

An Innovative Look at Early Intervention for Children Affected by Prenatal Alcohol Exposure

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From Parents of Children with FASD:

"That's the whole idea... early intervention so we can catch the problems in those [first] difficult years..."

"So, when our kids are little and we have an [intervention] program, then we would have structure and know the way to handle things right from the start."

Abstract: Early intervention is vital for children born affected by prenatal alcohol exposure, and may take advantage of 'plasticity' in the developing brain. Early diagnosis is associated with more positive life outcomes among those with FASD. Early intervention leads to better child and family outcomes in populations with similar challenges and, in initial research, to improved outcomes among those with prenatal alcohol exposure. This chapter begins with a 'neurodevelopmental viewpoint,' central to thinking about early intervention with this population. This viewpoint emphasizes 'brain-based difficulties' arising from alcohol's teratogenic effects, and the need to reduce risks and increase protective factors. Current research on child and family strengths and deficits, and the necessary step of early identification, are reviewed. Treatment recommendations from expert professional opinion and the collective family wisdom, and findings from the few studies of early intervention in this population, are provided. To spark research progress in the field, a variety of promising existing early interventions are discussed, including ideas for needed adaptations. Links are provided to websites, parent support information, training topics for early intervention providers, and new data on behavior regulation in young children with FASD. Early intervention is an exciting research direction for the field of FASD.

INTRODUCTION

A Real-Life Scene Between a Young Boy with FASD and His Mother:

His mom asks: *"What should people know about working with kids like you?"*

The boy groans and says: *"We have to have another talk about how my brain works?"*

His mom explains there is a book being written about kids like him and that people interested in FASD will read this book. He jumps up on the bed with his arms outstretched and head thrown back, and yells: *"This is FANTASTIC mom!"*

The boy says: *"They should know how to help our brains work really hard. It would be like I told them a secret of how to help and they got it!... We need to be working together to make things better for me and other people..."*

They talk more, and then the boy says: *"I feel like I am in the center of the world and I am part of the world. I am happy to be me!"*

—Jan, age 8

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Sending this to the Authors, the Mom Writes About Her Son:

“[This conversation] reaffirmed to me how truly insightful he is about himself and his place in this world.”

–Ian’s mom

Children born prenatally alcohol-exposed come into the world with personal strengths, but also with biological vulnerabilities. Children who are affected by their prenatal alcohol exposure can show significant neurodevelopmental disabilities, even in the early years. These disabilities often go unidentified or misunderstood, but actually can be clinically diagnosed within a set of conditions collectively called Fetal Alcohol Spectrum Disorders (FASD). Early diagnosis, before age 6 years, has been identified as one of the most important ‘protective’ factors associated with greater odds of positive long-term outcomes for individuals with FASD [1]. Intervention provided in the early years has been shown to improve child and family outcome in the very few studies of children born prenatally alcohol-exposed carried out so far.

Early intervention has also been effective for other groups of children who experience similar life challenges, or have deficits like those who are affected by prenatal alcohol exposure. These include children who show developmental disabilities, polydrug exposure, traumatic brain injury, disruptive behavior disorders, and also children at high psychosocial risk or who have been maltreated. Early intervention is important, because it has the potential to take advantage of the newly understood plasticity of the developing brain to improve at least some of the neurological impairment resulting from alcohol’s teratogenic effects.

There is a general lack of intervention research focused on children affected by prenatal alcohol exposure or known to have FASD, even though interest in this topic is rapidly growing [2-4]. This is especially true for intervention with very young children. Accordingly, this chapter reviews the small amount of available treatment outcome data for young children born prenatally alcohol-exposed, but focuses more on exploring some of the existing early intervention ideas and approaches that hold promise for this surprisingly large population of young children (birth to 8 years) and their families. The chapter emphasis is on treatments that improve children’s early development or aim to improve care giving and family outcome. There is a special focus on treatments that improve children’s behavioral regulation, given the importance of this early developmental achievement for overall life success.

Readers of this chapter will find information about how to look at the problem of FASD using a ‘neurodevelopmental viewpoint’ to better understand this disability. They will learn about the ins and outs of early identification, and explore treatment recommendations coming from experts (found in a clinical database) and from the wisdom of families (found in a review of personal exchanges over the internet). Readers of this chapter will also learn about a variety of promising approaches to early intervention for this population, and think about how they can use these ideas in their own area of practice to help children with FASD and the families that care for them.

A NEURODEVELOPMENTAL VIEWPOINT

In designing interventions for young children affected by prenatal alcohol exposure, or with FASD, an important first step is to change perspective. This means taking a ‘neurodevelopmental viewpoint.’ This viewpoint is based on research that explains the teratogenic effects of alcohol, the collective experience of families and researchers, and several important developmental theories. This viewpoint is also based on principles from ‘developmental psychopathology’— a scientific field that explores the developmental influences on the life pathways children follow that lead to typical or atypical developmental outcomes. Taking this neurodevelopmental viewpoint can make it easier to see when certain types of intervention are not appropriate, or how to adapt treatment approaches (and change expectations) to increase effectiveness. This viewpoint is the foundation for a positive parenting intervention specialized for families raising children with neurodevelopmental disabilities (especially FASD) called the ‘Families Moving Forward Program’ [5(study #5)], discussed later in this chapter. The neurodevelopmental viewpoint and intervention basics have previously been discussed in depth as they apply to early intervention by Olson and her colleagues [6]. Many pioneering researchers and clinicians have led the way to developing this viewpoint and intervention ideas for this population [7-12].

Researcher Kodituwakku has recently presented his own neurodevelopmental framework, based on cognitive neuroscience principles, to guide development of skills-teaching interventions for children with FASD [13]. While there are differences from the viewpoint presented in this chapter, Kodituwakku's framework leads to some of the same conclusions about intervention in the field of FASD. Among these are the importance of paying attention to a child's cognitive-behavioral profile when designing interventions, and the central need to provide training on self-regulation as early as possible.

“Brain-Based” Difficulties

Alcohol is a neurobehavioral teratogen. A great deal of research shows that prenatal alcohol exposure is a risk factor that changes how the fetal brain and central nervous system develop, and that these changes result in functional difficulties that start early and persist lifelong. A central idea in thinking about individuals affected by prenatal alcohol exposure, including those with FASD, is that they have ‘brain-based’ difficulties in cognition, learning and memory, or what might be called a generalized deficit in processing complex information [14,15]. These difficulties may be misinterpreted (at least in part) as disruptive or dysfunctional behavior. In young children, brain-based difficulties can often be seen as problems or delays in behavior regulation. This can include negative affect and difficulties in arousal regulation, stress reactivity, impulse control, sensory integration, early attention skills, sleep and more. They may also show difficulties in fine and gross motor function, and in coordination and balance. These underlying neurodevelopmental problems may be called ‘primary disabilities’ [7]. Observed in the day-to-day life of young children, these disabilities also show up as markedly lowered adaptive function (children's ability to communicate, get along with other people socially, and do daily living skills). Further, these may show up as lifestyle problems for young children, including social skill deficits, difficulties in pre-academic and early academic achievement and, quite distressing to care givers, challenging and often disruptive behavior.

Intervention Basics

When working with those affected by prenatal alcohol exposure, or with FASD, it is vital for care givers and clinicians to go through a process of ‘reframing’ their understanding of the child's behavioral difficulties as, at least in part, ‘brain-based.’ This has been highlighted as a central intervention principle by Olson and her colleagues [5], and pioneering clinician Malbin [9]. The earlier the process of reframing can take place, the more likely it is thought that a good outcome will occur. Reframing helps parents gain a more positive view of their child, and of the parent-child relationship, which can help jumpstart the use of the most appropriate care giving methods, and move everyone down a more positive life path. The field of developmental disabilities refers to this process of reframing as gaining a more positive ‘cognitive appraisal,’ while the important framework of attachment theory calls this gaining a more positive ‘relational schema.’ Once the basic process of reframing has begun, it becomes clear to a care giver that many of a young child's learning and behavior problems are ‘brain-based.’ It is then easier for a care giver to have a more positive and realistic view of the affected individual, feel more effective, and be motivated and ‘ready to change’ their own ways of doing things. This can be true for parents, grandparents, school staff, and even daycare providers and coaches.

In addition to reframing, clinicians and researchers have come up with basic intervention processes that seem to be the ‘heart’ of what works with individuals affected by prenatal alcohol exposure, or with FASD, and their families. These intervention processes are part of the practical positive parenting intervention designed for families raising children with FASD, discussed later, called the “Families Moving Forward” program.

As a first line of treatment, it is logical for care givers to use methods that take into account these brain-based difficulties, and help improve how well the affected individual fits into his or her environment. Olson and her team use the term ‘accommodations’ for these care giving methods [5]. Accommodations include a wide variety of environmental modifications, many learned from research on ‘cognitive rehabilitation’ for individuals with traumatic brain injury. Some accommodations apply to most affected individuals, including young children, such as increasing structure and predictability in school or home routines, and making sure there is a high level of supervision [16]. These accommodations are geared to the child's ‘developmental age’ rather than chronological age. There are some accommodations that must be tailored to the needs of the particular individual with FASD. One example for young children might be a teacher who provides memory aids to a child who has problems remembering everyday information. Another example, used for a child who has trouble processing what they hear,

might be parents trying to pause while speaking and using simple, concrete language. There are many, many creative ideas for accommodations, such as ‘fidgets’ to keep a child with high activity and restlessness appropriately focused, ear phones to help a child who cannot handle a noisy environment, or putting a ‘picture schedule’ on the wall to help a child stay organized during the daily routine. Accommodations largely focus on changing the environment or how the care giver behaves around the child.

There are other intervention processes that can help young children with ‘primary disabilities’ resulting from the effects of prenatal alcohol exposure. Parenting practices can be tailored to the needs of children in this population. Very early in life, ‘relationship-focused’ approaches to care giver training may be useful and have good scientific evidence to show improvements in child and family outcome. These include selected professional home visiting and/or infant mental health approaches. As children reach preschool age and beyond, ‘positive parenting’ interventions that use adapted behavioral principles and are useful for children with developmental disabilities (and/or high psychosocial risk), and their families, may be helpful.

One such behavioral approach is often called ‘positive behavior support’ (PBS) [17-19]. PBS (sometimes called functional behavioral assessment) has research data showing that it helps improve outcomes in individuals with developmental disabilities (and challenging behavior), and also improves the lives of their families. Learning a PBS approach helps parents (and teachers) understand how to ‘shape’ their own behavior and create careful behavior plans in order to help a child replace problem behavior with more desirable behavior. Care givers do this to help an affected individual meet needs and behave in ways that are adaptive and functional day-to-day (rather than showing challenging, often negative behavior). Helping care givers learn to use a ‘user-friendly’ PBS approach that has been adapted for children with FASD, and to do this on their own, is a promising parenting practice. Olson and her colleagues have called use of PBS by care givers a ‘brainstorming’ process [5].

There are many family needs when raising children affected by prenatal alcohol exposure, or with FASD [20]. Raising children with FASD is highly stressful for care givers [20,21]. Parents need support, both for emotional reasons and for help in figuring out the best parenting strategies, and when trying to reframe their understanding of a child’s behavior. The need for parent support, either through parent groups or one-on-one relationships with other parents who have gone through the same situation, is another intervention basic. Research from the field of developmental disabilities suggests that parents and families with the right kind of support do better later on [22]. Parents also need education about FASD, advocacy, the importance of care giver self-care, and the need for respite services throughout the lifespan. Teachers (and coaches, therapists and, later on, employers) also need this kind of education.

Another intervention basic is the fact that a full continuum of care is needed for families raising individuals with FASD. Early intervention is important, because it may take advantage of plasticity of the young brain and help create a more positive life direction. But as affected individuals grow older, they need ongoing and ever-changing services. Early intervention is a time when families need to be prepared for the future, which often includes time for grieving and accepting what is to come. ‘Anticipatory guidance,’ or talking with families about what may come up and what will likely be needed to help, and how to advocate for services that can be hard to get, is an important part of early intervention. Early intervention providers must recognize that neurodevelopmental disabilities are lifelong. This means that services are needed at every phase in development, as clinical researchers Paley and O’Connor make quite clear in their recent intervention review [10].

There are evidence-based or scientifically-validated interventions, developed for other clinical populations, that are promising for use with young children affected by prenatal alcohol exposure, or with FASD. However, these interventions likely need to be adapted for use with this clinical population to improve effectiveness. FASD describes a clinical population that has complex cognitive and learning disabilities (which may sometimes be hard to measure or understand), who also often have experienced many psychosocial risks. Because of this, child behavior change and care giver understanding of brain-based difficulties will be slow to take place. Parents may feel unsuccessful and will be stressed and personally distressed. For these and other reasons, some necessary treatment adaptations for any early intervention approach used with this population are summarized in Table 1.

Table 1: Suggested Adaptations for Evidenced Based Early Intervention Approaches Targeted to Children with FASD and/or Their Care givers

| Adaptation | Examples |
|---|---|
| Offer services over a longer period of time | <ul style="list-style-type: none"> • Increase the prescribed number of treatment sessions, and repeat treatment modules, as needed • Divide up longer sessions or sessions with more content, as needed |
| Expect slower progress in intervention | <ul style="list-style-type: none"> • Repeat treatment modules, as needed • Review and practice concepts more often than prescribed • For care givers, help them understand children’s brain-based difficulties and resulting slower progress • For children, repeat instructions as needed |
| Use examples, modalities and treatment goals that are appropriate for the population | <ul style="list-style-type: none"> • For care givers, if using videotaped materials for learning through observational methods, be sure examples show children with FASD • For children, add visual props to assist in learning and reduce verbal input • For children, aim first for improved adaptive behavior |
| Consider children’s sensory sensitivities and behavior regulation problems in intervention | <ul style="list-style-type: none"> • For care givers, teach approaches that accommodate child problems, such as difficulty filtering out auditory input or issues with impulse control • For children, deliver services in small groups, quieter conditions, shorter sessions, etc. to reduce stimulation and allow children to stay calm |
| Build on care giver and child strengths and provide emotional support to care givers | <ul style="list-style-type: none"> • For many care givers, existing good basic parenting skills can be assets • For children, high social motivation and willingness to ask and receive help from care givers can be assets • For care givers, who may have many strengths, ongoing emotional support (or referral for therapy) will still be needed to tolerate slow progress, deal with high stress and personal distress, and improve feelings of effectiveness |

Risk and Protective Factors

As all children develop, their life path and outcomes are negatively affected by the risks they face, and positively affected by life influences that protect them. Risks can include genetic factors (such as family history of major mental illness), medical factors (such as serious illness or head injury), as well as family and socioeconomic factors (such as abuse/neglect, poverty, unsafe neighborhoods, or poor access to social services). Protective factors can also be biological or environmental, and can help reduce risk and promote children’s development. Examples of protective factors include a child’s good innate intelligence, good nutrition, parental warmth and involvement, a supportive family or community, and many other influences that help a child’s life move in a positive direction. Scientific research on development shows that a changing mix of risk and protective factors alters a child’s developmental outcome over time. If the mix is tipped toward risk factors, the child’s life path can lead to unwanted and undesirable outcomes. If the mix is tipped toward protective factors, the child’s life path can be altered in a positive direction. Early intervention is often aimed toward tipping the mix in this positive direction. Risk and protective factors exist at the level of the individual, the levels of relationships and families, and at multiple levels in the wider world of systems and services surrounding the family. In developmental theory, this is called an ‘ecological model’ of developmental influences [23]. It is thought best to design treatments to decrease risks and promote protective factors (at all these levels) that are good for children in general, and those that are specific to the population.

