

Drug Endangered Children: Risk Factors & Neuropsychological and Psychosocial Development

Kiti Freier Randall, PhD

Pediatric Neurodevelopmental Psychologist, Consultant

San Bernardino County; Children's Network, First Five & SART Programs

LLU & Children's Hospital, Depts of Pediatrics & Public Health

National Alliance for Drug Endangered Children, Co-Chair NPAI Working group

The National Alliance for Drug Endangered Children fully endorses this white paper *"Drug Endangered Children: Risk Factors & Neuropsychological and Psychosocial Development"* authored by Kiti Freier Randall, PhD, which offers content to the Core DEC training program. This program's evidence-based paper was developed from the nation's top experts in the fields of pediatric neurodevelopment and psychological assessment research. The National DEC Working Group professionals listed below, from a variety of fields with many years of experience in the substance abuse and child maltreatment reviewed and endorses this paper.

Andrea Darr, Victims Witness Assistance Specialist, WV Prosecuting Attorneys Institute

Doug Burnham, Health Specialist, University of Kentucky College of Social Work

Jenae Tucker, Desert/Mountain Special Education Local Plan Area (SELPA)

Peggy Scheuermann, Deputy Division Director, FL Dept. of Health, Children's Medical Services

Rivka Greenberg, Independent Consultant

Ronald Powell, Administrator, Desert/Mountain Special Education Local Plan Area (SELPA)

Rosemary Tisch, Director, Prevention Partnership International

Steve Hornberger, Program Director, National Association of Children of Alcoholics (NACoA)

Tammy Dehesa, Founder, Making a Difference Association

Walter Lambert, Medical Director, University of Miami Child Protection Team

Dr. Kiti Freier Randall Biography

Dr. Kiti Freier Randall is a Pediatric Neurodevelopmental Psychologist with an extensive background working with high-risk infant and youth populations for over 20 years. As a consultant for Children's Network and First Five San Bernardino, Dr. Kiti works with the San Bernardino County SART centers, Desert Mountain SELPA and San Bernardino County Preschools in California. She holds an academic appointment in the Departments of Pediatrics and Public Health at Loma Linda University & Children's Hospital in California.

In addition, Dr. Kiti has served as a School Psychologist in Massachusetts, Rhode Island and currently in California. She has worked with high risk youth in a number of settings including juvenile corrections, community mental health and children's hospitals. Dr. Kiti has specialized expertise in the area of children ages zero to five and drug affected children.

Dr. Kiti obtained her PhD in Clinical Psychology at Rosalind Franklin University of Medicine & Science. She completed an internship and fellowship in High Risk Pediatrics at Henry Ford Hospital and Northwestern University. She has had a considerable academic career with professorship positions at the University of Miami, Brown University, Andrews University and Loma Linda University. Dr Kiti was awarded the Distinguished Service Award (2007) and the Centennial Vanguard Award for her service in 'Wholeness' (2006) from Loma Linda University. She has been an investigator on several NIH, Federal, State, and Private Foundation grants.

Dr. Kiti is co-chair of the NPAI working group and Advisory Board Member for the National Alliance for Drug Endangered Children. She is a member of the California State Alliance for DEC and San Bernardino County DEC Committee. She is an expert in both research and training related to youth high-risk behavior prevention and intervention nationwide and internationally. Through her work Dr. Kiti has emphasized and facilitated moving from understanding risk to promoting resiliency via numerous presentations and training in over 36 countries and throughout the United States.

Dr. Kiti has dedicated her career to providing direct service and training to children, families, professionals, organizations and communities to enhance the physical, cognitive, emotional, and spiritual lives of children and their families in order to promote optimal and healthy living.

The deleterious impact of prenatal and parental drug use on children is not new. However, Drug Endangered Children (DEC) was a term coined in relationship to the more recent concern of children growing up in 'methamphetamine lab' homes. Thus, manufacture of methamphetamine in the home has re-raised community awareness of the dire problem of children growing up these homes. However, both the National and many individual State Drug Endangered Children Alliances understand and maintain that a drug endangered child is any child who lives in a home where any drug is abused, manufactured or sold. As has been noted in the literature, children living in these environments are often subject to adverse childhood events such as physical, emotional, and psychological trauma (Barnard & McKeganey, 2004) making them at risk for long term sequelae and negative life trajectories.

