visuo-spatial processing, accuracy);
- Language (verbal learning, encoding, comprehension & meaning);
- Attention (short attention span, distractible);
- Adaptive functioning (socialisation, daily living skills)
- Scholastic functioning

Note: These effects vary according to the timing and degree of exposure as well as in the individual developmental consequences of this for each child. However, each child diagnosed on the fetal alcohol spectrum must have evidence of significant impairment (at least 2 standard deviations below the mean) across a minimum of three brain domains.

Effects on Behaviour

The most commonly reported behavioural effect is due to deficits in attention and ease of distraction, which frequently results in a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). Jacobson, Dodge, Burden, Klorman, and Jacobson (2011, cited in Westrup, 2013) found that, in their sample of 262 adolescents exposed *in utero* to alcohol, those more highly exposed were four times more likely to have been diagnosed with ADHD than non-exposed peers. A diagnosis of ADHD typically results in prescription of stimulant medication (e.g., Ritalin). For example, Green et al. (2009) found that of 89 children with FASD in their sample, 43% were prescribed stimulant medication: 33% antipsychotics; and, 11% antidepressant medication. However, it was reported (O'Malley & Nanson, 2002, cited in Westrup, 2013) that children with FASD were less likely than children with ADHD to respond to stimulant medication.

Westrup (2013) also cites a study by Coles (2011) in which the latter identified attentional rather than behavioural factors as primarily associated with FASD, noting that information encoding and attentional "switching" difficulties were causal factors affecting behaviour. The educational challenges for children with FASD are considered to be more a function of the deficits in attention, memory, cognitive functioning, mathematical reasoning, emotional regulation and social competence rather than the causes typically associated with ADHD.

Sood, Delaney-Black, Covington et al. (2001) used the Achenbach Child Behaviour Checklist (CBCL) completed by mothers to assess the effects of prenatal alcohol exposure on 506 African-American children aged 6-7 years with no-, low- and moderate/heavy-prenatal alcohol exposure. They found significant differences between the no-exposure group and the low- and moderate/heavy samples for Externalizing and Aggressive behaviour, concluding that even low levels of alcohol exposure seemed to affect some behaviours. Significant differences between the no-exposure and moderate/high-exposure samples were also found for Delinquent and Total Problems behaviours. Other factors, such as prenatal exposure to drugs, poverty, parental alcohol abuse and mental health, custody transitions and family composition, were included as variables. However, Sood et al. maintained that prenatal alcohol exposure was a significant predictor of "adverse behavioral outcome for Externalizing (Aggressive and Delinquent), Internalizing (Withdrawn), Attention Problems, and Total Problem Score" (p. 6) on the CBCL.

By way of contrast, Victor, Wozniak, and Chang (2008) found that environmental factors were correlated with the degree of physical, behavioural and cognitive dysfunction displayed by children diagnosed with FASD when placement with biological or foster parents were compared. Their finding was that remaining in the biological family led to both lower cognitive function scores and higher behavioural dysfunction than removal and foster-care placement. This was not supported by Howell, Lynch, Platzman, Smith, and Coles (2003), 75% of whose alcohol-affected sample lived with birth-mothers. These adolescents had lower IQs and poorer maths scores than typically developing low-income peers but similar school attendance and disciplinary records. If the Victor et al. findings had generality, it would have meant that the children in the Howell et al. study should have been more likely to have higher levels of behavioural dysfunction than typically developing peers, not less.

In their summary of the literature, Malone and Koren (2012) list many behavioural effects of prenatal exposure to alcohol, including physical aggression, lying, cheating, stealing, animal cruelty, bullying, impulsivity, hyperactivity, lack of remorse, self-injury, substance abuse, and emotional lability. These all contribute to management problems at home and school. Compounding these are the environmental factors that such children also often experience, including poverty, witnessing and /or experiencing domestic violence, low parental education, familial drug and alcohol abuse, coercive, inconsistent and/or abusive parenting, and physical and/or sexual abuse (Malone & Koren). Given this combination of acquired neurobehavioural deficits and environmental risk factors, it is hardly surprising that many of these children face significant difficulties adapting to school and home settings and that their teachers and carers have difficulty understanding and coping with the learning and behaviour challenges they present.

Summary: Children with FASD are frequently misdiagnosed and may be treated for ADHD. ADHD-like behaviours are common in FASD but the research suggests the underlying cause of their hyperactivity may be different and that, as a result, stimulant medications, such as Ritalin, may not be effective in all cases. Externalizing, Aggressive, and Delinquent behaviours can be common, being a major factor in the placement of up to 85% of children on the FAS/FASD spectrum into care in the USA. Children in CYF care here will therefore include a high proportion of children on the FASD spectrum. Behaviours of children diagnosed with FASD living at home or in care also may be affected by environmental factors associated with their personal history, the instability of their living circumstances and/or the quality of care they may have experienced at times.

Effects on Communication and Sensory Functioning

Children identified on the FASD spectrum have been found to present with a range of speech, language and communication problems (Hyter, 2007; Olson et al., 2007), including later than typical speech development, impairments in receptive and expressive language and difficulties with language production. These authors also reported research finding discrepancies between higher competence in vocabulary and basic syntax and the child's ability to functionally apply these skills in social communication. The discrepancies appear to suggest that while FASD-affected children acquire language skills, they lack the ability to use them effectively which subsequently affects their competence as communicators. As they go through schooling their deficits in higher-order communication skills, resulting from cognitive and sensory processing deficits, become evident in areas such as complex syntax, metacognition, and narrative skills.