Prenatal alcohol exposure is one crucial risk factor common to this population. Of course, children born alcohol-exposed often have other prenatal exposures that are also risk factors, such as to cigarettes or street drugs. In a

clinical database, Olson and colleagues [6] found that 84.5% of 781 young children, birth to age 8 years, were prenatally exposed to cigarettes and/or licit or illicit drugs along with alcohol. These other prenatal exposures can lead to negative developmental outcomes. But a combination of prenatal exposures may have even greater negative consequences for development.

For children in general, as well as for those affected by prenatal alcohol exposure, individual child characteristics can act as postnatal risk or protective factors. Among young children, for example, developmental research generally shows that a ‘difficult’ temperament, high levels of negative affect, behavioral cues that are hard for care givers to read, disrupted sleep patterns, and problems in behavior regulation can all be notable risk factors that lead a child down a more difficult life path. Studies conducted to date suggest that all these difficulties commonly occur among young children born prenatally alcohol-exposed [7, 24-27]. Developmental research shows that areas of intact development (such as good basic language skills and individually variable areas of cognitive strength), an engaging manner, and high social motivation can all play a role in helping children travel a more positive life path. Clinical observations by Olson and others suggest these strengths commonly occur among young children with prenatal alcohol exposure [20]. Those who study developmental psychopathology point out that some children seem to be ‘resilient,’ which means they generally appear less affected by serious, negative influences on development than might typically be expected. The study of resilient individuals is an important area of research for the field of FASD that has not yet been accomplished— for very young children, or at any stage of life.

Developmental theories highlight many crucial environmental influences for young children at the level of their ‘primary relationships.’ These are their relationships with parents and those who care directly for them. Important influences in primary relationships are the quality of care giving (at home and in childcare), and the warmth and security of attachment and bonding between the child and primary care giver(s). For a young child, the ‘goodness-of-fit’ between the child and parent is vital. Also important are a child’s success in learning affect and behavior regulation through ‘attunement’ with their parent as an infant, and learning social rules from their parents when they reach the toddlerhood and preschool years [28,29]. Serious problems, such as child maltreatment, can also be a pivotal influence in a child’s primary relationships. Environmental influences for young children may also occur at the broader level of the family. These influences, such as strong social support for the family or the availability of services (such as respite care), are also very important for young children. Research on protective factors specific for FASD are discussed in the next section.

Discussing FASD, Streissguth [7] suggests that if those in the young child’s world, at all these levels, respond inappropriately to the child’s ‘primary disabilities’ (deficits caused by prenatal alcohol exposure combined with other risk factors), or do not provide adequate support, then the young child’s path through life will not go well. Poor adaptive function will continue and problem behaviors will increase. Taken further, if there is an ongoing cycle of inappropriate responses, there may be what is called a negative developmental progression. Developmental psychologists see this as a line-up of ‘chain reactions’ that can lead to negative outcomes [30]. Over time, unless there is healthy natural change or some kind of effective intervention, secondary disabilities, such as disrupted school experiences or substance use, are likely to emerge from this negative developmental progression. Secondary disabilities bring lifelong negative consequences to the affected individual and their family.

Promising Directions for Early Intervention

Keeping a neurodevelopmental viewpoint in mind, the second half of this chapter has been organized into broad sections of important material about early intervention. These sections first cover descriptive research on the population. The following sections cover early intervention approaches the authors have selected as especially promising for use with young children affected by prenatal alcohol exposure, or with FASD, and (when applicable) their families. There are certainly other approaches, some that are considered evidence-based, which may also be useful in intervention with this population. Information about some of these approaches has been provided in the Appendices linked to this chapter. When there is research specifically with the population of children affected by prenatal alcohol exposure, this is highlighted. An important point to keep in mind is that multi-component interventions may be most effective with this clinical population. For instance, parenting interventions should likely be combined with linkage to parent support groups and to therapies that teach children specific important skills that are a problem because of prenatal alcohol exposure (such as better self-regulation).

RESEARCH ON CHARACTERISTICS OF YOUNG CHILDREN AFFECTED BY PRENATAL ALCOHOL EXPOSURE, THEIR FAMILIES AND PROTECTIVE FACTORS

What does research so far say about the characteristics of young children affected by prenatal alcohol exposure, and their families? What is known about protective factors? This body of research points the way to creating, choosing and adapting approaches to early intervention that will be most effective. There seem to be particular strengths that can be built upon in early intervention, and protective factors that can be put in place. There also are areas of difficulty for infants and young children and their families, and in the systems that serve them. These should be treatment targets for early intervention.

Strengths of Children and Families

The clinical literature and informal reports are filled with descriptions of how engaging, innocent, straightforward, amusing, curious, social and alert young children with an FASD can be, and the sometimes intriguing perspective they bring to understanding life. Many stories of families raising children with FASD are tales of courage, persistence, flexibility and the ability to stay optimistic in the face of challenge. Yet there are limited research data describing child and care giver strengths, especially for adoptive families [20]. Highlights of what is known about child and care giver strengths from data and clinical observations are briefly summarized in Table 2.

Table 2: Positive Characteristics of Children with FASD and their Care givers

| Child Strengths | Care giver Strengths |
|---|--|
| <ul style="list-style-type: none"> • Many positively engaged with their families • Many willing to seek/receive help from care givers • Often high social motivation and engaging manner, and interest in being connected emotionally to others • Often have good basic language skills (depending on overall IQ) • Individual children have their own unique profile of strengths | <ul style="list-style-type: none"> • <i>Birth parents:</i> Work to understand and cope with their child's neurodevelopmental problems • <i>Foster parents:</i> Often have positive motives for fostering and positive characteristics that enhance their parenting • <i>All parents (assuming in recovery/in stable households):</i> Often have good basic parenting practices • <i>All parents:</i> Experience both the 'special benefits' and 'common benefits' of parenting, and have their own unique profile of strengths |

Data show that about half of a group of young children with FASD were reported by their parents to show positive characteristics, summarized as being engaged with their families and willing to receive (and even seek) help from their care givers [20]. Clinical observations reveal that young children with FASD often show aspects of good social relatedness and high motivation to be connected socially and emotionally, even with people they do not know well. This seems often to be the case despite higher environmental risks experienced by these children. These data all suggest that early intervention approaches where parents and teachers assist children in practicing new skills with their peers, should work well with this population because they build on children's high social motivation and willingness to receive help [20]. But sometimes children born prenatally exposed do show a diagnosed attachment disorder, or other significant psychological impact of maltreatment. When this occurs, early intervention must be adjusted to address this problem during treatment, and good social motivation cannot be counted upon. Promising intervention ideas for young children drawn from the field of child maltreatment are discussed later in this chapter.

Positive motives for successful fostering of children with FASD have been studied. Findings of positive motives included wanting to help children with disabilities and to help children stay connected with their families and communities [31]. Qualitative study of birth mothers raising children with FASD found these women worked independently to develop understanding and coping methods for their children's neurodevelopmental problems [32]. Very appropriate parenting attitudes have been reported by parents of all types raising preschool and school-aged children with FASD and very challenging behavior, even before treatment was applied [20]. As illustrated in the real-life 'scene' between Ian and his mother presented at the outset of this chapter, families raising children with FASD anecdotally report experiencing 'special benefits' as their parents, which are positives and benefits above and

beyond the usual ‘common benefits’ of parenting. Care giver-focused interventions that emphasize the rewards of these ‘special benefits’ of parenting may keep adults involved, increase parenting satisfaction, and also promote care giver positive cognitive appraisal (or ‘relational schema’) and optimism [5,20]. Both relationship-building and ‘positive parenting’ interventions do this, to some extent, and are discussed later in the chapter.

Protective Factors for this Population

There is limited research identifying protective influences for the population of individuals with FASD or prenatal alcohol exposure. Available data are briefly summarized in Table 3 as applied to early intervention.

Table 3: Summary of Protective Factors for Individuals with FASD Based on Research

| At the Level of Care giving |
|---|
| <p><i>For foster parents:</i></p> <ul style="list-style-type: none"> • Care giver ability to provide structure and a high level of organization • The right kind of personality and skills for raising children with FASD • A good diagnostic understanding of FASD |
| <p><i>For all family types (birth, adoptive, foster):</i></p> <ul style="list-style-type: none"> • Having an early diagnosis of a condition on the fetal alcohol spectrum (before age 6 years) • Descriptors of stable, nurturant, appropriately stimulating ‘good quality’ care giving (in early and middle childhood) • Child not living with parents involved with substance abuse or directly experiencing violence • Positive perceptions of the child and parent-child relationship by care givers, such as what may occur from ‘reframing,’ and other improvements in care giver attitudes • Improved care giver knowledge and parenting practices, such as: relationship-focused interventions; knowledge of FASD and advocacy; use of ‘accommodations’ and ‘brainstorming;’ or other positive parenting practices |
| At the Level of Systems and Supports |
| <p><i>For all family types (birth, adoptive, foster):</i></p> <ul style="list-style-type: none"> • Good parent support and self-help (see Appendix 1 for information on parent support) • Availability, positive nature and good quality of family and neighbor social support • Availability of social services funding • Availability of effective treatments for families raising young children with FASD, and adjunct treatments such as recovery support for parents |

At the Level of Care Giving

Qualitative study of families raising children with FASD found what was needed for successful placements with foster parents were care giver protective factors. These included parental ability to provide structure and a high level of organization, and a good understanding of FASD. Also important was the right kind of personality and skills, such as having flexibility, dedication, love and endurance, though it was also considered important to match individual parent strengths with a particular child’s needs [33].

For all family structures, descriptors of stable, nurturant, appropriately stimulating ‘good quality’ care giving (in early and middle childhood), and not living with parents involved with substance abuse or experiencing violence, were found to have a universally ‘protective’ influence on outcome. This meant lowered odds of secondary

disabilities among affected individuals in natural history research on FASD [34]. Also, a more positive home environment (in terms of developmental stimulation) in elementary school was related to less severe alcohol effects on aspects of cognition at age 7½ years in longitudinal study of prenatal alcohol exposure [35]. Improved knowledge and altered care giver attitudes and behavior (relative to comparison groups) were found in several interventions applied to children with FASD and their families, coupled with findings of positive child outcome [5]. In the field of developmental disabilities, positive perceptions on the part of care givers have been found to serve as an adaptive coping mechanism [36]. These findings provide some guidance for early intervention. Needed are addiction treatment and recovery support (when necessary), knowledge about FASD, help with creating environmental structure and other ‘accommodations,’ encouragement of positive attitudes among care givers, and parenting programs specialized for this population.

At the Level of Systems and Supports

Protective influences at the wider level of the supports and services surrounding the family have been pinpointed by research in the field of FASD. Parent support and self-help were found to have positive effects on outcome for families raising children with FASD regardless of family type (birth, adoptive, foster) [20]. Availability of family and neighbor social support, and of social services funding, were recognized as important for successful foster placements [33]. Streissguth *et al.* [34] identified the availability of appropriate social services as an important factor associated with reduced odds of secondary disabilities in a diverse group of individuals with FASD across a wide age range. Studying disabilities in general, Bailey [22] stated that the nature and quality of social support available to families raising children with disabilities have repeatedly been demonstrated as vital to positive family adaptation. This means that parent support and linkage to appropriate social services are vital to early intervention. Parent support is discussed in supplementary material connected to this chapter (Appendix 1.)

Child Deficits

In a large clinical sample of children 8 years and younger born alcohol-exposed, Olson *et al.* [6] found that only just over half showed marked developmental delay in the first three years of life. This means that while some show global deficits, more than one-fourth of the sample had early developmental profiles well within normal limits using standard developmental tests. The same percentages applied to the smaller group of children later diagnosed with FAS or partial FAS. This suggests that deficits may not be obvious in standardized test results or many areas of function until middle childhood and beyond. But research so far does show that many infants and young children affected by prenatal alcohol exposure may show problems not often measured in developmental tests. These hard-to-measure problems are found in deficits in adaptive function, physiological processes and regulatory capacity, motor skills, and in certain precursor impairments of later-developing cognitive skills. It appears that special methods of early identification are necessary for this population, since the usual ways of finding children with problems may not work well. These are discussed in the next section of this chapter. Categories of difficulties for this population are briefly presented in Table 4.

Adaptive Behavior Deficits

Among children with FASD aged 5 to 8 years, significantly greater problems in adaptive function were found compared to a group of typically developing peers [37]. Research has clearly identified adaptive behavior deficits among young children with prenatal alcohol exposure. These deficits were not attributable only to children’s level of IQ, and did not seem related to postnatal disruption as measured by multiple home placements [38]. Children with FASD have been found to show delayed daily living skills even compared to those with ADHD, with socialization and communication increasing areas of difficulty as children with FASD grow older. Importantly, compared to healthy controls, young children with FASD much more frequently needed intensive levels of adaptive support from parents and teachers (presumably creating greater care giver burden) [37]. The extent of a child’s need for adaptive support is a better predictor of service intensity than a child’s level of adaptive behavior or maladaptive behavior alone. This suggests that early interventions for young children with FASD should be designed to improve child adaptive behavior (ability to function day-to-day), and help the family provide more intensive adaptive support. Most early intervention approaches discussed in this chapter have these dual aims.