Pre & Postnatal Environment

Historically, the focus of children with substance exposure had a more restricted focus predominately to the prenatal effects of substance exposure; Prenatal Drug Exposure (PDE). With an increase in substance use among women, typically in child bearing years, there has, in the past few decades, been a concern with the rising number of children born with prenatal substance exposure. As such many research studies have been conducted to better elucidate the effects of prenatal exposure. While by definition DEC, is typically centered on post-natal effects of drug exposure, a brief discussion of PDE is offered here as pre and post-natal substance exposure is often seen concurrently.

Prenatal Risks

The scientific literature and clinical reports reflect significant concerns related to in utero substance exposure. There is a substantial amount of literature reflecting the serious and deleterious effects of alcohol exposure and concerns of fetal alcohol spectrum disorders (Connor & Streissguth, 1996; Ryan, Bonnet & Gass, 2006). While there is perhaps less known about tobacco and prescription drug exposure, there are concerns related to developmental impact from these substances. As DEC has had a focus on illicit drug use, this article will focus predominately on illicit drug use.

Illicit drug abuse in the United States continues to be a prevailing public health concern. Even more distressing is the prevalence of drug use among pregnant women. Public health statistics suggest that prenatal substance exposure continues to represent a significant number of pregnancies. (Kelly, Zatzick & Anders, 2001; Perreira & Cortes, 2006) An example of this is noted in a study done in San Bernardino County California; one of the highest methamphetamine using regions in the nation. Pregnant women enrolled in prenatal care in selected sites in San Bernardino County were screened. As of December, 2005, 5,000 pregnant women had been screened. Overall, 41% of the women had a positive screen for substance use, including alcohol and tobacco (First 5 San Bernardino, 2006). Of noted concern, as voiced by Franck (1996) is that the "dramatic upsurge of drug use ...among women of childbearing age has given rise to concern bordering on panic about the effects of prenatal drug exposure on the development of their children."

Much concern surrounds the subsequent physical health of infants exposed to drugs in utero. A number of studies have cited the link between prenatal drug use and adverse physiological outcomes such as low birth-weight, premature delivery, placental abruption, decreased fetal growth, decreased birth-weight, reduced head circumference, cerebrovascular accidents, and sudden infant death syndrome (Allessandri, Sullivan, Imaizumi, & Lewis, 1993; Chasnoff, Griffith, Freier, & Murray, 1992; Hadeed & Siegel, 1989; Johnson, Nusbaum, Bejarano, & Rosen, 1999; & Slutsker, Smith, Grant, & Fleming, 1993, Hawley, Halle, Drasin, & Thomas, 1995; National Center on Addiction and Substance Abuse at Columbia University, 2003). Other postnatal findings include abnormal sleep-wake patterns, poor feeding, tremors, and hypertonia (Oro & Dixon, 1987).

The literature has discovered several long-term cognitive and behavioral risk factors for children perinatally exposed to drugs. In one study, substance exposed children were found to have smaller head circumference than the control group; a significant direct positive correlation between infant head size and scores of mental development was found (Chasnoff et al., 1992). In the same study, although it was found that the mean developmental scores of the three groups did not vary greatly, there was a greater proportion of drug exposed infants scoring significantly lower in the mental development index and psychomotor index of the Bayley Scales of Infant Development than the control group infants. Singer et al. (2002) found that prenatal cocaine exposure was related to significant cognitive deficits. This study reported that the cocaine-exposed children exhibited mental deficiency at age two at a rate five times higher than the general population. More commonly, specific deficits have been noted in areas such as language difficulties (Beeghly, Martin, Rose-Jacobs, Cabral, Heeren, Augustyn, Bellinger, & Frank, 2006), behavioral concerns (i.e. aggression, acting out behaviors) (Bendersky, Bennett, & Lewis, 2006) and higher rates of diagnoses such as Attention Deficit Hyperactivity Disorder and Oppositional Defiant Disorder (Linares, Singer, Kirchner, Short, Min, Hussey, & Minnes, 2006). The few studies assessing the effect of methamphetamine has focused on exposure in utero suggest that infants prenatally exposed do indeed suffer significant brain abnormalities in addition to significant cognitive deficits (Chang, Smith, LoPresti, Yonekura, Kuo, Walot, & Ernst, 2004; Smith, Chang, Yonekura, Grob, Osborn, & Ernst, 2001).