Children on the FASD spectrum may evidence hearing disorders which compound language and communication problems. In a small sample (n=14) study in an ENT clinic, Church and Gerkin (2001) found that 13 of the children diagnosed with FAS had suffered repeated serious bilateral episodes of otitis media and that four children also had sensori-neural hearing loss, possibly associated with the craniofacial anomalies evident in FAS. As a result all but one of the children were identified as having speech/language disorders, primarily delayed receptive and expressive language that ranged from 1.5 years to 10 years. One child had unintelligible speech. There were no data available for children with other FASD diagnoses. However, given that the involvement of craniofacial anomalies was a major factor in the FAS group, it may be that children diagnosed with FASD who do not meet FAS criteria have communication and language deficits resulting from cognitive dysfunctions. Regardless of whether the result of early structural damage during development, a compromised immune system or the result of communication and language deficits, children on the fetal alcohol spectrum may be prone to hearing problems and should be regularly tested.

Summary: Language develops later and there are identified impairments in expressive and receptive language and language production. Their vocabulary may be larger than their understanding of words and meanings, resulting in difficulty in social communication, understanding and following instructions and developing narrative skills. Other cognitive deficits, including memory, executive functioning and reasoning are likely to compound difficulties in educational settings. Useful information on FASD for SLT's can be found in Hyter (2007). Some children with FAS have been found to have hearing loss due to infections or nerve damage, which will further impact on their learning and behaviour. All children on the fetal alcohol spectrum may be prone to hearing difficulties.

Effects on Social Development and Functioning

The cognitive, communication and behavioural effects of FASD already outlined above combine to affect these children's social and emotional development, so that they often function socially below that expected for their IQ score and chronological age. Comparisons on measures of social cognition and processing of affect with typically developing children and with children diagnosed with ADHD showed that children on the FASD spectrum scored lower than children in either of the comparison samples (Greenbaum, Stevens, Nash, Koren, & Rovet, 2009, cited in Westrup, 2013). Westrup also cites studies which suggest that these deficits in social perception and in the understanding of others' gestures result in misconceptions of hostility and negativity in others, resulting in displays of aggression towards them by children on the FASD spectrum. Social-skills deficits may be compounded by the difficulties some children with FASD have with emotional regulation, conflict resolution and anticipating the consequences of their actions, making formation of friendships and attachments more challenging.

Using standardized observational methods, Olswang, Svensson, and Astley (2010) compared the social behaviours of typically developing primary school-age (7-12 years) children with peers diagnosed with FASD during classroom activities. They found that there were statistically significant and clinically relevant differences in the time the children in each of two groups were prosocial and engaged (on-task), involved in irrelevant activity or being passive and disengaged (off-task). However, they observed that, despite the significant differences between them, both sets of

children actually spent the greatest proportion of their time (over 70%) in class on-task, whether working in small or large groups.

A more recent study of Primary School-aged children (Kjellmer & Olswang, 2013) has compared typically developing peers with a FASD sample more representative of differing degrees of pre-natal alcohol exposure, ranging from Fetal Alcohol Syndrome (FAS) to moderate and mild Alcohol Related Neurodevelopmental Disorder (ARND). Using the same observational methods as Olswang et al. (2010), the study compared social communication in two classroom situations, Cooperation and School Rules. In the Cooperation situation the children worked in pairs or groups to create something or to solve a problem together. For the School Rules component the children were required to follow or comply with the classroom code of conduct in structured teacher-led activities which required independent work. The findings revealed that the social communication of children diagnosed on the FASD spectrum was more changeable in both sets of activity and that the pattern of on-task and off-task behaviours was more variable from day to day than for typically developing peers. What this suggested was that the neuropsychological deficits of the FASD children affecting inhibition, thinking through and planning what to do, organizing and completing the activity, and in monitoring their own progress all result in more changeable behaviour states and make sustained on-task performance difficult. Day-to-day changes in activity, group composition and the degree of structure in the various classroom activities are often challenging for these children, increasing the variability in their on-task behaviour.

Kjellmer and Olswang (2013) consider the cumulative effects of the variability in on-task performance over time to be likely to influence teacher and peer perceptions of the social competence of children with FASD as problematic, unpredictable and challenging in the classroom environment, all of which impact on forming and maintaining social relationships.

Summary: The neurodevelopmental effects of prenatal alcohol exposure affect social development due to poor emotional regulation, difficulty in reading the emotions and gestures of others, and low stress tolerance that can lead to hostile/aggressive behaviours. Social development lags behind expectations based on age and IQ. In the classroom effective participation in-group and individual activities is also affected by variable cognitive and behavior states and reduced ability to cope with day-to-day changes in the demands and degree of structure of activities. Teachers and peers may find these characteristics problematic.

Lifespan Developmental Effects

Prenatal exposure to alcohol affects neurological development which, as noted above, subsequently has pervasive negative effects on many aspects cognitive functioning, learning, behaviour and social competence. As a result persons on the FASD spectrum face a lifetime of challenges that affect their ability to function in the same way as typically developing persons do. Blackburn, Carpenter, and Egerton (2010) summarised the findings from a number of studies and reported the following difficulties:

- Mental health problems in 87% of a small sample of 5 to 13-year-olds;
- Disrupted school experience in 60% of a sample aged over 11 years;
- Trouble with the law for 60% of a sample of 415 adolescents;
- Imprisonment. Many in prison are suspected of being on the FASD spectrum;
- Inappropriate sexual behaviour and dependent living problems;
- Increased risk of becoming substance abusers;
- Increased suicide risk (23% of adults attempt, 43% have considered it);
- Significantly greater chance of welfare foster-placement than non-FASD children

These risk factors also point to the likelihood of unemployment, mental health problems, and parenting and relationship difficulties in adulthood (Temple, Shewfelt, Tao et al., 2011).