Table 4: Difficulties for Young Children with FASD, Their Care givers and Families Based on Research

| For Young Children |
|---|
| <ul style="list-style-type: none"> • Adaptive behavior deficits, with increased need for a higher level of care giver support to function well day-to-day • Global or more subtle, wide-ranging developmental deficits (though subtle deficits may not become apparent until the child is older) • Precursors of later deficits in higher-order cognitive skills, negative affectivity and problems in behavior regulation • Disturbance of physiological processes and regulatory capacity, including deficits in early motor skills • Social skills deficits and behavioral variability • Potential for child psychopathology and child behavior problems |
| For Care givers/Families |
| <p><i>For all family types (birth, adoptive, foster):</i></p> <ul style="list-style-type: none"> • High care giving stress related to the child • High levels of unmet, important family needs • Specific need for respite care and understanding of FASD by all service systems • Often high psychosocial risk status for the family |

Global or Wide-Ranging Developmental Deficits

Some individuals with FASD can show global developmental or intellectual delays. Broadly speaking, however, as many affected individuals grow older, deficits related to the teratogenic effects of alcohol can eventually emerge in many domains. These can include deficits in arousal and attention, behavior (or self) regulation, processing speed, cognition, learning and memory, executive functions, and higher-level integrative language abilities (especially social communication and pragmatics). Deficits can also occur in the ability to encode visual stimuli, visual-spatial abilities, neurological ‘soft signs’ indicating sensory-motor immaturities, and fine and gross motor skills (including difficulties in such areas as precision, dynamic balance, inefficient motor performance and handwriting). Further, deficits can occur in academic achievement, social skills, and behavior problems. No ‘behavioral phenotype’ (core set of characteristics) has been identified for FASD at this point in time, though it has been suggested that this population generally has difficulties with complex information-processing [14,15]. Because of the variable way in which alcohol exposure causes CNS damage and dysfunction, no two individuals with FASD are alike in specific clinical features, even if they share common areas of deficit.

The chapter in this book by Coles and her colleagues does a good job reviewing research on deficits found among children with FASD as these relate to educational interventions. However, research has documented these deficits primarily as of middle childhood and beyond. It is surprising how few studies look at the skills of very young children affected by prenatal alcohol exposure.

Precursors of Later Deficits in Higher-Order Cognitive Skills, Negative Affectivity, and Behavior Regulation

Developmental skills are highly interrelated in young children, so it is hard to identify subtle deficits or sort out deficits in specific domains. Developmental difficulties in these early years can show up as global delays, but may often be more subtle and found as impairments in the precursors of higher-level cognitive skills. Thought of most generally, problems among young children affected by prenatal alcohol exposure may have problems in emotional and behavioral regulation. This includes a general tendency toward ‘negative affectivity’ (internal feelings of distress and engagement with others that are not pleasurable; related to negative moods such as anger, fear, or worry) [39].

Problems in behavior regulation may be a central area of difficulty in young children affected by prenatal alcohol exposure. New research by the authors finds behavior regulation difficulties among young children (aged 4 to 8

years) diagnosed with FASD, compared to a matched group of peers from high-risk environments. Findings are presented in a short, interesting paper linked to this chapter (see Appendix 2). Developmental researchers who study behavior and self-regulation suggest that children with high physiological arousal and poor regulatory capacity fare worse in social situations [40,41]. Such children may have problems ‘returning to baseline,’ and ‘settling down’ to make good social decisions [42,43]. Unfortunately, this does not bode well for young children affected by prenatal alcohol exposure who show just these kinds of problems. For this group, interventions to help children improve behavior regulation are vital, and discussed later in this chapter.

Developmental systems research has traced the early life path of young children born prenatally alcohol-exposed, studying them within their primary care giving relationships. Programmatic studies indicate these children more often show individual characteristics that place them at risk for negative outcomes, including behavior problems. Biologically-based difficulties in their development negatively impact the quality of the early parent-child relationship, although parent characteristics certainly also affect this relationship. High psychosocial risk (such as poverty) worsens these negative effects on the parent-child relationship, and leads to even more difficulties in child outcome later on [24, 44-47]. Relationship-focused and positive parenting interventions that can help the early parent-child relationship go more smoothly are important for children born prenatally alcohol-exposed, and are discussed later in this chapter.

Disturbance of Physiological Processes and Regulatory Capacity, Including Deficits in Motor Skills

In young children affected by prenatal alcohol exposure or with FASD, ‘brain-based’ difficulties may first be seen in disturbances of physiological processes and regulatory capacity in daytime function, and even in disrupted sleep. Infants with prenatal alcohol exposure may have early motor problems, such as tone abnormalities, tremulousness, oral-motor difficulties, and delayed acquisition of motor milestones [48,49]. Infants born prenatally exposed to alcohol appear to have greater attention and arousal regulation problems, and greater stress reactivity. They may possibly encode environmental events differently at a neurophysiological level [27].

In a cutting-edge longitudinal study, Kable and Coles [27] examined early attentional regulation among 6-month-old infants. Using heart rate measures, infants more heavily exposed to alcohol responded more slowly to stimuli and were rated as significantly higher in arousal level when exposed to a series of auditory tones and picture stimuli. In a more recent study, Haley *et al.* [25] found that heavier exposure to alcohol before birth was associated with greater activation of infant stress response systems. Greater maternal drinking was related to faster heart rates, increased negative affect and other indicators of stress reactivity in infants of 5 to 7 months of age, when the babies were exposed to a mild social stressor. This was true even when controlling for other important confounding factors. There were differences in reactivity among girls and boys.

The study by Haley and his colleagues reflects a larger body of animal and human research on an interesting link between prenatal alcohol exposure and activation of a key component of the stress system (the limbic-hypothalamic-pituitary-adrenal [L-HPA] Axis). Abnormalities of what is generally called the HPA Axis can have negative effects for cognitive, affective and behavioral development. Interventions that improve function of the HPA Axis are of real interest for children born prenatally alcohol-exposed, with several such interventions discussed later in this chapter.

Social Skills Deficits and Behavioral Variability

Starting at about age 6 years, several studies reveal that social skills deficits are common among children diagnosed with FASD. Clinical observations have noted such problems as being overly friendly with strangers, socially immature, or being innocent, naïve and suggestible. Schonfeld *et al.* [50] found social skill deficits based on both parent and teacher report, with ratings of children’s executive functioning predicting their level of social skills. Deficits can include problems in important areas of peer relations in children as young as 6 years, such as friendship skills [51]. A recent study has detected difficulties in social information processing in children as young as 7 years, suggesting there are problems with social cognitive processes underlying successful peer social interaction in children with heavy prenatal alcohol exposure [52]. Detailed classroom observation data show that young school-aged children also show higher rates of behavioral variability, compared to age- and gender-matched classroom peers [53]. Early intervention may be able to target some of the early impairment that lays the foundation for these later social skills deficits and behavioral variability.

Potential for Child Psychopathology and Challenging Behavior

Researchers O'Connor and Paley [39] emphasize that children born prenatally alcohol-exposed show "negative affectivity". However, they also note that eventual developmental outcomes depend on the responses and personal characteristics of the children's care givers. They conclude that prenatal alcohol exposure can act as a significant risk factor for early onset child psychopathology, along with other risks. O'Connor and Paley [39] have speculated that a developmental progression to conduct problems may occur in this population, given underlying problems in social information processing coupled with difficulties in self-regulation, and the presence of adverse environmental influences. O'Connor and Paley [47] also found an increased risk of childhood-onset depression in young children prenatally exposed to alcohol, with environmental influences playing an important role.

For young children in this population, behavior problems often discussed in the informal family literature include poor understanding of consequences, temper tantrums and angry outbursts, unpredictable behavior and changeable mood, noncompliance, impulsivity and difficulty inhibiting responses. A higher prevalence of behavioral difficulties and psychiatric conditions in this population not only occurs in childhood, but also in adolescence and adulthood. These difficulties can also be affected by both positive and negative environmental influences [39].

Care Giver/Family Difficulties

Recent studies consistently show very high child-related stress among care givers raising children with FASD (e.g., [20,21]). The source of this stress appears to lie more in children's problems with executive function than in their level of IQ or their diagnosis on the fetal alcohol spectrum [21]. Clinical wisdom suggests that stress and burden may occur in part because care givers may misunderstand the reasons for a child's dysfunctional behavior, and/or because home and school environments are not set up to accommodate the child's areas of deficit. Families raising children affected by prenatal alcohol exposure describe themes of family impact and family needs (e.g., care giver emotional and financial burden, impact on sibling function, lack of professional services) [20,32,33,54]. Town hall meetings emphasize the need for respite care and understanding of FASD by all service systems [55].

The Influence of Psychosocial Risk

Epidemiologic research reveals that environmental risk often characterizes the experience of families and young children born prenatally alcohol-exposed, and of those with FASD. Data from a large clinical database documents that the majority (82.6%) of young children (birth to 8 years) born prenatally alcohol-exposed, and those with FASD, whether they lived with birth, adoptive or foster parents, had clinical rankings of either "high" or "some" postnatal psychosocial risk [6]. Research also shows that prenatal alcohol exposure is highly associated with known postnatal environmental risk factors such as maternal drinking, care giver depression, and child maltreatment among birth parents at high psychosocial risk [56]. Developmental theory clearly states that children's outcomes are affected by an accumulation of risk from both biological and environmental factors. The problems experienced by children affected by prenatal alcohol exposure, or with an FASD, are the result of what has been called 'double jeopardy' coming from a mix of biological and environmental risks.

EARLY IDENTIFICATION OF CHILDREN BORN PRENATALLY ALCOHOL-EXPOSED

If intervention is to be provided as early as possible, there must be effective methods to identify young children with prenatal alcohol exposure. Preferably early identification would even pick out those who will later show effects of this exposure, and a diagnostic condition in the category of FASD. However, early identification is a challenge for many reasons. Unfortunately, passive identification systems such as birth defect registries do not include documentation of prenatal exposure. Providers in many settings where young children are seen (such as hospitals or early intervention programs) still miss infants and young children with characteristic facial features, and questions about prenatal alcohol exposure are not always asked. Innovative active identification systems are being tried, such as screening of digital facial photos for FAS features in young foster children in the U.S. [57] or experimental work on computerized 3-D modeling of facial features, but few children are screened at present. In countries such as Italy and South Africa, children are being screened in primary schools for possible effects of prenatal alcohol exposure [58,59], but this still misses very young children.

Research provides guidance on methods for detecting at-risk drinking. This is one way there can be very early identification of affected babies, or even detection before a child is born, although the practical value of these methods must be determined. Coles and her colleagues [60] examined the relative usefulness of several methods that could be used in neonatal healthcare settings to identify low birth weight children considered at-risk (because of prenatal substance exposure) to show developmental problems in the first year of life. While all methods were useful, the most sensitive and specific method was a 17-item maternal risk index of primarily substance use indicators, even though this method did lead to “false positives” (children identified as at risk even when they were not).

More recently, Chiodo *et al.* [61] set out to find detection methods useful during pregnancy that could predict learning problems presumably related to prenatal alcohol exposure in older preschoolers. The most useful method was a simple metric that defined a woman as ‘at risk’ if there was a ‘yes’ answer on any of several indices of self-reported maternal alcohol drinking during pregnancy (each considered a standard definition of ‘at risk drinking’). The researchers recommended that clinical suspicions or positive screens be followed up with thorough assessment of drinking patterns and consequences. They also suggested their metric might improve how prenatal alcohol exposure is defined when children are examined in FASD diagnostic settings.

Early identification of young children affected by prenatal alcohol exposure needs to be folded into community practice. Although there has been progress, it is remarkable (and unfortunate) that questions about prenatal alcohol exposure are not routinely part of the standard of care for young children in settings where such questions could easily be asked, such as maternal-child health centers, parenting programs, or childcare centers. Providers caring for young children are not well-trained to recognize the physical or developmental indicators of alcohol effects. Changes are needed in professional practice.

Based on review of a large clinical database, Olson and her colleagues [6] pointed out that traditional indicators of problems in infancy, such as preterm birth, are not necessarily seen in children who are diagnosed with FASD up to age 8. The usual brief developmental screening methods used in early intervention, and even longer individually-administered developmental tests such as the Bayley Scales, may miss many children who later show the teratogenic effects of alcohol. When prenatal alcohol exposure is known, these researchers suggest that subtle facial features, microcephaly (small head size), mild growth impairment, subtle indicators of sensorimotor problems, and even behavior regulation problems may actually be more useful indicators for an FASD diagnostic referral than test scores. These indicators are not always recognized by those in early intervention settings.

Training is needed so early intervention providers can better carry out early identification of children affected by prenatal alcohol exposure. These providers also need clear guidance about what to do after questions are asked, and where to refer for FASD diagnosis. A list of training topics for early intervention providers is linked to this chapter (Appendix 3). Providers also need information about promising early interventions so they can do treatment planning. To that end, a variety of treatment recommendations and description of promising intervention approaches are discussed in the remainder of this chapter.

TREATMENT RECOMMENDATIONS FOR YOUNG CHILDREN DRAWN FROM AN FASD CLINICAL DATABASE

A statewide FASD diagnostic clinic network, called the Fetal Alcohol Syndrome Diagnostic Prevention Network (FAS DPN), has been operating since 1993 in Washington State. Over the years, a recommendations database based on expert opinion has been developed by the FAS DPN interdisciplinary professional teams. Delving into this database through record review, Jirikowic and her colleagues [62] described the most common referrals and recommendations received by 120 families of newly diagnosed children with FASD (age range: 0.2 to 16.5 years old).

Recommendations for social services were made for almost 90% of the families raising infants and toddlers (0-2 years). These services included family support programs/funding or advocacy for permanency placement. About 75% of these families received recommendations for family resources, such as parent support and education groups, advocacy training, care giver respite and self-care, and educational materials for self-help. Families with preschoolers (3-5 years) were more likely to receive recommendations for behavioral intervention than were families with younger children. It is important to note that behavioral intervention or learning accommodations were

recommended for 50% of the overall sample of children birth to 16 years, showing the importance of these interventions. About 66% of families raising preschoolers received suggestions for anticipatory guidance (planning ahead for developmental and educational challenges) and developmental therapies (such as occupational therapy and speech-language therapy) [62].

FAMILY WISDOM ABOUT INTERVENTION FOR YOUNG CHILDREN AFFECTED BY PRENATAL ALCOHOL EXPOSURE

There is a growing body of observations by families and clinicians that provides crucial information about useful interventions for young children affected by prenatal alcohol exposure, or with FASD. However, these observations have not yet been validated through research. In town hall meetings held across the U.S. in 2002 and 2003, families and other participants identified two primary service needs across all family types (and across all ages of alcohol-affected individuals). Respite care was one basic need. Another was the need for all systems of care for children and families to understand FASD and provide appropriate services for this condition [55-63]. While the availability of respite care is still a problem, there is increasing availability of education on FASD for professionals in all systems of care. For instance, in the U.S. the Centers for Disease Control and Prevention have created a system of regional FASD training centers (http://fasdcenter.samhsa.gov/documents/Flyerfasd_RTCs.pdf) [64]. Around the world, there is a growing awareness of FASD through governmental education efforts, websites from parent organizations, and guidelines being developed by professional organizations.