Another noted concern is the link between prenatal drug exposure and difficulty in school (Dixon & Behar, 1989; Zuckerman & Frank, 1992). As frequently experienced in my clinical practice, often times it is not until the child reaches school age, when he/she faces classroom demands, that apparent problems related to learning and behavior were identified or emerge (Metosky & Vondra, 1995). In infancy and during the toddler years, the homes of such families are often characterized as chaotic and lacking structure. Consequently, fewer demands are placed on the child such that a number of their learning and behavioral problems are not evidenced. Moreover, Dixon and Behar (1989) suggest that behavioral manifestations of drug-related central nervous system damage “may become evident only after the first year, when more complex visual-motor and social cognition tasks are required of the preschool and school-age child.” Accompanying

school performance concerns are concerns regarding the social-emotional development and projected occupational potential of exposed children. However, as many of the children are both pre and post-nataly exposed to a drug using environment it is difficult to determine exclusive contributions of pre vs. post natal environment to long-term outcomes of children. Along these same lines, in a study by Puslifer et. al. (2004) they conclude by stating that genetics (or PDE) interacts with the environment in the drug exposed children's school readiness. However, it is difficult to determine if difficulty in school is due to prenatal drug exposure, lack of a stimulating environment, and heritability, the authors speculate is a combination of the different variables.

Postnatal Environment

The National Committee for the Prevention of Child Abuse estimates that 10 million children (7-8%) in the United States alone are living with chemically dependent parents. (Kulig, The Committee on Substance Abuse, 2004). The National Center on Addiction and Substance Abuse (CASA, 2005) released alarming statistics stating that "parents who use illegal drugs, abuse alcohol, and use tobacco put 50% of the nation's children – more than 35 million of them – at increased risk of substance abuse and of physical and mental illness. This report estimates 13% of children under the age of 18 in the US live in a household where a parent or other adult uses illicit drugs. Studies reflect quite a range of estimates of the number of children in homes of risk due to substances. Factors such as whether alcohol is included as a substance and if another person in the home is using rather than the parent (sibling, grandparent) may be influencing the significant range in estimates. Regardless and importantly, drug endangered children; children growing up in a home where the family is struggling with substance abuse issues is a serious community-wide epidemic for our country.

The impact of parental drug abuse within the family setting is tremendous. Of particular importance and unfortunately most often neglected is the effect that drug abuse has on the children in these families. Children of drug addicted parents often live in homes where the drug, due to the effects of its addictive properties, becomes the primary, and sadly often the only, concern to the parents; hence the child's needs become at best secondary (Hawley, Halle, Drasin, & Thomas, 1995; McKeganey, Barnard & McIntosh, 2002). Children of drug addicted parents face several challenges both biological and environmental. As noted above the likelihood of prenatal drug exposure in combination with environmental risk factors including neglect, abuse, and exposure to toxic materials places the children at increased risk for neurodevelopmental and psycho-social difficulties (Barnard & McKeganey, 2004).

Trauma

Data regarding children of chemically dependent parents has been recorded for children of alcoholic parents more than for children of other substance abusers. However, as more data becomes available, the increasing concern for child in the addicted home, and notably, the single most potent risk factor for child abuse and neglect is the substance abusing parent (Johnson & Leff, 1999). Notably, 85% of states in the US report substance abuse as one of the major problems in homes with suspected maltreatment of children (Childwelfare.gov) Sixty percent of parents involved with child protective

services in San Diego County describe methamphetamine as their primary drug of choice (Hohman, Oliver, Wright, 2004). Risk factors for abuse in the DEC home include poor resources, diversion of resources from parenting to drug acquisition and use, criminal behavior, mental illness, poor parenting skills, and the direct influence of the drug on the behavior of the parent. Trauma changes the emotional landscape of the child distorting view of the world. These children subsequently are at risk for developmental delay and attachment disorders, or maladaptive behavior (Barnard & McKeganey 2004, Bays 1990). As stated by Perry (2002) "These destructive experiences [abuse and/or neglect] impact the developing child, increasing risk for emotional, behavioral, academic, social and physical problems throughout life".