Teaching Strategies for Children Diagnosed with FASD

Children with FASD present teachers with a range of significant challenges as a result of their cognitive, communication and behavioural deficits. In addition, each of these children may have a unique profile of deficits and strengths as the effects of prenatal exposure to alcohol on individuals vary so much. Because the IQ range in children diagnosed with FASD is so broad, the manner in which deficits are expressed also varies considerably. For example, children with FASD who have high IQs and a high degree of verbal competence may confound teacher expectations and their, behavioural challenges, poor social competence, low developmental level and emotional immaturity may seem less evident. As a result, it is important to identify and build on strengths and to adopt strategies for instruction and classroom behaviour management that assist these children to minimise their deficits.

Numerous articles written by educational professionals are available which provide advice for teachers on teaching children on the FASD spectrum (Blackburn, Carpenter, & Egerton, 2010; Carpenter, 2011; Duquette, Stodel, Fullarton, & Hagglund, 2006; Dybdahl & Ryan, 2009; Kalberg & Buckley, 2007; Miller, 2006; Ryan, 2006). In addition, there is an extensive and excellent website for teachers with information on all aspects of teaching children with FASD (referred to in the website as FAS and Fetal Alcohol Effects [FAE] which includes all non-FAS categories on the FASD spectrum) which the Government of British Columbia (Canada) has provided for its teachers (See Part 5: Useful Internet Resources).

General Teaching Strategies

Ryan (2006) has set out a series of eight instructional tips for teachers supporting children with FASD in their classrooms. These are adapted here to also include advice from Green (2007) and Carpenter (2011) and are summarized below:

1. Build a positive relationship with the child. Carefully assess the child's academic and social skills, know their strengths and interests, Also, treat him/her as a person first.
2. Build a working relationship with the child's family. They can encourage good study habits at home, monitor the student's work to help the family plan for success and to support student engagement. Include whanau and cultural participation. School staff also need to negotiate homework requirements with family which account for the child's learning challenges and school-day stress.
3. Develop partnerships. Build collaboration between family, school and social/community agencies, and any wraparound services provided. This is important for all families raising children with FASD, whether children with FASD are in whānau care or fostered, as they may have associated mental health, social and personal problems which may require counselling, after-school activities, family support and/or respite care.
4. Develop social skills. Children with FASD have difficulties forming and maintaining social relationships, keeping boundaries, maintaining self-control and in feeling good about themselves. Use a range of social skills strategies (e.g., social stories, peer buddies, scripts and role-plays for teaching sharing, cooperation, and compliment-giving) to build and support appropriate social and interpersonal behaviours.

5. Provide a structured environment. Predictable routines that are posted and/or via visual schedules, and 3-5 simple, clear rules which are posted, taught, prompted, regularly revisited and consistently applied, with rewards for compliance are important for children with FASD. Setting and maintaining clear boundaries, rewarding attention, engagement and independent task attempts as well as task completion. It may be necessary to restructure tasks in a way that can be more easily understood if the child is making excuses or showing task avoidant behaviour so that they are able to complete it.
6. Use repetition and consistency. Children with FASD are distractible, inattentive and have memory challenges. Give simple instructions one step at a time, be prepared to explain, repeat and to answer questions. Use visuals to present tasks and task sequences, e.g., numbers or arrows to show what is next, or colour codes to identify different activities. Use over-learning strategies and routines to support retention. Use concrete examples, and concrete experiences to support learning. Check often to monitor progress and see if help is needed. Support them with patience when they ask for assistance.
7. Modify the classroom environment and the curriculum. Greet the child at the start of each day and add a positive comment on appearance or any report of an extra-mural activity. Place the child near the front of the class and, if in a group, with supportive peers who will help maintain on-task behaviour and provide good behaviour role modelling.

Use a coloured mat or tape on the floor to define the child's "space" for mat times and to identify different work areas. Shorten tasks, e.g., limit the number of worksheet items to be completed. Give the child a request card for breaks or toilet visits and a quiet activity space with preferred activities to go to if overwhelmed or distressed. Manage fidgeting with brief exercise breaks or a 'stress' ball to squeeze. Minimize distractions, speak in a calm voice, supervise closely and offer support and encouragement frequently. Allow for tasks to be completed later if the child cannot complete within the given time, praise attempts.

Use visuals, prompts and/or timers to prepare for transitions to different activities, locations or breaks. Use visible exchangeable "rewards" such as marbles, counters or "classroom dollars" along with praise to support a range of academic and social behaviours. "Catch them being good!" Advise parents on how to prepare the child for the school day, such as having clothes set out for the morning, helping with equipment needed for the day, etc. Use the

child's interests and strengths as part of your teaching strategy across the curriculum. Consider their developmental level when planning and teaching.

8. Obtain advice or additional support. Consider discussion with family/whanau on referral to relevant specialist services, such as Ministry of Education Intensive Behaviour Support, Child and Family Mental Health Services or to a Resource Teacher Learning and Behaviour. Direct families to seek specific information from agencies which specialise in FASD (see resource list for details).