A recent source of family wisdom on intervention comes from informal review of parenting forums, newsletters, and comments from support groups. This type of review was conducted over an 8-week period in 2009 for this chapter in order to find important trends in intervention for young children (*sources: FASlink [65]; Arctic FASPRTC [66]; NOFAS Parent Support Group [67]*). The review revealed that in these venues care givers often share experiences of parenting stress, and make efforts to find and partake of social support with other parents having similar problems with their young children. These trends fit well with data from the larger developmental disabilities literature indicating that informal social support, which often provides emotional support and practical childrearing input, is a form of intervention—and a powerful predictor of positive family and child outcome (Appendix 1).

In these parent support venues during the 2009 review, care givers shared ideas that are presented in italics below. They discussed *how to deal with the difficult behaviors* of their young alcohol-affected children and *how to manage care giver stress*. Frequently discussed interventions for the home centered around accommodations, or changing the environment so children's behavior is more functional (e.g., clear the child's room of everything but the essentials like a bed and blanket), and families seemed interested in these home adaptations. Parents offered advice to each other on *specific parenting techniques*, such as limiting verbal instructions when managing behavior and using repetition to help children learn, and hearing about strategies that work seemed to help families feel more confident and effective. Parents described trying to *help their young child identify their own feelings and how others feel*. Many parents posting on these listservs seemed to understand *how to deal with the sensory needs of young children* affected by prenatal alcohol exposure. Families appeared interested in finding *strategies to help their young child calm down*. Parents also seemed interested in *assistance with advocacy for their young child's educational rights*, and *help in explaining their child's special needs to those not informed about FASD*. There was strong *encouragement to stay hopeful and optimistic in parenting*.

This family wisdom informed the authors' selection of the scientifically validated early intervention approaches discussed next in this chapter.

RELATIONSHIP-FOCUSED EARLY INTERVENTION

Developmental research shows there can sometimes be significant problems in the early relationships between infants and toddlers affected by prenatal alcohol exposure and their primary care givers. This means that strategies to support and improve the early parent-child relationship are important interventions for them. The developmental literature offers several useful approaches.

First, because stable care giving environments lead to improved child outcome, a successful and efficient permanency planning process in the child welfare system is one important intervention. This process helps young

children born prenatally alcohol-exposed move to stable adoptive homes. Alternatively, this process helps young children live in a more stable home because birth parents enter into recovery (perhaps because of motivating ‘windows of opportunity’ created by awareness of their child’s exposure or diagnosis). Placement stability can create a more positive life trajectory for the child.

Second, relationship-focused interventions used early in life can help improve security of attachment—and also promote mutual regulation between parent and child, or the way in which parents and children interact together and stay in a calm and responsive state. For birth families, when needed, relationship-focused early intervention can be paired with parental depression and/or addiction treatment, to help birth parents become more sensitive and responsive care givers for their alcohol-affected young children. There are various types of relationship-focused interventions, including selected home visiting and infant mental health programs, discussed below and briefly presented in Table 5.

Table 5: Relationship-Focused Approaches to Early Intervention

| Selected Relationship-Focused Home Visiting and Infant Mental Health Programs |
|--|
| <ul style="list-style-type: none"> • <i>Nurse-Family Partnership:</i> Program of nurse home visitation that occurs prenatally and until the child’s 2nd birthday. Aimed to improve women’s prenatal health behavior and competent parenting during infancy and toddlerhood, and the life course development of the parent. • <i>Promoting First Relationships:</i> Prevention program of parent education and support for care givers raising children with special needs, based on attachment theory. Includes videotaping parent-child interactions, discussing these with positive comments to build care giver competence with and commitment to their children, and focusing on emotional needs underlying children’s challenging behaviors. Can be applied by early intervention service providers in multiple settings, or carried out in home visits. • <i>Circle of Security:</i> Group infant mental health intervention, with additional individual visits focused on the unique parent-child relationship using analysis and clinician-parent dialogue about video vignettes of the parent and child together. Provides psychoeducation and psychotherapy for families at high-risk, based on attachment theory. Designed to help care givers provide a ‘secure base’ or safe haven for their children. • <i>Child-Parent Psychotherapy:</i> Approach based on an integration of several theories for women at very high risk because of their own traumatic life experiences, often also including alcohol and drug abuse. Longer-term and more intensive therapy, with multiple components that focus on building a sense of trust and safe intimacy between parent and child. Includes helping parents understand their own viewpoint and their infant’s distinct viewpoint, and build mutual understanding. |

Relationship-Focused Home Visiting Programs

There is a great deal of literature on the impact of relationship-focused home visiting programs for parents raising infants and very young children. In these programs, a home visitor comes on a regular basis to the home of a parent with a new child, usually for at least a year. In 2000, Olds and colleagues [68] comprehensively reviewed these programs, which ranged widely from nurse visitors calling on pregnant and early parenting women at high risk (low income, unmarried, and/or first-time adolescent parents), to trained paraprofessional visitor programs. There were also programs in which home visits were made by professionals to families at risk for various reasons (such as high psychosocial risk, adoption, at risk for attachment disorders, or chemical dependency), and more. According to Olds *et al.* [68], not all home visiting programs are efficacious. They did find that home visiting services for parents with young children vulnerable because of low birth weight, illness or disability appear to be useful when programs are well-designed and well-conducted. They also found that home visiting programs carried out by professionals, guided by specific, carefully thought-out procedures grounded in theory on parent-child attachment, have shown beneficial effects on infant attachment. Olds and his colleagues have found long-term positive benefits of some home visiting programs for children and their parents. Specifically, they have found the *Nurse-Family Partnership* to be a useful and effective program [68,69].

Stern [59], a developmental researcher, has summarized information about home visiting programs. He noted that good quality home visiting programs seem to have a wide variety of positive effects. These include improvement in sensitive maternal behavior, richness of the parent’s perception of the child, maternal mood, and healthy life choices. Stern noted

that a more effective home visiting process seems to have several characteristics. This includes visits that occur at regular and frequent intervals, programs that start in the 1st month (or even before the baby is born), and careful pre-training and regular supervision for home visitors. Stern points out that home visitors are often mature women. Based on this and other observations, he notes that treatment effects may partly come from specific intervention techniques, but may actually arise mostly from therapeutic, ‘non-specific’ effects of the good quality relationship that is built between the home visitor and (usually) the mother. Stern theorizes that this visitor-mother relationship can actually be viewed as providing a secure attachment and ‘holding environment’ for the mother.

Lyons-Ruth and Easterbrooks [70] have tried to look at the effects of early home visiting over time. In their research, they looked at children’s outcome at 18 months, 5 years and 7 years. They found there was no evidence of an “inoculation” effect of home visiting for an *individual* child. For *groups* of children (as a whole), however, they did find that good quality home visiting had positive effects later in life. The patterns of intervention-related effects over time were complicated. A pattern emerged showing that early home visiting services shift family dynamics of highly stressed families, and act to prevent a downward spiral. Their data suggested this was true only when services were intensive and lasting. Less intensive home visiting programs did not seem to have this result. These researchers also found a second pattern in their data. In this pattern, home visiting services in infancy and toddlerhood seemed to set in motion a better family process that evolved over time, continuing to have positive effects at each phase in development (even when there were episodes of difficulties with the child).

This research suggests that early home visiting programs may be useful for infants and toddlers affected by prenatal alcohol exposure, who are biologically vulnerable and may show disabilities. If home visiting programs are used, they should be well-conducted, carried out by well-trained, supervised home visitors, and (in these early years) likely grounded in attachment theory. Highly stressed families will probably benefit the most, but services to these families should be intensive and long-lasting. The effects may appear as a slowing of a downward spiral, and/or may have periodic positive effects at different developmental stages over time. Individual children and families may not always show the positive effects that are seen when looking at the group as a whole.

Infant Mental Health Interventions

Interventions taking an ‘infant mental health’ perspective are usually grounded in attachment theory. These interventions typically aim to improve attachment security between the young child and primary care givers, and improve the process of ‘mutual regulation’ between parent and child. Infant mental health interventions are typically applied in the first three years of life (and usually started in the child’s first or second year). Some of these interventions are home visiting programs. All these programs are designed to lay the foundation for better mental health in childhood and beyond.

In infancy, these relationship-focused interventions help parents learn how to be sensitive and responsive to their baby. Parents are taught how to read their very young child’s cues and appropriately soothe distress. In toddlerhood, these interventions help parents understand how to provide a ‘supportive presence’ and ‘secure base’ to their toddler, who is learning to be more independent and striving for mastery and competence. Parents are taught how to let their child try out things on their own (and make mistakes), but still assist, soothe and protect their child just enough to let them learn and be independent while staying safe and secure. Infant mental health interventions often also aim to help parents understand the viewpoint of their child, and develop positive perceptions (‘relational schemas’) about the parent-child relationship.

Infant mental health interventions have the goal of creating warmly engaged parent-child relationships and, as children grow older, the added goals of promoting proper limit-setting and monitoring provided by parents. If well supported, the underlying ideas are that, over time, the young child moves from care giver-imposed regulation to good ability to self-regulate and an improved ability to comply with parent instructions. Over time, if well supported, young children also learn and begin to follow social rules, both when guided by their parents and (eventually) on their own. Achieving all these developmental goals may be a harder process for children affected by prenatal exposure to alcohol. Because of this, they may need much more support. Infant mental health interventions can help care givers provide better support for their young alcohol-exposed children.

Infant mental health interventions can also help care givers understand how to use special environmental accommodations for young children who have biological vulnerabilities. One example is using less stimulating ‘vertical rocking.’ This is a technique in which a baby is held and rocked vertically, facing away from the parent (which can be calming), rather than in the usual rocking posture in which a child is cradled in a parent’s arms and held face-to-face. In general, accommodations can be used to help children prone to arousal regulation problems, including those affected by prenatal alcohol exposure, avoid overstimulation and achieve better regulation of their ‘state’ (wake, sleep, distress, etc.).

A wide variety of infant mental health interventions exist, and books are available that discuss the broad scope of the field [71]. See Table 5 for a listing of a few of these intervention approaches that might be useful for families raising infants and toddlers with prenatal alcohol exposure, although there are other possibilities. Most likely, any of these interventions would need to be combined with care giver education on FASD and related topics. There are attachment-based infant mental health interventions such as *Promoting First Relationships* [72], *Circle of Security* [73-75], or others [76,77]. Some of these interventions are aimed at mothers at very high risk because of their own traumatic life experiences, often including substance abuse, such as *Child-Parent Psychotherapy* [78-80]. Some infant mental health approaches address various child mental health problems, such as attachment disorders [81] or depression [82], which may be co-morbid conditions experienced by young children with FASD. Many of these interventions take place through home visiting or bringing families into mental health clinics. But there are also approaches that integrate infant mental health interventions into settings already attended by young children with prenatal alcohol exposure. These settings range from Early Head Start, to substance abuse treatment programs for parents [83], to case management programs for very high-risk women with chemical dependency who are parenting young children who were born drug-exposed [84].

There are data to support the efficacy and utility of the various infant mental health interventions discussed above. However, while these interventions have been used for populations that undoubtedly include children born prenatally alcohol-exposed, no data are yet available showing efficacy for use specifically with children identified as prenatally alcohol-exposed, or with FASD. The wide range of infant mental health interventions are well-suited for matching to the diversity of families raising children affected by prenatal alcohol exposure. The particular technique(s) chosen should be matched to care giver needs (such as history of parental chemical dependency, or presence of maternal depression), severity of neurodevelopmental delay observed in the child, and co-morbid conditions (such as child attachment problems or evidence of childhood depression).

Tests of promising infant mental health interventions are an especially high priority for research on early intervention with infants affected by prenatal alcohol exposure. Research examining the efficacy of infant mental health interventions has begun, led by researcher Paley and her team. One good candidate for research is an intervention called *Promoting First Relationships* [72], which can be delivered in multiple settings, is easily adapted for children with special needs, and can be used with families at high risk. There are also interesting interventions developed for children with autism spectrum disorders that could be tried out with young children affected by prenatal alcohol exposure. Another research priority is to carry out ‘secondary data analysis’ in more general studies of the effectiveness of infant mental health interventions. This could be done by identifying the children with prenatal alcohol exposure already being served, and comparing their outcome to non-exposed children receiving the intervention.

Interventions Designed for Children with Autism Spectrum Disorders

It is beyond the scope of this chapter to discuss all that has been learned from the study of intervention for children with Autism Spectrum Disorders (ASD), another important neurodevelopmental disability. However, several points drawn from a recent review of ASD interventions help in thinking about early intervention for FASD [85]. First, entry into treatment immediately after diagnosis (or when identified as high risk) has been nationally recommended for ASD. This also seems crucial for children born with heavy prenatal alcohol exposure or FASD. Second, an intervention recommendation for ASD is the creation of ‘natural environments,’ such as school and home, that build on strengths and compensate for deficits. From a neurodevelopmental viewpoint, this might be rephrased as working hard to provide ‘accommodations’ for children at home and at school, also thought to be vital for FASD. A third intervention recommendation is the strong need for education and support for care givers raising children with ASD. This is also important in FASD intervention.

In recent years, there has been a major effort to carry out research on intervention for ASD, using a variety of promising models. A surge of intervention research is also crucial for the field of FASD. As discussed in the recent review [85], the strongest evidence in early intervention for ASD (so far tested for children of preschool age and older) supports the effectiveness of behavioral techniques, such as intensive, individualized behavioral treatment to improve cognitive skills [e.g., 86]. Adapted behavioral techniques are likely very useful for children with FASD, at least from the preschool years on. There are also non-behavioral intervention models for ASD that focus on social-emotional growth and other areas of development that have some evidence of effectiveness, such as the Denver Early Start Model [87]. Several of these interventions focus on teaching parents general principles related to the factors that are thought to influence how children with ASD learn. These approaches then provide training to care givers on how to plan ways to help their young children with ASD improve in important deficit areas for this disability. In the same way, it seems vital to develop interventions that help care givers raising infants and young children with prenatal alcohol exposure or FASD to ‘reframe’ and take a ‘neurodevelopmental viewpoint.’ They can then plan ways for how to help their youngsters improve behavior regulation and other individual areas of difficulty, and decrease challenging behavior. All this means is that innovative infant mental health interventions, and the ‘positive parenting interventions’ discussed in the next section, may have special promise for FASD intervention.