These strategies represent some important best practice points derived from experience in teaching children with FASD and include elements of teaching practice that work well for a range of children with special educational needs. Each strategy is important and more likely to be effective when used in combination with others.

Summary: Building positive relationships with the child, family/whanau/caregivers and community agencies is important. Use of a range of classroom strategies that provide structure, consistency, clear rules, expectations and boundaries will provide certainty and limit challenges. Teaching strategies that simplify tasks, reduce stress and use strengths and interests to support and encourage achievement within a supportive environment increase engagement and a sense of success. Preparing for transitions and change reduces anxiety and distress. Building social competency through peer support, role modelling and social skills strategies helps development of social awareness, cooperation and sharing. Seek outside professional help if needed.

Specific Teaching Strategies

The British Columbia website (Listed in Part 5 below) is an excellent source of specific information on teaching children with FASD across a wide range of curriculum components. Additional information relevant to teaching, learning and classroom behaviour management can be found in the Manitoba and Alberta websites also listed in Part 5. All of these materials are in pdf form and can be downloaded free, providing an excellent resource for teachers.

While there is not space here to identify all of the specific strategies for teaching children with FASD, it is important to note that these children face particular challenges when it comes to numeracy and mathematics. The causes of this are believed to be primarily related to deficits in phonological working memory (Rasmussen & Bisanz, 2010), with additional elements of memory failure and cognitive dysfunction when dealing with mathematical problems that include a verbal

component (e.g., can't recall all of the instructions and/or integrate the components of the problem) and with executive cognitive functioning deficits when dealing with applied problems (e.g., difficulty in generalizing reasoning from math facts to an application). Rasmussen & Bisanz indicate that teaching strategies that focus on helping these children develop skills for remembering information, such as rehearsal, repetition, and overlearning have shown demonstrable benefits. In addition, they suggest that adding visual and tactile stimuli (e.g., Cuesenaire Rods) as aids to problem solving. This may make problems more concrete and easier for these children to solve. Also, breaking problems down into smaller, simpler steps could reduce the executive function demands and increase the likelihood of effective problem solution. Ryan (2006) notes that teachers found that reducing demands by setting fewer problems, allowing completion at a later time and "debriefing" on task completion reduced frustration and "giving up" on maths tasks.

Summary: Children with FASD experience a range of learning challenges across the whole curriculum. Numeracy presents particular challenges and requires specific strategies to address these, including helping the child develop memory strategies, using multisensory inputs, such as visual and tactile elements, and concrete problems. Simplifying and breaking tasks into smaller components can also assist in problem solution. Setting fewer problems, allowing more time and "debriefing" were helpful in supporting task completion.

Strategies identified as helpful by Adolescents and Youth with FASD

Duquette et al. (2006) summarised their findings from interviews with a small sample of adolescents and young adults diagnosed with FASD which had been elicited as part of a wider study. Students outlined the characteristics of teachers they identified as 'Worst' and 'Best'.

In describing the characteristics of their worst teachers, the participants cited being embarrassed by teachers raising their voice or ignoring their requests when they [the students] wanted clarification of something they had not understood in relation to lesson content, instructions or assignments. Use of humiliation and put-downs by teachers, and being singled out were reported as distressing. 'Worst' teachers were also identified as "poorly organized, sarcastic, and generally unavailable to meet the students' needs"(p. 30).

“Best” teachers were identified as informed about FASD and understanding that their academic and behavioural challenges were a result of “can’t do it” rather than “won’t do it”. The students reported that these teachers also “were patient, willing to take time to explain things clearly, answer questions and provide accommodations [in terms of curriculum adaptation, activity demands and behaviour challenges]” (p. 30). Duquette et al. obtained a list of recommendations for teachers (p.30) regarding:

Presentation of new material:

- Break concepts into smaller chunks.
- Talk slowly.
- Give clear explanations, use concrete examples.
- Remember “It’s not that I won’t do it, it is just that I can’t do it”
- Repeat concepts and procedures.
- Use hands-on activities and concrete materials.
- Demonstrate what has to be done instead of just oral instructions/descriptions.
- Make the lesson enjoyable, for instance, by injecting some humour.

For working on class assignments:

- Be willing to answer questions and re-explain concepts or how to do the assignment.
- Provide in-class assistance, either one-on-one or in small groups.
- Be approachable, do not make the student feel uncomfortable about asking questions.
- Know the student’s strengths and weaknesses.
- Be aware of times when a student is anxious or frustrated and redirect activities.
- Supervise and support the student closely.
- Maintain a structured environment, routines, schedules, classroom rules and consequences that are repeated often and linked with choices
- Use a multisensory approach (visual, auditory, tactile) with hands-on activities and concrete materials to teach concepts.
- Teach shorter lessons with active student involvement and guided practice.
- Break tasks down into smaller components and provide breaks between components.

- Give one instruction at a time and demonstrate what is to be done; be very specific and use simple language.
- Make a list of the sequence of procedures and activities and display it.
- Teach the student to make lists and use a planner.
- Predetermine the composition of groups and avoid students being left out.
- Help students to learn and progress with gentle prompts and reminders rather than expecting them to be able to consistently self-manage and work independently.
- Use praise and positive reinforcement as often as possible to build positive behaviour.
- For tests, homework or projects, modify the size or work demands of assignments to allow FASD students to work independently on them and complete them, or allow more time for completion to compensate for slower work rates and/or lower ability.

Summary: From the students' perspective, working with supportive, encouraging and caring teachers who were willing to adapt their teaching style, learning materials and strategies to meet their learning needs was seen as a primary factor in keeping them motivated, learning and in school.

Psychological Assessment Considerations:

Psychological Testing

Diagnosis of FASD involves both medical and neuropsychological assessment using a comprehensive range of standardised neuropsychological tests to identify areas of deficit and strengths across multiple brain domains. Standard psychological tests such as the Wechsler instruments (e.g., WISC; WPPSI), the Wide Range Achievement Test (WRAT) and neurodevelopmental instruments such as the Developmental Neuropsychological Examination (NEPSY) and the Cambridge Neuropsychological Tests Automated Battery (CANTAB) have been used (Green, Mihic, Nikkel et al. (2009); Jirikowic et al., 2008; Kerns et al., 1997). Behavioural assessment has included the Achenbach Child Behaviour Checklist (CBCL) (Sood et al., 2001). Because of the considerable variability in IQ scores in children with FASD, a large proportion may not qualify as Intellectually Disabled on that ground, which

has meant in some countries that they do not receive much needed social and educational services and support.

Interviewing

Children on the FASD spectrum may prove suggestible and are likely to confabulate due to comprehension and memory deficits. Use of open-ended questions that let the child explain in their own words what occurred, is important to minimize suggestion and 'compliance with authority'. Keep communication and instructions simple and unambiguous.

Functional Assessment

Children with FASD have as much individuality as any other child. Therefore not all of the variables that may "cause" challenging behaviour are necessarily linked to brain function in these children (Kalberg & Buckley, 2007; Malone & Koren; 2012). While some of their challenging behaviour may result from FASD symptoms, it is important to evaluate possible environmental factors that exacerbate or maintain it, such as distractions, a curriculum that is too difficult and complex, lack of foundation skills in earlier years, teasing or bullying, and lack of effective teaching strategies and inadequate positive reinforcement for attempts at tasks and for appropriate behaviour. Equally, children with FASD may be talented, skilled and have many favourable attributes that can be highlighted and positively influenced.

Care Environment

Internationally, a significant proportion of children diagnosed with FASD (up to 85%) are eventually placed outside their family. Also, Victor et al. (2008) found 56% of their sample had multiple foster-care placements and Sood et al. (2001) reported 35% of their higher exposure sample as having experienced custody changes. The proportion of New Zealand children on the FASD spectrum in Child, Youth and Family care may well be similar to the international findings. As a consequence, the issue of the nature of, and stability in, care environment and parenting skills and support needs to be a consideration in assessment of these children.

Summary: Neuropsychological assessment covering multiple brain domains is an important component of evaluating children with FASD, In addition, good classroom observations and evaluation of school data on achievement and behaviour are essential. A functional assessment of the child in the classroom environment is essential to identify potential ecological factors influencing behaviour, concentration and motivation. Because such children also present challenges to parents, it is important to assess the family context and the extent to which the family need or have support and professional input to enhance skills, reduce stress and provide respite when needed.

Behavioural Interventions

The research literature examined currently offers no well-designed or large-scale studies which demonstrate effective behavioural interventions for children on the FASD spectrum. Miller and Herpel (2006) offer advice on designing interventions which can be applied in the classroom context based primarily on a review of the general FASD literature. In essence, their advice is similar to much of that provided in this review, much of which is based on “collective wisdom” rather than evidence informed research. However, their article does have some useful tables with specific ideas that summarize a range of strategies and situations which could prove useful to school personnel working with a child diagnosed with FASD.

Gunn (2013) produced a sound review of FASD intervention research between 1998 and 2012 relevant to cognitive functioning, learning, parenting and social skills development. She set clear criteria for including studies, namely that the studies included children with FASD and aged between 5 and 13 years of age, or their caregivers; that there was an intervention; that the research setting was school, home or community; and, that the dependent variable was in some way beneficial to the special educational needs of children with FASD and did not involve psychopharmacological medication. Gunn also evaluated the quality of the methodology and design of the studies for inclusion. Only eleven of 47 studies, filtered down from a total of 681 located in the literature search, met these inclusion criteria.

While many of the 11 studies reviewed showed promise, in that there was some evidence of improvements in specific skills and/or ratings of behaviour, five focused

on parents and children, with only one (Kable, Coles, & Taddeo, 2007; cited in Gunn, 2013) having direct relevance to classroom learning in that it included a six-week mathematics tutoring intervention related to homework. The remaining six studies could be said to have a degree of direct relevance for application in educational settings in that they targeted such topics as learning, cognition, and language and literacy. Of these, two had very small samples (n=10) and lacked control groups. Of the other four, Gunn identified various methodological and design flaws in each, such as confounding variables, lack of adequate control groups, reliance on parental ratings, failure to follow-up and/or little or no generalization from the training environment to classroom. She was led, correctly, to conclude that more research was needed if the special educational needs of children with FASD were to be supported.

Potential for visual learning strategies

One study by Coles, Strickland, Padgett, and Bellmoff (2007) teaching fire safety pointed to the possibility of using video-games and, potentially, video self-modelling (Dowrick, 2012) to teach generalizable academic (Prater, Carter, Hitchcock, & Dowrick, 2012) and classroom behaviour skills (Biliias-Lolis, Chafouleas, Kheke, & Bray, 2012; Madaus & Ruberto, 2012) to children with FASD. Given that their preference for, and response to, visual learning is similar to that of the children on the ASD spectrum who have benefitted from this approach, consideration should be given to evaluating its efficacy with FASD children.