POSITIVE PARENTING INTERVENTIONS

The present chapter focuses on a selected set of scientifically validated parenting interventions that seem especially promising for FASD intervention from a neurodevelopmental viewpoint. The current authors term these “positive parenting “interventions. These scientifically validated interventions teach positive parenting skills, and methods for dealing with the challenging behavior that is common in FASD. One program is designed especially for this clinical population. Table 6 provides a brief summary of these selected interventions.

There are a variety of parent training methods and treatment elements available, including those primarily developed for young children at risk for (or with) disruptive behavior disorders or ADHD, or focused on promoting school readiness. Appendix 4 has examples of evidence-based parenting interventions not covered in this chapter. With careful adaptation, these types of approaches might be useful for children affected by prenatal alcohol exposure. However, these approaches may not work well as stand-alone treatments, and it is important to note that the evidence base for these programs may not have included children with neurological impairment.

Table 6: Positive Parenting Interventions for Use with Families Raising Young Children

| Selected Positive Parenting Interventions |
|---|
| <ul style="list-style-type: none"> • <i>Families Moving Forward Program:</i> Individualized behavioral consultation intervention designed for families raising preschool and school-aged children with prenatal alcohol exposure or FASD and behavior problems. Combines motivational interviewing techniques with care giver education, support and skills-teaching. Aims to have care givers take a neurodevelopmental viewpoint and use positive behavior support. Also provides targeted school and provider consultation, and linkages to community services. Delivered by specially trained clinicians in home or clinic visits. • <i>Family Check-Up Model:</i> Prevention program designed for families at high psychosocial risk. Combines motivational interviewing techniques and promotes parent use of positive behavior support in visits at strategic developmental timepoints. Tested so far at the toddlerhood and preschool ages. Linked to an individually variable amount of customized parenting support services. Delivered by specially trained parent consultants in a variety of settings. • <i>Triple P Stepping Stones Program:</i> Group parenting education program with some individual home observation sessions, used with families raising toddlers through young school-aged children with developmental disabilities. Based on behavioral family intervention and parent management training. Uses video vignettes of a variety of child management techniques, with discussion and some individual treatment planning. Delivered by specially trained clinicians in clinic settings and at home. |

Positive parenting interventions are useful in the early years, starting in preschool, and across the years of childhood (principles from positive parenting interventions are even being adapted into interventions for adolescents and young adults with FASD) [88]. These interventions fit very well with the neurodevelopmental viewpoint. They take into

account “brain-based difficulties” by focusing less on consequences for misbehavior, and more on how parents and teachers can set up home and school environments in which a child with special needs can be more functional. They teach useful parenting practices for children with developmental disabilities or high psychosocial risk. There are a few positive parenting intervention programs useful for families with young children. One was developed especially for parents raising children with FASD and behavior problems [5, see Study #5]. These positive parenting interventions were developed over about the past decade, and (in the time frame of treatment research) are relatively new.

The Families Moving Forward Program

The Families Moving Forward (FMF) Program is a positive parenting intervention, developed by Olson and colleagues [5, 89-92]. The FMF intervention model was designed specifically for the high priority group of families raising children with preschool and school-aged children with FASD, who also have clinically concerning behavior problems. This is a large segment of families who come into FASD diagnostic clinics or are seen in mental health settings. These children have low adaptive function and very high levels of behavior problems, and their care givers are nearly all highly stressed by the task of parenting children with FASD. These are children with very challenging problems.

The FMF model is a behavioral consultation intervention that combines a positive behavior support (PBS) approach with motivational interviewing and other scientifically-validated treatment techniques. The FMF intervention is specialized for families raising children with FASD, though it is likely useful for children with other neurodevelopmental disabilities. The FMF intervention is delivered individually to families by clinicians who have received specialized training on the model, and have access to supervision/consultation. There is a manual for the FMF intervention, but the intervention is also flexible enough to respond to the needs of the very diverse population of children with FASD and their families. The FMF intervention can be used for children aged as young as 4 years to as old as age 12 years (at the start of intervention). The efficacy of FMF services has been tested as home-based counseling delivered from a university setting and later by a community agency, with promising results so far. Delivery in clinic settings has also been tried and is quite feasible. The FMF Program has been designed to be affordable, and is now being disseminated to community agencies that have a special commitment to serving children with neurodevelopmental disabilities or FASD.

In the FMF intervention model, care givers are offered support and education, sustained behavioral consultation that includes coaching on skills, targeted school and provider consultation, advocacy assistance, and connection to community linkages. There is a strong emphasis on emotional support for care givers who must adjust to a disability that is often unrecognized by social systems, teachers and even health care providers. Other ‘optional’ treatment elements can be added, such as finding respite care or learning how to explain an FASD diagnosis to a child. Receiving FMF services does not preclude other services, and the FMF intervention model actually emphasizes links to other community resources.

The FMF Program is a care giver-focused intervention, designed to be used with families experiencing high care giving stress. Data on the FMF Program were gathered with the intervention offered in biweekly visits, usually each visit about 90 minutes long, occurring over a period of 9 to 11 months [5]. Recent experience suggests a somewhat shorter duration with more frequent visits is feasible, though no outcome data have been gathered. There is a highly collaborative and equal relationship between parent and professional (FMF Specialist).

The entire FMF intervention takes a neurodevelopmental viewpoint. A first aim of the FMF Program is to help parents “reframe” and understand their child’s neurological impairment and ability to process emotions, changing attitudes in a more positive, realistic direction. A second aim is to help parents learn skills for how to come up with and use accommodations, such as modifications to the home or classroom. A third aim is to help parents learn how to set up practical behavior plans to reduce self-selected behavior problems. These plans rely less on setting up consequences for misbehavior. Instead, behavior plans rely more on parents thinking about the triggers and circumstances surrounding their children’s problem behavior, and how to change them so the child’s behavior problems decrease and the child acts in a more functional way. The idea is for parents to learn how to create behavior plans, so they have strategies to use in the future when new problem behaviors crop up. Parents receive a customized workbook, and do regular home activities to practice new skills and attitudes.

The FMF Program has been tested in a randomized control trial, and in a community-based efficacy trial just completed. More detailed results are presented in presentations and articles published or in preparation so far [5, 89-92]. The initial efficacy study compared two groups of families raising children with FASD and behavior problems randomized to receiving: (1) FMF services; and (2) the community standard of care. Families were very diverse in terms of ethnic background, social class, income level, and type of family structure (adoptive, birth, foster; grandparents, single parents, two-parent families). Immediately after treatment, relative to controls, findings showed the FMF group reported significantly greater family needs met, a greater sense of parenting efficacy, more parental self-care and decreased child disruptive behavior. While not all hypotheses were confirmed, parents reported high satisfaction with treatment, and both parents and clinicians reported good treatment acceptability. Treatment compliance was excellent, with 96% of families completing the basic intervention in this first efficacy trial.

More studies of the efficacy of the FMF Program are underway, with results in a community-based trial that are also promising and appear similar to the initial controlled trial. Treatment compliance in the community setting was about 86%. For more information, see the Families Moving Forward website: <http://depts.washington.edu/fmffasd> [81] and future publications.

The Family Check-Up

The Family Check-Up [93,94] is a positive parenting intervention that focuses on preventing problem behavior and negative interaction styles in families at high psychosocial risk. The goal of this intervention model is to support parents in a family-centered and ‘ecologically-focused’ manner. Like the FMF model, the Family Check-Up also uses motivational interviewing and strengthens parents’ use of positive behavior support strategies. This model is delivered by specially trained parent consultants, and is linked to a variable amount of additional parenting support services customized for the family. The model was designed to be embedded into existing service systems, such as public school settings, and to be delivered at four transition time points in development. This model has so far been tested in the very early years, at the toddlerhood and preschool timepoints. There are promising results showing improvements in care giving skills and decreased child behavior problems [93].

The neurodevelopmental viewpoint suggests that the Family Check-Up model would likely not be intensive enough for most families raising children affected by prenatal alcohol exposure, even in the early years, unless sufficient follow-up parenting support sessions were provided. This type of follow-up appears to be possible in an extended version of the Family Check-Up model. This model would have to be adapted to offer specific information about FASD, work on acceptance of the task of raising a child with a disability and slower developmental progress, advocacy, and other topics important to families raising children with neurodevelopmental problems. Secondary data analysis would be useful to see if the Family Check-Up model holds promise for this clinical population. This analysis could identify children affected by prenatal alcohol exposure, and their families, who receive the Family Check-Up Model, and then examine their outcome compared to the larger group.

Stepping Stones Triple P Program

The Stepping Stones Triple P Program is also a positive parenting intervention, designed generally for young children with developmental disabilities and their families [95-97]. The age range tested so far is from 2 to 7 years (but has been extended up to children aged 9 who may be lower functioning). This intervention is based on principles of behavioral family intervention and parent management training. Parents learn to respond in a planned manner to their child’s behavior and set up activities to minimize chances for disruptive behavior.

The Stepping Stones Triple P intervention was adapted from the evidence-based Triple P Positive Parenting Program. Adaptations included making content and materials more sensitive to families of children with disabilities, and covering additional issues relevant to this type of parenting (e.g., adjusting to having a child with a disability). Another adaptation was adding to the curriculum information about causes for behavior problems beyond those seen among children who are typically-developing, such as communication problems or disruptive efforts by the child to stop a disliked activity. Behavior change protocols for common problems associated with developmental disabilities (such as self-injurious behavior, or eating non-food substances) were included. Clinicians receive extensive specialized training and regular supervision.

The Stepping Stones Triple P Program is delivered in two-hour-long sessions. The 10-session curriculum includes examining causes of child behavior problems, and providing information on strategies for: developing positive relationships; encouraging desirable behavior; teaching new skills and behaviors; and managing misbehavior. Care givers receive a family workbook and watch videotaped demonstrations of positive parenting skills. Parents self-select goals and strategies to practice in clinic and several home observation sessions. In the original efficacy study, families with additional needs were offered additional sessions beyond the basic program to cover either Partner Support (marital communication and parenting teamwork) and/or Coping Skills (mood management and coping skills).

In a randomized control trial, an intervention group was compared with a waiting list control. Participants were preschoolers (up to age 7 years) with behavior problems and various developmental disabilities (none specifically identified as affected by prenatal alcohol exposure, or with FASD). When families had additional needs, the intervention included additional sessions offering training on partner support and/or coping skills for families with additional needs. Results were promising. The Stepping Stones Triple P intervention was associated with reduced child behavior problems as reported by mothers and independent observers, improved maternal and paternal parenting style, and decreased maternal stress. Some effects were maintained at 6-month follow-up. Families were well satisfied with treatment [95].

Further testing compared use of the Stepping Stones Triple P Program with and without the enhancements of parent coping skills, relative to waiting list controls. Participants were again families raising preschoolers (up to age 5 years) with developmental disabilities and behavior problems, who appeared to have milder adaptive behavior deficits than did participants in the earlier efficacy trial. Both the basic and enhanced interventions were equally effective, so there was no evidence that adding adjunctive treatment was superior to the standard behavioral training. After treatment, there were lower levels of observed negative child behavior, reduction in the number of care giving settings where children showed problem behavior, and improved parenting competence. No changes were seen in parent mood or couples adjustment. Families were again satisfied with treatment. Gains were maintained at one-year follow-up [96]. The Stepping Stones Triple P Program has also very recently been tested with families raising children aged 2 to 9 years with autism spectrum disorders, with significant improvements in parent-reported child behavior and parenting styles that were maintained over a 6-month follow-up [97].

INTERVENTIONS DRAWN FROM THE CHILD MALTREATMENT AND RESILIENCE LITERATURE

Young children affected by prenatal alcohol exposure, or with FASD, often experience psychosocial risk and sometimes actual maltreatment. Studies have shown that children with FASD and maltreatment have less positive outcomes than those who are not maltreated or victimized [1,98]. This means that appropriate maltreatment interventions are important for this population of young children. Federal laws passed in 2003 require infants and toddlers substantiated for maltreatment to be referred for early intervention under special education laws. Only a few children with maltreatment who were referred in this way showed a clear risk condition mandating services (3%). However, the most common ‘established risk condition’ making them eligible for early intervention services was FAS [99]. Interventions for maltreatment should be chosen carefully for young children with prenatal alcohol exposure and maltreatment, and Table 7 provides some useful intervention ideas.

In research on child maltreatment, there are various approaches including intensive family preservation services. For the children themselves, common interventions studied are consequence-based behavioral training methods that focus on reducing the occurrence of undesirable behaviors. Typically these are ‘token economy’ reinforcement systems (giving children chips or stickers for positive behavior so they can save up to earn rewards). While these strategies are useful for children of school age, they may not be developmentally appropriate for young children, or those with delays or neurological impairment such as children with FASD, who do not fully understand the idea of saving for a reward.

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT), which is primarily aimed to children 10 years and older [100], is a well established, evidence-based intervention model. TF-CBT can be used with children as young as age 7 years, if developmentally modified, but may be hard to use with young children and/or those who have brain-based difficulties. This means that only certain treatment elements from TF-CBT may be useful, such as teaching children simple relaxation skills and ways to repeatedly practice becoming desensitized to trauma.

Table 7: Intervention Ideas Drawn from Child Maltreatment and Resilience Research

| Useful Intervention Ideas |
|--|
| <ul style="list-style-type: none"> • Teach relaxation skills and other desensitization skills in a simple way. • Use bibliotherapy (reading developmentally appropriate books on trauma topics and coping methods, and then talking with the child at their functional level in ‘child-led’ discussion). • Teach children concrete skills, such as “the rules of touching” or appropriate friendship skills (this might include using the Social Stories method). • Teach children important concepts related to maltreatment, such as the fact that the child is not alone in experiencing maltreatment, and that there are rules about people not hitting each other. • Provide care giver education and consultation to schools related to child maltreatment. • When appropriate, teach all care givers involved techniques to deal with reactive attachment disorder. |

One recommended approach using these and other TF-CBT treatment elements starts with parent-assisted ‘biblio therapy’ where parents help children think about maltreatment, and teach children methods of child relaxation and coping, through examples in books. Reading these books can be followed by child-led discussion of trauma experiences, at times when the child spontaneously brings up the topic and during parent-child relationship-building activities. Importantly, child-led discussion can be paired with building a family ‘narrative’ that explains what happened. The parent can use this narrative to interpret the maltreatment experience to the child over a long period of time, gradually helping the child to create a new and healthier understanding of the experience. Parent involvement assumes that parents are not part of ongoing maltreatment and, if needed, are on their own path to addiction recovery and improved mental health.