What are the implications of the limited research?

Given that each child on the FASD spectrum is likely to have her or his own unique constellation of effects from prenatal exposure to alcohol, it may be that large sample research studies that put children diagnosed with FASD together and average the findings do not effectively serve the needs of individual children. Research into the intervention strategies for children on the fetal alcohol spectrum has a very short history and as yet too few to fully evaluate effectiveness. While no studies of strategies applied to classroom behavioural management or teaching in school were located in this review, this should not lead to dismissing the value of the strategies identified earlier (in Part 2 a., b., & c. above) through teaching experience and those reported to be useful by children with FASD. Therein lies collective experience that is worth distilling, trialling and testing to determine what works best for a given child.

Early Intervention

Because FASD is a neurodevelopmental disorder, early intervention (i.e., before age 3 years) offers the possibility of ameliorating some of the cognitive and behavioural deficits which evidence themselves later in development. A study by Yazdani, Motz, and Koren (2009) compared a sample of 28 alcohol-affected children with 15 non-alcohol-exposed children whose mothers had misused other drugs in pregnancy. All children were aged less than three years and their mothers had low-income and low education backgrounds. The mother child-dyads participated in a “Breaking the Cycle” programme which offered significant maternal and child health, welfare and educational support. Data from the Bailey Scale of Infant Development (BSID) and the Wechsler Preschool & Primary Scale of Intelligence (WPPSI) administered between 2-3 years of age showed no significant differences between the two groups of children and scores for all were within the average range. Exposure to the programme was also beneficial for the mothers whose parenting skills, personal health and welfare also improved.

Early and intensive intervention and support programmes offer the prospect of longer-term benefits to the child, parent and to society if the effects of prenatal exposure can be moderated. Clearly, more studies are needed to further demonstrate the findings of the Yazdani et al. study, but the findings show promise and deserve replication.

Response to Positive Reinforcement

Some authors have suggested that children on the FASD spectrum do not respond to positive reinforcement. In an effort to test this claim out, Eagle and Kerns (2011) compared children with FASD and typically developing children on a task which provided positive reinforcement (points or tokens) and response cost for a proportion (70%) of errors. They found that, while children on the FASD spectrum were slower to learn the task, both groups of participants showed similar patterns of acquisition. The FASD group stood out in that they were more dependent on recent information, rather than accumulated knowledge as the trials proceeded, which is consistent with the notion that their memory deficits affect learning. Typical children responded slightly better to points and the FASD sample to tokens, but the difference in effectiveness between the abstract (points) reinforcers and the concrete (tokens) was not significant. Questions remain as to the effects of the FASD characteristics of inattention, impulsivity, and poor memory in specific learning environments and on generalizing newly acquired skills to other settings or related activities.

Summary: No studies demonstrating the efficacy of specific classroom interventions were found in the literature search. Advice to teachers on a range of teaching and management strategies to apply in the classroom is available but their individual and collective effectiveness remains empirically untested. Intervention studies relevant to special educational needs are few and most lack the necessary quality and relevance for classroom application. Video self-modelling may, potentially, be useful. Early intervention with pre-school children and mothers shows promise. Evidence from a study on positive reinforcement shows FASD children respond to it, but learn more slowly than peers.

Teachers' and Parents' Perspectives:

Information for Teachers with concerns that a child may have FASD

Research indicates that diagnosis of FASD requires assessment by specially trained medical professionals and neuropsychologists. Because FASD carries with it the implication that a mother has exposed the developing foetus she was carrying to alcohol, this is a very sensitive issue. Many children with FASD may not be identified at birth as most do not display the facial features evident in FAS and medical staff and midwives do not routinely ask new mothers whether they consumed alcohol during their pregnancy.

Accordingly, if you have a child in your classroom who is:

- Very active and inattentive;
- Struggles to remember and follow 2-3 component instructions;
- Finds remembering facts, especially mathematical facts, from one day to the next difficult;
- Struggles to think things through without considerable help;
- Acts out and has aggressive outbursts (including tantrums and/or swearing), especially when challenged by academic tasks or during transitions; and;
- Struggles to make and keep friends and often appears to make things up.

Then you may have a child who would benefit from being assessed by a specialist to see if FASD is a possible explanation. Any referral would have to be approached carefully if the child is living with her or his parent as implying alcohol misuse in pregnancy is serious. Given that it is estimated that up to 4 in 100 school-aged children has FASD, there are likely to be such children in your school. They require the special teaching strategies described earlier.

Teachers' Perspectives on Teaching Children with FASD

Research involving teachers points to many concerns about their lack of knowledge about FASD; the need for more effective education and support focused on teaching and management strategies for supporting these children in the classroom; and the need to be told of the child's diagnosis and special needs when they come into the school system (Dybdahl & Ryan, 2009). The experience of day-to-day unpredictability of behaviour, mood and engagement was considered a problem in working with some children, as were problems with memory, such as forgetting what had been taught the day before. Teachers found that using visual and tactile learning supports, real-life experiences and concrete examples enabled them to tap into strengths. In addition, using high-interest activities, materials and gentle prompts helped to maintain focus and engagement. A number of teachers used sporting skills and achievements as a way to build self-esteem. Primary level teachers worried about how well students would transition into high-school because of the increased transitions across classrooms and teachers, and the lower level of understanding and communication of needs that could result. Koren (2011) exposes and corrects myths about FASD that some teachers hold (e.g., their mothers are alcoholics, child cannot progress beyond Year 5, people with FASD have low IQs).

Summary: Teachers felt a need for better education and professional development around understanding and teaching children with FAS/FASD. While there were challenges in terms of learning and behaviour, teachers also identified strengths, such as visual cues and memory, response to tactile and concrete examples and to high-interest activities. In addition, sporting skills and achievements were used to build self-esteem and confidence.

Appreciation of a child's strengths provides a platform for enhancing both academic and social skills and for building functional behaviours that build confidence and competence

Parenting and Foster-Parenting Children with FASD

Because a large proportion of FAS/FASD children end up in care, foster-parenting is a particular issue. The situation is compounded by the fact that many of these children have experienced removal from birth-family and then go on to experience multiple foster-care placements and associated psychological consequences (Victor et al., 2008; Westrup, 2013).

Whitehurst (2011) surveyed three foster parents and one natural parent with a total of seven FASD children between them. The children's ages ranged from 4 years of age to 24 years. She identified six themes: Initial awareness of something being wrong and associated difficulties in getting a diagnosis or useful information; Experiencing the disorder as a challenge and trying to find ways to overcome the eating, sleeping, motoric and behaviour problems by trial and error; Experiencing difference by knowing your child behaved and functioned differently from typically developing peers; Experiencing emotional conflict, stress and distress from the challenges of everyday parenting, from the fears for the child's future, from the lack of adequate social support from agencies, friends and family, and, in the case of a natural parent, guilt over having brought this on her child; Experiencing disability by having to explain to others what FASD was, battling with medical and social services for support which each considered the other should provide, and having to fight for school enrolment and to educate teachers about FASD in an effort to have the child's educational needs met; Experiencing support occurred when professionals were well informed about FASD. A similar Canadian study by Sanders and Buck (2010) supports these findings.

Brown, Bednar, and Sigvaldason (2007) studied the causes of placement breakdown for alcohol-affected children in foster care. This is important because international research suggests that up to 85% of children with FAS/FASD are in care (Carpenter, 2011) and often experience multiple placements (Victor et al., 2008, Westrup, 2013). Brown et al. asked 63 foster-carers of children with FASD what would lead them to end the placement of such a child. Six clusters of reasons emerged. These were:

1. Conduct problems, involving severe behaviour such as self-harming and absconding, poor hygiene, sleeping and eating problems and unhealthy attachment;

2. Failure of the child to adapt to the family, including failure to keep routines or meet parental expectations and the child not wishing to be in their care; Harm to Family, where concerns for their own or others' safety or social isolation due to the child's presence in the family were factors;
3. The stress placed on the family or their children, stealing, harming animals and inappropriate sexual behaviour were also issues. Children with FASD have problems with impulse control, aggression, lying, sexuality and hyperactivity and demand high levels of attention, all of which prove stressful and demanding;
4. Insufficient information about the children placed with them, about FASD, and inadequate support all were problematic. In addition, negative community perceptions of foster-parents were unhelpful;
5. Being taken for granted resulted in foster parents feeling unappreciated by the system and professionals. The need for more specialist support, financial resources and respite could be factors in terminating a placement. In addition, their extended family and community agencies could be critical or unhelpful, leading to placement breakdown.

Parents' Experiences of Child-Advocacy with Schools

It is not uncommon for parents and foster-parents of adolescent children with special educational needs to find that some educational professionals are difficult to work with and present barriers to admitting, supporting, and maintaining a child's involvement in formal education. Duquette, Stodel, Fullarton, and Haglund (2011) contacted 36 adoptive parents of children with FASD and interviewed them about their experiences with educators. Although experiences differed, four common advocacy themes were identified, awareness, information seeking, presenting the case, and, monitoring.

Initial awareness of a child-problem for these parents often came from the emergence of problems at school in respect of behaviour, academic failure, and teacher complaints that the child needed specialist assessment or a different placement. This typically resulted in the parent seeking additional information through a medical or psychological assessment and/or via the internet to learn about FASD. Some children were misdiagnosed with ADHD or as Learning Disabled and some parents found that medical professionals were ill-informed about FASD and/or reluctant to diagnose it. Parents also sought information on educational options for their child, some resorted to home-schooling, others to private schools and some chose to push for public schooling to meet their child's needs. All had to learn how

school systems functioned and how to navigate their way through them to fight for and obtain programme options and support for their children.

Getting the schools to accommodate to the needs of the child was a common challenge. The parents found themselves educating teachers and school authorities about FASD and many had difficulty in getting the teachers and principals to maintain consistency in support from year to year. Some felt that principals and teachers resented being told what was necessary for the children by parents, leaving the latter feeling ignored or side-lined. Also, IEPs were often formulated with parental input but not followed through with by the school.

The parents had to closely monitor the implementation of IEPs and often found that teachers quickly gave up on the agreed accommodations and adaptations in curriculum and that their child became discouraged by failure, requiring further parental intervention in an effort to support their child. Parents found this process demanding and stressful on both themselves and their marriage. Some felt guilty about not having done enough to advocate for their child. In all cases, the children stayed in school and eventually graduated from high school, pointing to the importance of parental involvement and advocacy in education.