Concrete skill-building may also be useful, directly teaching young children skills such as how to: start conversations; appropriately show affection; keep up personal space; ask for help appropriately and assertively; tell the difference between safe secrets and unsafe secrets; and so on. Another method is ‘pre-teaching,’ or using role-play with adults or coaching during peer interaction, to help young children learn important ideas such as the ‘rules of touching.’ The “Social Stories” method (discussed later) may also be helpful. To be effective with young children affected by prenatal alcohol exposure, these skill-building methods should be ‘adult-assisted.’ Care givers learn the methods, and then assist young children in using the skills over time and in real life. This brings learning as close as possible to the actual life situation and provides children with chances for repeated practice. Positive parenting interventions are also useful for children who have been maltreated.

No matter what therapeutic approach is used, there are important basic concepts to keep in mind when responding to child maltreatment. These ideas should be conveyed to the young child who has experienced maltreatment, and to their parents who can help the child understand these ideas over time. The first set of concepts is that the maltreatment experience does not mean the child is unique or alone, and that other children have experienced bad or frightening things and also may have reactions or problems because of this. The second set of concepts is that there are rules that “it is not OK for parents to hit”, and “it is not OK for children to hit others”. Consultation with the school or early intervention setting is important, and should focus on teaching providers about maltreatment, and on the importance of not isolating the child from their peers even if the child shows difficult behavior.

Some young children who have experienced maltreatment show diagnosed Reactive Attachment Disorder (RAD). When children show RAD, especially when they also have neurological impairment such as that seen in FASD, their intervention progress may be very slow. Care givers can still learn and use the skills discussed above and skills for how to respond when the child’s behavior problems or anger escalate. Any approach to intervention with RAD should involve care giver consultation to go over the symptoms of RAD, the need for patience, coaching on how to prevent “indiscriminate” attachment behaviors (such as hugging everyone), and the probability that the child will only show slow change. It is vital to help care givers develop realistic expectations about what child symptoms and behavior problems are likely to change in response to treatment, and to sort out what issues may remain unchanged and so best be dealt with through accommodations.

SKILLS TEACHING WITH YOUNG CHILDREN TO IMPROVE BEHAVIORAL REGULATION AND RELATED SKILLS

Some early intervention methods improve later outcome by actively developing young children's self-regulation and related cognitive skills. This type of intervention is crucial. This is because young children affected by prenatal alcohol exposure often have difficulties with behavior regulation and stress reactivity, starting in early infancy. They also show lasting deficits in higher-order cognitive skills (executive functioning) that heighten the stress their care givers feel, and negatively affect other areas of their development.

For younger children with prenatal alcohol exposure, the most useful skills teaching programs are likely those in which children interact in groups. Treatment in groups allows young children to learn skills while involved in 'real life' social interaction with peers, typically accompanied by practice supported at school by their teachers and/or at home by their parents. In this child population, skills may best be learned through direct teaching [5]. For example, parent-assisted friendship skills training aims to help children learn concrete skills important to positive peer relations, and has been shown to have sustained effectiveness with children with FASD as young as age 6 years by O'Connor *et al.* [51]. (The chapter in this book by Coles and colleagues describes this and other child skills teaching programs useful for children with FASD who are somewhat older).

Two selected evidence-based group intervention models that use direct skills teaching, and one flexible intervention method, are discussed below. These are appropriate for younger children. While there are other programs, the authors consider those discussed here to be promising direct treatments for young children affected by prenatal alcohol exposure. However, each may need to be adapted to be most effective with this population. The two programs discussed below were designed for children at risk for or diagnosed with disruptive behavior disorders, but are also often useful for children with internalizing problems. These two programs aim for improvements in child social cognition, social competence, and 'executive functioning,' in an attempt to reduce child behavior problems or promote behavior regulation. Table 8 briefly lists these selected skills-teaching interventions.

Table 8: Skills-Teaching Interventions for Young Children to Improve Behavioral Regulation and Related Skills

| Selected Interventions |
|--|
| <ul style="list-style-type: none"> • <i>Incredible Years-Child Training:</i> Videotape-based curriculum for children in preschool and early elementary school used in groups to teach problem-solving and social skills. • <i>Promoting Alternative Thinking Strategies (PATHS) Program:</i> Classroom instruction in social-emotional skills used for groups of children in preschool and early elementary school. • <i>Social Stories Method:</i> A direct skill-building method in which little customized books or cartoons are created for an individual child. These Social Stories are written at the child's developmental level and are individually created. The Social Stories visually show children steps for how to solve specific life skill problems, including particular social situations. |

The Incredible Years Child Training Program (IY-CT)

The IY-CT Program is an 18-22 week videotape-based curriculum for 3 to 8-year olds who meet in small groups of 6-7 children with two therapists for two-hour weekly sessions [101]. Children view a wide variety of videotaped real-life vignettes filmed in home and school settings that model child problem-solving and social skills. After watching the vignettes, children are led by group leaders (sometimes using puppets) in discussion of feelings, generating ideas for more effective responses, and role-playing alternative scenarios. There are also group activities, reinforcers for participation, and workbooks to take home. The IY-CT treatment meets scientific criteria for a 'probably efficacious' treatment for children with disruptive behavior when delivered on its own (e.g., [101,102]). However, the IY-CT treatment is usually delivered in association with the Incredible Years-Parent Training (IY-PT) Program. The IY-PT Program (see Appendix 4) is another interesting parenting intervention to examine, although as a group intervention it may be less feasible for FASD [103].

Aspects of the IY-CT program are well-suited to children with FASD or affected by prenatal alcohol exposure, including the use of observational learning, puppets to enhance child interest in discussion, adult assistance, small

groups so that peer rejection is not a problem, and role-play with peers. The IY-CT program has not been tested with children with known FASD. Based on a neurodevelopmental viewpoint, it is possible that for this child population, the IY-CT Program might be less effective than expected. This is because of the issues of inattention and distractibility, difficulty generalizing information from one setting to another, and deficits in both integrative language abilities and working memory that characterize this population. Also, the increase in social cognitive skills targeted by the IY-CT Program might not lead to expected levels of decreased disruptive behavior because of the children's underlying neurodevelopmental disabilities. Adaptations may be necessary, such as viewing an increased number and variety of vignettes, more emphasis on role-play, or adding time to coach children through similar situations as they occur within the classroom or at home.

Promoting Alternative Thinking Strategies Program (PATHS)

The Promoting Alternative Thinking Strategies program (PATHS) involves theoretically-based classroom instruction in multiple social-emotional skill domains, such as emotion knowledge, self-control and calming, and problem-solving, delivered in a developmentally appropriate sequence. The curriculum is administered by trained teachers in 30 weekly sessions over the school year, in game, art, and reading formats. Goals are to increase social competence, reduce problem behavior, increase protective factors, and improve emotion awareness for the child and others [104]. Although developed for elementary-aged children, PATHS has been used with younger children. A randomized control trial of PATHS was recently completed for typically-developing children in 20 Head Start preschool classrooms [105]. In post-testing, children receiving PATHS increased their skills in emotion knowledge and emotion vocabulary more than controls. PATHS participants were more accurate in interpreting neutral emotions, rather than inaccurately seeing them as angry and attributing hostile intent. Teachers reported students involved in PATHS showed increased social skills and decreased internalizing problems and withdrawn behavior. Parents reported children receiving the intervention as more socially and emotionally competent, but did not report changes in externalizing or internalizing problems.

PATHS has also been tested in elementary school classrooms (1st to 3rd grades) for children with special needs. Kam and colleagues [106] evaluated the long-term effectiveness of PATHS used with a variety of children qualifying for special education services. They found substantial benefits from PATHS. Intervention was adapted to be delivered over a more intensive 60 lessons across a typical school year in nine classrooms (doubling the frequency of sessions), with a special education control group of nine classrooms. This likely meant increased practice and simpler delivery during lessons to teach component skills. Change over time was traced yearly for three years after intervention. Ratings of externalizing problems went down over time in the intervention group, while the same ratings went up over time for controls. In the intervention group, ratings of internalizing problems were slower to increase than were the same ratings for controls. For two years after treatment, this pattern of changes continued, with the intervention group improving and the control group showing increased problems.

Aspects of PATHS are well-suited to children with FASD or affected by prenatal alcohol exposure. PATHS is delivered in the school setting, which is a 'real life' natural environment for children. The intervention lasts the entire school year, follows a developmental sequence, and involves frequent 'teachable moments' in which teachers promote learning during structured social activities. This style of treatment delivery may foster initial learning and generalization of what has been learned for children with FASD. It may also capitalize on their apparently high social motivation. Also, PATHS outcomes of decreased anger and hostile attribution bias target an important deficit area recently identified among children with FASD [52].

However, PATHS has not been tested with this population. Children with FASD might show fewer intervention benefits, especially since it is known that children with better verbal abilities profit more from PATHS. Without adaptations to the curriculum, a neurodevelopmental viewpoint suggests that increased emotion knowledge may not result in expected levels of increased social competence and decreased problem behavior for children with FASD. Useful adaptations would likely include even more emphasis on role-play and teacher coaching, individualizing the curriculum when necessary, and employing those adaptations already discussed above that were used by Kam and his colleagues for children with special needs [106].

Social Stories

Social Stories are a direct skill-building method that may prove to be useful for younger children affected by prenatal alcohol exposure, perhaps especially when there has been child maltreatment. This method builds on the work being conducted with children diagnosed with autism (<http://www.thegraycenter.org/>) [107] and is used on an individual basis. Clinicians report Social Stories as very flexible and useful.

Social Stories are little customized books or cartoons for the child. Social Stories are written at the child's developmental level and are usually accompanied by pictures, drawings and/or words. Social Stories give children accurate information about situations they may find difficult or confusing. Using this method, a situation is described in child-friendly detail, such as what happens when other children refuse to play, what happens when inappropriate touching occurs, or even how to perform daily living skills. A Social Story focuses on a few key points: (1) important social cues; (2) events and reactions the child might expect to happen in the situation; (3) actions and reactions that might be expected of the child; and (4) why these might be expected. The goal of the story is to increase the child's understanding of the situation, increase the child's comfort level, and possibly suggest some appropriate responses to the situation in question.

Social Stories fit well with a neurodevelopmental viewpoint, as the stories provide visual, concrete stimuli to the child. Using Social Stories reduces demands on higher-level language abilities and working memory, and these stories can easily be geared to the child's developmental level. Examples can be found in the *New Social Story Book* [108].

EARLY INTERVENTION SETTINGS

Ramey and Ramey [109] have written about the characteristics of effective early intervention, primarily as these services relate to cognitive outcomes and school success. Intervention that begins earlier in children's development and lasts longer offers greater benefits to participants. Programs that are more intensive produce larger positive effects. Children receiving direct educational experiences show larger and more lasting effects than those that use intermediary routes, such as parent training, to impact children's competencies. More comprehensive and multimodal interventions generally have larger positive effects on children's development. Certain children show larger effects when given intervention, which seems to be related to their initial risk condition. Over time, initial positive effects of intervention will diminish, depending on whether or not there are adequate environmental supports available to maintain positive outcomes.

Table 9: Multi-Modal Early Intervention Programs

| Selected Interventions |
|---|
| <ul style="list-style-type: none"> • <i>Math Interactive Learning Experience (MILE) Program:</i> Multimodal intervention program with a cognitive habilitation basis and aimed to improve child behavior and math function. Includes parent training in workshops and individualized educational intervention for children. Parent and child support also provided to improve learning readiness in children [See chapter in this book by Coles and colleagues for more complete description]. • <i>Early Intervention Foster Care (EIFC) Project:</i> Comprehensive, intensive multimodal early intervention with an attachment theory basis. Provides ongoing foster parent education and consultation, individual therapy and playgroups for children, and linkage to needed community resources. • <i>Tools of the Mind Curriculum:</i> Preschool classroom curriculum designed to promote child self-regulation skills. Incorporates learning of self-regulation into pre-academic activities that promote complex play and self-talk, and offers supports through specialized teacher behavior and such prompts as visual cues in the classroom setting. |

Three early intervention programs have been selected to be discussed here that appear promising for children affected by prenatal alcohol exposure. Each has been designed to provide developmental stimulation and environmental enrichment to combat social disadvantage and remediate developmental deficits. Each has a special focus on promoting

child self-regulation. These are comprehensive and multi-modal interventions, and therefore may have larger positive effects on child development. But they may also cost more than interventions with fewer components. The first program was designed specifically for children known to be prenatally exposed to alcohol. The second was designed for children in foster care, who are at high psychosocial risk and where many are likely to be prenatally alcohol-exposed. The third was designed specifically as a preschool curriculum to promote child self-regulation, an important deficit among children affected by prenatal alcohol exposure. Table 9 briefly describes these programs.

Math Interactive Learning Experience Program

One research group that has systematically begun to test methods for intervention with children affected by prenatal alcohol exposure, including early intervention, carried out the Math Interactive Learning Experience Program (MILE) Program [5 (see Study #2)]. This multimodal intervention program served children with prenatal alcohol exposure, or FASD, aged 3 to 10 years, and their families. The program specifically focused on improving behavior and math functioning through parent training in workshops, individualized educational intervention that involved active learning, and multifaceted efforts to improve learning readiness and behavioral regulation in children. Gains were seen in decreased behavior problems and improved early math achievement after intervention [11], and these improvements were sustained over a 6-month follow-up and generalized to improved behavior in the school setting [110]. Direct skills-based intervention with the children was successful with families whose needs were met through additional parent education and family support services.

Multidimensional Treatment for Preschool Children in Foster Care

The Early Intervention Foster Care (EIFC) project (also known as Multidimensional Treatment Foster Care-Preschool) is a preventive intervention program, developed by Fisher and his colleagues. This program targets commonly co-occurring variables among preschoolers in foster care. These include behavior problems, physiological dysregulation within the neuroendocrine system (*i.e.*, HPA Axis activity), and developmental delays. This early intervention model is based primarily on animal research uncovering the negative effects of early stress on development. Theory behind the EIFC intervention emphasizes the importance of the care giver as an extension of the infant's regulatory system. The idea is that the care giver's actions protect the young child from the potential negative effects of outside stresses, promoting resilience. Without good quality care giving, the thought is that alterations in HPA Axis activity are likely to happen for the young child. The EIFC intervention is designed to support responsive and competent care giving for young children in foster care, trying to remediate the effects of early adversity.

In research on the EIFC intervention, outcomes studied have included placement stability, parent-child attachment quality, child behavioral regulation, and neuroendocrine and executive functioning. The EIFC intervention is delivered through a treatment team approach, and uses a developmental framework in which the issues of children in foster care are viewed as due to delayed maturation. Multiple layers of intervention are designed to create optimal environmental conditions to promote developmental progress. Foster parents receive pre-service training and ongoing consultation from program staff. Children have access to individual therapy and a therapeutic playgroup. The intervention emphasizes concrete encouragement for pro-social behavior, consistent and non-abusive limit-setting to deal with disruptive behavior, and careful, close supervision of the child. The aims are for foster parents to create a predictable daily routine, and to be responsive and consistent care givers.