Summary: Professionals and educators working with children with FASD and their family/whanau/caregivers need to have a sound knowledge of FASD and how to effectively inform and support parents and caregivers in order to minimize the emotional and personal parenting costs. Understanding the demands and stressors on parents and ensuring supports are in place may reduce the risk of placement breakdown and support the child's effective educational placement and progress in learning. Educating principals and teachers in effective classroom strategies and having functional IEPs that are actually followed through on is important for maintaining the child in school and in maintaining parental support and faith in the school.

Issues for Parents and Schools

While educational authorities and school management and staff will benefit from training and dissemination of information about FASD, there are other issues which necessitate that schools receive accurate information about pupils with FASD in order to meet the needs of those children. Because there are no formal procedures for schools to obtain students' medical information, they rely on parents and legal

guardians to provide this information. A confounding factor is that provision of specialist FASD diagnostic services is still in its infancy in Aotearoa/New Zealand. Although these are in the process of development, it is likely that many children are not assessed or identified because of gaps in the current service or because it is not possible to ascertain their prenatal risk of alcohol exposure with any certainty. Also, a proportion of the population is relatively transient, often because of seasonal employment in rural industries such as orchard and vineyard work, shearing and share-milking. This often involves children moving school, sometimes more than once in a year, with the result that diagnostic information may not follow a child's documentation in the process of transition.

Parents and teachers also need to recognise that behaviours and behavioural expectations are likely to vary between home and school which may lead to confusion and conflicting views and a need for clarification and understanding between the parties (Timler & Olswang, 2001).

Summary: Schools are reliant on parents and legal guardians to provide FASD diagnostic information at enrolment or, if the child is already enrolled, when it becomes available. This will enable the school and its teachers to be prepared to learn about FASD and allow them to meet the child's special educational needs using appropriate teaching, learning and behaviour management strategies.

Prevention

Because FASD is a preventable disorder, health education programmes for Intermediate and Secondary School students and young adults in Tertiary Education must necessarily include the risks of alcohol and drug use during pregnancy. The alcohol-related risks include having a child who has to face a lifetime of cognitive, learning, behaviour and social challenges. These result in a potential for educational, social, marital and employment failure, substance abuse and involvement in crime. No parent would intentionally plan a future of this nature for their unborn child and they can avoid it by the simple step of not consuming alcohol during pregnancy. However, the majority of children are socialised at an early age by the pro-drinking messages surrounding them, adult role modelling, and the general acceptance and availability of alcohol in their environment. Such an environment combined with a high degree of unplanned pregnancy among young New Zealand women, limits the

degree to which FASD could be eliminated, irrespective of awareness of the consequences. Advice and support on teaching about FASD is available from Alcohol Healthwatch, the Government's Health Promotion Agency and the Ministry of Health among others (see website below).

Useful Internet Resources:

New Zealand Resources:

<http://www.ahw.org.nz>

The Alcohol Healthwatch website provides information and resources on a range of issues related to alcohol use and abuse in New Zealand, including public health evidence, community action, legislation and a range of activities undertaken by the organization. Alcohol Healthwatch It also coordinates the Fetal Alcohol Network NZ (see below) and their website has links to FASD related resources.

<http://www.fan.org.nz>

The Fetal Alcohol Network is an organization comprised of parents of persons with FASD and a range of professionals involved in working with and researching FASD. It is supported by Alcohol Healthwatch and has links to a number of international organizations involved with FASD. It provides advocacy, information and access to resources and research relating to the spectrum.

<http://www.fasd-can.org.nz>

A New Zealand website of a not-for-profit support organisation Trust set up to unite and strengthen families living with FASD through raising funds for FASD education, membership, information and resources for parents and professionals on FASD.

<http://www.kidshealth.org.nz>

A New Zealand child health information website. The FASD information is produced by the Paediatric Society of New Zealand and the Starship Foundation.

International Resources:

<http://www.bced.gov.bc.ca/specialed/fas>

Produced by the British Columbia education authorities, this website is great resource for teachers, with information and advice on FAS and FASD (referred to as

Fetal Alcohol Effects or FAE in this document) and a coverage of a range of curriculum areas to support teaching in these. Free download of resource booklet.

<http://www.depts.washington.edu/fadu>

The University of Washington Fetal Alcohol

Drug Unit website for information, research, and advice regarding FASD. Articles can be downloaded.

<http://www.education.ALBERTA.ca/teachers/resources/fasd.aspx>

The website contains well-presented free downloadable resources for teachers, including professional development materials which could be used to inform staff about FASD.

http://www.edu.gov.mb.ca/K12/specedu/fas/pdf/FASD_Document.pdf

This Manitoba government website offers information about FASD for school administrators and classroom teachers. This includes strategies for behaviour management and classroom teaching and assessment aimed at building on the children's strengths. It includes Positive Behaviour Support, which fits well with the NZ MoE initiative PB4L strategy. Download this information free.

<http://www.eufasd.org>

This is the website of the European FASD Alliance. It provides access to summaries of news articles, videos and materials as well as abstracts of recent articles in its regularly updated archive.

<http://www.fasdcenter.gov/aboutUs/aboutFASD.aspx>

This is the US Government expert centre for information on FASD. It is regularly updated and carries summaries of FASD research findings.

<http://www.jptcp.com>

This is the website of the Canadian Journal of Population Therapeutics and Clinical Pharmacology. It offers access to the Journal resources which include many articles on FAS/FASD

<http://motherisk.org/FAR>

A Canadian research site offering downloads of research papers on FASD.

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