In a randomized control trial, the EIFC intervention was compared to a regular foster care condition. Among other findings, after EIFC intervention, attachment behaviors were found to improve, with increased secure behaviors and decreased avoidant behaviors relative to the regular foster care condition [111]. For children with many foster placements (4 or more), a doubling in the rate of successful permanency attempts was found in the EIFC intervention group [112]. Findings from the EIFC intervention, and research on another attachment-based infant mental health intervention [76], show that care giver-focused interventions can help normalize HPA Axis activity. These physiological changes of improved stress reactivity co-occur with important positive changes in child behavior [113].

In research on the EIFC intervention, outcomes in the preschool years are expected to predict longer-term outcomes in early elementary school, including school behavior, long-term placement stability, and mental health status.

Childrearing practices of parents are expected to impact both the children's short-term and longer-term outcomes. Even though somewhat expensive in the short-term, the aim is that the EIFC intervention will be cost-effective long-term by reducing the length of time children spend in foster care, and reducing the need for later costly social, mental health and educational services.

Tools of the Mind Curriculum

The Tools of the Mind curriculum [114] was developed based on the principles of the Russian developmental theorist, Vygotsky, who suggested that children's cognitive development is built through play and learning-oriented social dialogue with adults [115]. The Tools of the Mind curriculum is designed to promote self-regulation skills for preschoolers by focusing on: (1) promoting child ability to regulate behavior and thoughts, attention, working memory, symbolic representation, and (2) increasing pre-academic skills, such as literacy and math abilities [116]. The curriculum is specifically designed to incorporate learning of self-regulation skills into pre-academic activities by promoting complex play and self-talk or private speech, and offers supports such as visual cues in the classroom setting. Teachers help children plan play themes and roles, remind children of rules, and help them make unique use of materials in imaginative play. When children learn to integrate others' plans and make a plan for themselves, they are practicing higher-order cognitive skills.

Vygotsky's theoretical framework suggests that children develop early self-regulation skills by practicing regulating the activity of others. They practice this by interacting with and directing their peers. Based on this concept, the Tools of the Mind curriculum also incorporates student-to-student activities such as turn-taking or checking the partner's work. Imaginative play also involves pre-play planning, development of imaginary roles, and explicit and implicit rules. Teachers and peers remind children if they do not follow these rules in order to promote self-monitoring of behavior during play. There is also an emphasis on using minimal props or using abstract play materials (such as a box with numbers drawn on it rather than a play cash register). This is done to increase creative and flexible thinking skills. Children also learn motor regulation by activities during games that require them to pose their body on command [117,118].

A multi-site test of efficacy of the Tools of the Mind curriculum was completed by Diamond and colleagues [119,120] with 147 preschoolers in low-income, urban preschools. This study compared the Tools of the Mind curriculum to a literacy curriculum that did not include material and activities focused on improvement of higher-order cognitive skills (executive functioning). Children who received the Tools of the Mind curriculum outperformed the literacy group on measures evaluating the following cognitive skills: inhibition; working memory; and attention switching. This study demonstrated that core components of 'executive functioning' can improve in a classroom setting for young children.

Because children with FASD have documented deficits in higher-order cognitive skills (executive functioning) and need to improve these if possible, Tools of the Mind may be a promising curriculum. The Tools of the Mind curriculum is woven into the natural environment of the preschool classroom, involves considerable teacher assistance, builds on social motivation, and uses sensory, motor and play activities for learning. These aspects of treatment delivery may make it especially applicable to children affected by prenatal alcohol exposure, or with FASD. However, with the attentional deficits, high activity level, and difficulties in social cognition and communication of this child population, the Tools of the Mind curriculum may not work as expected. Therefore, adaptations will probably be necessary, such as a higher teacher-child ratio with increased levels of adult support and structure for play activities, and perhaps less reliance on abstract play materials.

REALMS OF TREATMENT FOR YOUNG CHILDREN AFFECTED BY PRENATAL ALCOHOL EXPOSURE TO BE FURTHER EXPLORED

This chapter ends with a discussion of a variety of other promising treatment directions for young children affected by prenatal alcohol exposure that are in need of research investigation. Some are established interventions that should be enhanced to better target this child population. There are several new treatment directions for young children in this population based on intriguing animal research. Examining animal research for ideas, Hannigan *et al.* [121] found improved outcomes among alcohol-exposed animals using strategies such as: (1) neonatal handling;

(2) unstructured environmental enrichment that may increase social interaction and activity; and (3) rehabilitative (or ‘therapeutic’) motor training focused on specific behavioral targets with set learning criteria (not just simple exercise). In animals, these strategies can improve behavioral performance and reduce (or even eliminate) deficits in alcohol-exposed rats and mice. However, even though some animal studies report neuroanatomical changes associated with improvements in behavior, there still seems to be persistent impairment in the plasticity of neurons. Hannigan *et al.* suggest the exciting possibility that neonatal handling may alter changes in HPA Axis activity and, therefore, early response to stress. Mechanisms of change for most of these strategies are not yet determined, but it is important to reach an understanding of these mechanisms over time in order to build good treatments.

Table 10 briefly presents new realms for early intervention. These target areas of deficit commonly seen among young children affected by prenatal alcohol exposure, or with FASD.

Table 10: New Realms for Early Intervention

| Intervention Categories |
|--|
| <ul style="list-style-type: none"> • <i>Developmental Therapies, including Motor Training</i> • <i>Infant Massage, and Recreational Therapy/Exercise</i> • <i>Sensory Integration-Based Treatments</i> • <i>Occupational Therapy Consultation Model</i> • <i>Alternative Approaches</i> • <i>Monitoring for Emerging Problems in Language and Communication</i> • <i>Treatment for Sleep Problems</i> • <i>Other Treatment Realms: Nutritional Supplementation; Psychopharmacology</i> |

Developmental Therapies, Including Motor Training

The large FAS DPN diagnostic clinic database discussed earlier shows that developmental therapies are often recommended for young children affected by prenatal alcohol exposure [62]. Occupational therapists (OTs), physical therapists (PTs) and speech-language pathologists (SLPs) can carry out individual therapy from infancy onward, training oral-motor, language, motor and life skills. This might be seen as ‘rehabilitative training’ moving toward learning criteria that are set ahead of time. In addition, very few pioneering research projects are underway to examine the effects of specific forms of motor training among young children in this population.

Infant Massage and Recreational Therapy/Exercise

Infant massage, with parents delivering the massage, may be a brief treatment worth trying with infants born prenatally alcohol-exposed. This idea assumes these very young infants can be identified. This method may be supported by the animal research discussed earlier. Infant massage has been shown to be efficacious for children who are biologically vulnerable because they are born preterm. While increased weight gain has been the outcome of interest in studies of infant massage, studies also show that moderate pressure massage for newborns also leads to more organized behavior in the child. Newborns receiving moderate pressure massage appeared more relaxed and less aroused than a light pressure massage group [122]. In another study, stress behavior and movement were decreased among newborns receiving massage, who also gained more weight [123]. Interestingly, mothers doing massage with their babies also experienced a decrease in depression and anxiety symptoms [124].

A wide variety of community-based recreational exercise programs are available for infants and young children. These activities such as music, dance or movement education, can be viewed as approaches to early education, and some may be promising targets for research [125]. Recreational exercise provides general developmental stimulation, skills training, and chances for socializing with peers. Benefits of this as an intervention may be supported by the animal research discussed earlier. Parents of children with FASD anecdotally report benefits from enrolling their children in these programs. Clinical wisdom suggests that recreational programs more likely to be

successful with young children in this population are those that are individualized to child needs, rely less on verbal instruction, focus on individual rather than group performance, and emphasize effort over competition. Community programs include music programs, creative dance, tumbling and gymnastics programs, early sports (e.g., T-ball, swimming, martial arts). The Special Olympics Program (www.specialolympics.org) is especially likely to be successful with this child population. This organization offers a Young Athletes program in 21 countries for children with intellectual disabilities, aged 2 to 7 years [126].

Sensory Integration-Based Treatments

The ALERT Program for self-regulation was developed by Williams and Shellenberger [127,128]. This program of self-monitoring teaches children to monitor their physical and emotional level of upset feelings, such as frustration, anger, or sadness. Children learn to monitor their bodies and level of physiological arousal. They then learn strategies to help themselves tolerate distress and anticipate how to tolerate distress or focus attention when needed. This program was developed for children as young as preschool age [129] and has been adapted for children with FASD [130]. There are limited efficacy data on the ALERT Program or its use with children affected by prenatal alcohol exposure.

Principles from sensory integration-based programs such as the ALERT Program, and from literature on cognitive rehabilitation for pediatric traumatic brain injury, were incorporated into a group treatment used with foster or adopted children aged 6 to 11.9 years. Developed by Chasnoff and his colleagues, this is discussed in a paper on several FASD interventions with some efficacy data provided [5 (see Study #3)]. Briefly, their group included 12 weeks of intervention in small groups (approximately 5 children). Children were taught self-regulation skills using components of the ALERT program as well as additional skills targeting higher-order cognitive skills ('executive functioning' skills such as cause and effect, memory, sequencing, planning, and problem-solving).

Occupational Therapy Consultation Model

Jirikowic [131] described an occupational therapy (OT) consultation model focusing on sensory sensitivities and sensory integration issues of children with FASD. This short-term OT consultation model was used for intervention with families raising children with FASD, and may be especially useful for younger children, between the ages of 3 and 8. This model was first developed and used as part of a comprehensive positive parenting intervention known as the Families Moving Forward (FMF) Program (see [5] and earlier discussion in this chapter). It is possible that this OT consultation model could be used as a stand-alone treatment in mental health clinics and in schools.

In this model, an OT participates in developing parent education materials. The OT then trains behavior specialists working directly with families, and briefly consults with specialists on the issues of individual children, but does not have direct family contact. Parent education materials and clinician training focus on sensory-processing deficits and sensory-integration needs of children with FASD (especially those who are young), and how these may lead to behavior problems. Educational materials and consultation also cover sensory-based accommodations that can support positive child behavior. When consulting about individual children, the OT reviews clinical assessment data, and then assists behavior specialists in developing potential environmental or sensory accommodations that can help reduce problem behaviors. Examples include the use of sensory tools such as chair seats filled with water for a child who needs strong sensory input to reduce activity, calming methods such as "cool-off spots" in the classroom, or strategies such as reducing classroom noise. Through short-term OT consultation, behavioral specialists are 'cross-trained' and gain a working knowledge of possible antecedents for problem behaviors that could be sensory-based, and are also trained to collect sensory processing data.

Alternative Approaches

For young children, alternative treatment approaches to calming and self-regulation are of interest. For children of preschool age and older, alternative treatment approaches worth studying include applying the principles of "mindfulness" [132], and skills teaching of techniques for differential relaxation and yoga. Yoga might even be considered a type of motor training. Parents of children (including those with FASD or other special needs) anecdotally report trying these techniques with their children. (Interestingly, there are also approaches to 'mindful parenting,' such as the approach of *Listening Mothers* (www.listeningmothers.org) [133]).

These alternative approaches have not yet been studied systematically as treatments for children through well-designed research. For instance, the benefits of yoga for young children have not been fully clarified, although benefits are presumed to include more access to strategies for calming and improved overall child health [134]. To date, fewer than 20 randomized control trials on the use of yoga for children have been completed. In addition, research design for these studies has been criticized [135].

Monitoring for Emerging Problems in Language and Communication

Young children with FASD have been described as very “chatty,” so language problems may not be evident in everyday life. Care givers may actually misconstrue young children’s talkativeness as a strength and a sign of intellectual skill [136]. In the school years, however, Coggins *et al.* [137] found that 38% of 393 school-aged children in a clinic database showed severe impairments (>2SD below the mean) in at least one language domain. This percentage rose to 64% when assessments of complex discourse (e.g., narratives) were included.

Language delays have not been detected in recent careful longitudinal studies of the effects of prenatal alcohol exposure among two-year-old children [138]. In young children with heavy prenatal alcohol exposure, aged 3 to 5 years, in comparison to non-exposed controls, McGee *et al.* [139] found that receptive and expressive language abilities were impaired, but to no greater extent than was general intellectual functioning (Of course, many IQ tests are dependent on verbal abilities, so it is hard to separate these domains). McGee and her colleagues did conclude that existing language deficits would affect the behavioral function and social interactions of these young children. Certainly, when young children have problems in functional communication, and so have a hard time letting others know their wants and needs, they may then show challenging behavior. It also seems likely that young children’s language deficits would affect success in socializing with peers because young children cannot do much to adjust to another child’s language deficits.

As they grow older, language and communication deficits that emerge among children affected by prenatal alcohol exposure, or with FASD, may take the form of difficulties in the higher-level ‘integrative’ language abilities of middle childhood [140,141]. Higher-level language problems can be measured, such as difficulties in using language socially, or in constructing narratives (which are important at school and in social communication with peers) [142]. Research is very much needed to uncover how to measure the precursors of these problems when children are young.

In the early years, speech-language therapy is clearly important to help with functional communication. But for all children affected by prenatal alcohol exposure, the most important intervention may be developmental monitoring of the child and anticipatory guidance for their parents and teachers. Care givers need to understand that early talkativeness, and mastery of vocabulary and basic grammar, may not be the best predictor of later linguistic skills. Parents and teachers especially need to know about the likelihood of subtle, yet compromising language and social communication deficits that may occur as children grow older.

Treatments for Sleep Problems

Recent research has highlighted a remarkably high rate of clinically significant sleep disturbances among children with FASD as young as age 4 years [143,144]. These sleep disturbances are seen both in care giver report and overnight sleep studies, and likely lead to fragmented sleep. Converging animal and human evidence strongly suggest an association between prenatal alcohol exposure and disrupted sleep that starts as early as infancy, and persists into adulthood [26, 145-148]. There are physiological reasons to believe that the teratogenic effects of alcohol may lead to sleep disturbance of various types. Studies of infant sleep are especially important to sort out what problems exist that can be linked more directly to the teratogenic effects of prenatal alcohol exposure.

Systematic clinical studies have not yet been carried out to understand the nature of sleep disturbances in children with FASD, how early they start, or their relationship to daytime function. It is interesting to realize that the neuropsychological and behavioral difficulties of children with FASD are quite similar to those seen among children with markedly disrupted sleep. Once sleep problems are better understood, diagnostic techniques, pharmacologic guidelines and targeted treatments can be developed.

Sleep treatments already used by parents and providers, including medication use, must be understood through research. There are scientifically-validated behavioral sleep treatments available to be tested for infants and children with FASD. Useful treatments focus on environmental accommodations. These include promoting good sleep hygiene (such as a consistent, soothing bedtime routine and predictable bedtime), and providing self-soothing methods for the child who has frequent night wakings. Accommodations for sensory issues (such as using a weighted blanket) may be useful to help reduce the length and frequency of sleep problems. Treatment of disturbances in ‘circadian rhythm’ (the day-night cycle) may require detailed rearranging of family activities and the child’s sleep schedule, and perhaps treatments such as melatonin. For persistent sleep problems, including sleep movement disorders such as periodic limb movements, evaluation and treatment by a sleep medicine specialist is important.

Other Treatment Realms that Should be Explored

There are other early intervention methods now being explored or in need of further research. Some are so early in the process of development that most research has so far been reported only with animal models. Nutritional supplementation is one such approach. Innovative researchers have proposed the use of choline, a nutritional supplement, as a method for increasing learning and memory [149]. Documented improvement has been shown in animal models [149-151] through increasing cholinergic neurotransmission and cell function (such as repair and connectivity). Caution should be exercised in applying these findings, as details regarding dose and timing are still under scrutiny. Human studies are a next step.

Psychopharmacology for young children is mostly ‘off-label,’ because there is a limited database for medication use in the early years. There are many developmental considerations. Among these are the unknown impact of psychoactive medications on a young child’s developing brain and body. Safety and efficacy data on psychoactive medication use for children with FASD is almost completely lacking [3]. Diagnosis and assessment is often challenging for very young children, making it hard to guide medication choice. Yet many individuals with FASD receive diagnoses of other psychiatric conditions [39], including younger children with FASD and behavior problems [89]. Psychoactive medications are often prescribed. Frankel and colleagues [152] report varied medications being used for school-aged children with FASD, including neuroleptics, antidepressants, mood stabilizers, adjunctive treatments for sleep, and others. Limited studies do exist on the use of stimulant medication for children with FASD and co-morbid ADHD/ADD symptoms. But the overlap of ADHD and FASD is problematic. In general, children with FASD are more sensitive to medication dosing and may experience paradoxical reactions [153]. Further, there are complex factors involved in the use of psychopharmacology in preschoolers. As Gleason [154] notes, for nearly all disorders, psychosocial interventions have a stronger evidence based than pharmacological treatment and may offer sustained effects not seen with psychopharmacology. There is no single answer for every family. If medications are used, collaborative, multidisciplinary care models are important, along with frequent peer and specialty consultation for prescribing physicians.

SUPPORTIVE MATERIALS

1. Appendix 1: The importance of parent support for families raising children affected by prenatal alcohol exposure.
2. Appendix 2: Preliminary results suggesting that behavior regulation deficits may be an area of central difficulty for children with prenatal alcohol exposure.
3. Appendix 3 (Single Powerpoint Slide): Suggested training topics for early intervention providers working with children affected by parental substance abuse.
4. Appendix 4 (Two Powerpoint Slides): Selected additional evidence based parenting interventions for young children birth to age eight.

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APPENDIX I

Parent Support

Research in the general field of developmental disabilities repeatedly shows that the nature and quality of social support that is available to families is vital to positive family adaptation [1]. Social support comes from many sources, but a number of studies show that strong ‘informal’ (parent-to-parent) support systems are more likely to lead to positive outcomes. In the field of FASD, families with young children affected by prenatal exposure to alcohol often seek parent support and use methods of self-help. Experts agree this is a good idea. In fact, analysis of recommendations from the FAS DPN clinical database show that family resources, such as parent support, are often suggested for families with young children.

Support of good quality is always important. But population characteristics are likely to determine what the most appropriate type of parent support is. For example, for families raising children with FASD, support needs undoubtedly vary by type of family placement (non-relative adoptive, non-relative foster, kinship, birth parent) [2]. The importance of different types of support for different types of family placement can be seen in the spontaneous evolution of parent support mechanisms in the field of FASD. For example, special, separate ‘birth mother support networks’ and peer mentoring programs have been created which can deal with the unique stresses and concerns of birth parents [3]. Summarized testimony from birth parents indicates their special concerns that; for them, childrearing is associated with feelings of guilt and shame, financial strain, frustration with the lack of knowledgeable professionals, stress related to the child’s involvement in the judicial system, and multiple time demands [4]. The concerns of foster and adoptive parents are somewhat different (e.g. Brown *et al.*) [5].

In recent years, and especially with the advent of web-based communication, ‘informal’ parent support has grown in many ways to become more sustainable and organized. There are statewide networks of general parent-to-parent support, fathers’ networks, and parent support models such as the Program for Early Parenting Support (**PEPS**; <http://www.pepsgroup.org/>) [6]. There are also parent-to-parent support programs specialized for different disabilities. With an internet presence in the form of websites, and *via* list serves, email, and other types of web-based communication, parent support groups provide a rapid and flexible means of dialogue and support from other parents. These groups also provide access to parent-led community education and self-help. Beyond web-based connections, parent support networks can also be the platform for other parent-led services.

Parent support has grown quickly in the field of FASD, suggesting families find it useful. Support groups began to appear in the 1980’s with growing momentum by the early 1990’s and this momentum has been sustained to the present day. There is now a lively national FASD parent support organization in the U.S. (with multiple affiliates at the state level) called NOFAS (www.nofas.org) [7]. Other countries, such as United Kingdom (www.nofas-uk.org) [8], Canada (<http://www.faslink.org/faslink.htm>) [9], and others, also have very active FASD parent support organizations. These organizations have grown and matured, especially in countries with national leadership efforts, and are beginning to link internationally.

There are also many community-level FASD parent support groups (for listings by state and country see: <http://depts.washington.edu/fadu/Support.Groups.OI.html>) [10]. These groups may simply be a platform for peer support between parents. But they may also sponsor a diversity of services, such as summer camps, social skills groups, teen groups, respite care, parent education efforts, and personal advocacy. Some of these groups even act as publication outlets, carry out public policy activities, or provide platforms for FASD diagnostic services.

Parent support and self-help mechanisms in the field of FASD appear not to have been formally evaluated in the scientific literature. Because of the importance of parent support to child and family outcome, evaluation research is very much needed. Both internet-based support mechanisms, and more traditional means of parent support and self-help, should be investigated.

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APPENDIX II

A Central Difficulty: Behavioral Regulation Problems Among Young Children Affected by Prenatal Alcohol Exposure

In the usual course of development from infancy into toddlerhood and the preschool years, children achieve self-awareness and learn to regulate their behavior. For children affected by prenatal alcohol exposure, the usual developmental process may not go well. Problems in behavior regulation, which can negatively affect their early social relationships, seem to be common among these young children. Therefore, interventions to improve behavioral regulation should be a central focus for young children affected by prenatal alcohol exposure.

Behavior regulation is one aspect of a broader construct known as self-regulation. The term “self-regulation,” rather than behavioral regulation, is often used by developmentalists when talking about children who have reached the preschool years and beyond.

Self-regulation is a complex construct with many related abilities involving the regulation of behavior, emotion and cognition including a group of cognitive abilities collectively termed executive functions. Self-regulation skills develop rapidly during the preschool and early elementary years [1]. At the same time, the emergence of executive functions is associated with the ongoing development of part of the brain called the prefrontal cortex, which matures quickly during early childhood with ongoing maturation through adolescence [2-3]. Children’s early executive function skills predict later social competence [4-5]. The early years of life are an important period of brain development, and there is potential during this time for intervention to improve deficits in self-regulation skills.

One important aspect of self-regulation is ‘inhibitory control,’ or children’s ability to inhibit their internal and external reactions to environmental stimuli. Inhibitory control involves the inhibition of a well-learned or automatic response, or what are called ‘pre-potent’ responses in the face of temptation [6]. In children who are typically developing, inhibitory control develops during the preschool years, especially between ages 3 and 5 [7]. Inhibitory control predicts later academic and social competence, and even what has been called development of the “conscience” during childhood [8-9]. Children with disabilities, such as those with ADHD, typically show problems in inhibitory control when they are older [10-11]. Parent ratings of young children diagnosed with an FASD suggest these children have significant problems in behaviors reflecting executive functioning. Specifically, Rasmussen and colleagues found all scales on the Behavior Rating Inventory of Executive Function (BRIEF) were clinically elevated, indicating problems, but that for young children (5 to 8 years) the ‘Inhibit’ scale showed the highest elevation [12]. If direct testing data confirms the existence of these deficits in young children, interventions to remediate problems in inhibitory control (or teach care givers how to accommodate these difficulties) may help improve children’s adaptive function.

Inhibitory control among children with FASD has primarily been examined using parent report, and data on young children are scarce. The authors and their colleagues, Wilson and Picciano, recently completed a pilot study involving observations of the inhibitory control of children with FASD and the findings are currently in preparation. The researchers plan to report the results of this study more fully in a subsequent publication, along with data on the related construct of attention regulation. But because findings are of interest when thinking about interventions for young children with FASD, preliminary results are included here.

A group of young children with FASD were compared to a group of high-risk, typically-developing peers on measures of inhibitory control. Using a high-risk comparison group was considered important because the children diagnosed with FASD also typically experienced high levels of cumulative psychosocial risk, which itself can impact inhibitory control [13]. The research hypothesis was that the group of children with FASD would perform more poorly on measures of inhibitory control than comparison peers.

A sample of 13 children with a clear diagnosis of FASD, with chronological age ranging from 5.2 to 8.3 years old, was matched to a group of 13 high-risk, typically-developing peers. Matching was based on mental age calculated from direct testing of verbal reasoning skills. Inhibitory control was assessed with two tasks carried out in the laboratory that are often used with young children. Task performance was coded live during the task, or afterwards

from videotapes, by trained examiners who achieved acceptable inter-rater reliability. The battery included: (1) the well-known Simon Says task [8], which resembles the childhood game of the same name; and (2) the Delay of Gratification task [14], in which children must wait alone in a room for seven minutes before eating a snack, with the snack sitting on the table before them. Children's comprehension of task instructions was checked before the actual inhibition tasks were given. This presumably minimized demands on working memory, a consistent problem for children with FASD [15] and raised the likelihood that inhibitory control (and not simply task understanding or recall of instructions) was evaluated, which has been a problem in earlier direct testing of inhibitory control in preschoolers [16].

Preliminary findings revealed significant group differences on the Simon Says task, a measure of suppression of movement in the face of changing instructions that is especially sensitive to deficits across the developmental age period of ages 4 to 6 [7], and likely through age 10 years [17]. Children with FASD had significantly more difficulty inhibiting their behavior during this task. Group differences were quite clear, even in this relatively small sample. Differences in motor skill were not seen as the sole reason for group differences, because both groups of children could adequately perform the movements in the Simon Says task. In contrast, the two groups of children did not perform differently on the Delay of Gratification task, a measure of suppression of an impulse to eat a preferred treat. The Simon Says task was considered more complex because it required the child to repeatedly inhibit responses and follow a generalized rule across different situations and in changing form. For example, some trials required inhibition of touching their nose and other trials involved making large movements like clapping or waving hands. The Delay of Gratification task only required the child to adhere to a simple rule (resist the temptation to eat). Results so far suggest that some aspects of inhibitory control may be affected in children with an FASD, especially when children are required to exercise inhibitory control in the face of more complexity. For these young children with FASD, initial findings suggest that deficits in inhibitory control are explained by disability status rather than intellectual level or psychosocial risk. If these findings hold true in future replication studies, interventions to improve deficits in inhibitory control and, more broadly, in behavioral and self-regulation, are indicated for young children with FASD.

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APPENDIX III

| Suggested training topics for early intervention providers working with children by parental substance abused (Adapted from Olson <i>et al.</i> , 2007, p. 184) |
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| How to ask questions about prenatal exposure. |
| The process of addiction and recovery; harm reduction and relapse prevention. |
| How to provide FASD prevention information. |
| How to recognize and screen for the characteristic facial features of FAS, small head size, and mild or greater growth impairment. |
| Key behavioral symptoms signaling need for diagnostic referral when in the presence of alcohol exposure. |
| Advocacy skills to help children at risk continue to be monitored or qualify for services even with subtle deficits, and to promote services in the next intervention setting. |
| Neurodevelopmental disabilities, and specifics about FASD; how brain development and function are affected by prenatal alcohol exposure. |
| How to provide appropriate early intervention given current data on FASD, with a focus on environmental modification and antecedent-based positive behavior support planning. |
| The family experience of raising children with FASD, and differences between different family structures. |
| How parental substance abuse affects children's lives. |
| CAPTA and IDEA regulations, and interagency efforts to improve services for children affected by parental substance abuse. |
| Systems of care for chemical dependency treatment, FASD diagnosis, child welfare, crisis placement, foster care, adoption, adult corrections, and adult developmental disabilities services. |

APPENDIX IV

| Key References | Key References |
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| <p><i>Incredible Years:</i> www.incredibleyears.com Webster-Stratton C. The Incredible Years: Parents, teachers and children training series. <i>Res Treatment Children Youth</i> 2001;18(3):31-46.</p> <p>Webster-Stratton C, Reid MJ, Hammond M. Treating children with early-onset conduct problems: Intervention outcomes for parent, child, and teacher training. <i>J Clin Child Adolesc Psychol</i> 2004;33:105-24.</p> | <p><i>Parent-Child Interaction Therapy (PCIT):</i> Eyberg SM, Nelson MM, Boggs SR. Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. <i>J Clin Child Adolesc Psychol</i> 2008;37(1):215-37.</p> <p>Eyberg SM. Parent-child interaction therapy: Integrity checklists and session materials. Unpublished manuscript, University of Florida at Gainesville 1999. [Updated 2010 February; accessed 2010 March 10]; http://pcit.php.ufl.edu/measures/indiv%20pcit%20manual%20feb%202010.pdf.</p> <p><i>Data on use with children with FASD:</i> Bertrand J. Interventions for children with fetal alcohol spectrum disorders (FASDs): Overview of findings for five innovative research projects. <i>Res Dev Disabil</i> 2009;30:986-1006.</p> |

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Parent-Child Home Program
(one example of a program focused on parenting and school readiness)

www.parent-child.org

Kamerman SB, Kahn AJ. Starting Right. New York: Oxford

Treatment for ADHD: Barkley Model

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Selected Additional Evidence Based on Parenting Interventions for Young Children Birth to Adulthood

Incredible Years - Parent Training

Parent Management Training

Helping the Noncompliant Child

Parent-Child Interaction Therapy (PCIT)

Parent-Child Home Program

(One example of a program focused on both parenting & school

Treatment for ADHD: Barkley Model