Physical Abuse

Physical abuse, or non-accidental injury, as a risk factor for the DEC child is a frequent and distressing risk factor. The CASA paper (2005) documented that parents who abuse alcohol or illicit drugs are 3 times more likely to abuse their children and 4 times likelier to neglect them than parents who do not abuse these substances. In a study done in Canada parental substance abuse was associated with a more than twofold increase in the risk of exposure to both childhood physical and sexual abuse (Walsh et.al., 2003). In regards to parental substance use and child physical abuse clinical reports often reflect the direct effects of the substance as contributing to the physical abuse. Many accounts and the authors clinical experience indicate that often physical assault occurs due to caregiver aggression or irritability particularly when the state of arousal shifts and the 'high' from the substance is wearing off. During the bingeing or tweaking phases the users neurotransmitters are depleted and the pleasurable state of the drug is replaced with dysphoria or uncomfortable emptiness. As such there is no to limited resources available for parenting. During this time the user can also become paranoid and significant violence toward children can be the resultant consequence. In one of many examples, this was the case for two children whose mother used methamphetamine. In a state of methamphetamine induced paranoia the mother thought her 4 year old and 2 year old were telling the police of her drug use. She stabbed and killed the 2 year old and stabbed, attempting to kill the 4 year old, however, the 4 year old, with several stab wounds was able to get away to the neighbor's house and survive; albeit with long-term physical and emotional consequences.

Sexual Abuse

As noted in the studies cited above, sexual abuse is another type of abuse that is associated with substance abuse. In one study of randomly selected juvenile court records (n=109) of cases of child maltreatment, 67% of these cases involved parents who were substance abusers. Specific associations were found for cocaine abuse and sexual maltreatment of the child (Murphy et. al., 1991). The 'euphoria' or 'high' from the use of the substance is thought to be related to direct sexual abuse of the child. Law enforcement indicates an increase in the amount of sexual paraphernalia and pornography found in homes where methamphetamine is a primary drug of use. As such even if the child is not a direct victim of sexual abuse they are often exposed to pornography and sexual acts not appropriate for child observation. Clinically reports, primarily from foster parents, of children with behaviors that suggest the potential for sexual abuse (sexual

play, persistent masturbation, putting objects into genital orifices etc.) has increased and is often noted to co-occur in children who come from homes where methamphetamine is the drug of choice.

Emotional Abuse

Emotional abuse, or mental abuse, is often considered to cause damage that exceeds other forms of abuse. The passive or passive/aggressive inattention to the child's emotional needs, nurturing or emotional well-being can result in devastating and long-term effects. However, since there are no physical indicators it is challenging to identify. Further, children who have grown up in homes where daily chaos, rejection, intimidation and ridicule are 'typical' do not disclose the 'maltreatment' as they may see this as part of normal parenting. However, the indicators of emotional abuse are commonly seen in drug endangered children. As a result of their chaotic and hazardous home environments, they never know what to expect or on whom they can depend and as such, the drug endangered child often presents with an inability to age-appropriately handle their emotions and social interactions. Further, attachment disorders and other negative relational behaviors are a frequent concern in this population. Under the influence of substances the caregiver often has less internal resources necessary for positive parenting and as such caregiver frustration, daily chaos and negative interactions are often the etiology of the emotional abuse.

Neglect

Children with drug addicted parents are often not provided the basics of care; shelter, safety, food, proper hygiene, nurturance and medical attention when necessary. These children are often not fed, clothed, or cared for properly and very poor hygiene are extremely common. Further, as attachment is the primary work of the first few years of life and all aspects of development depend upon it, the lack of nurturing caregiving can have serious deleterious effects. Perhaps of most physical danger is when the parental preoccupation with addiction creates an environment in which the children are not monitored or supervised. Sometimes the parent will leave even young children alone in order to do their drug related business, other times they may be high and/or crashed etc.. These unsupervised children are left in an environment that is often filled with dangerous materials including drug paraphernalia or toxic materials often within the reach of children. Neglect is the primary 'cause' given for children who are removed from the homes of the substance using parent.

Loss

From birth drug endangered children can experience a series of losses; from the loss of security and trust to the loss of normal interactions with their family and community. Most importantly they have frequent changes in caregivers and caregiving environments. As such the drug endangered child has a significant history for grief and loss. Their losses may include abandonment, removal, incarceration or death of a parent, changes in caregivers (friends, kinship, foster), separation from siblings, changes in school, physical loss of function due to abuse and/or neglect, relocation, rape/incest, special needs, loss of home and/or possessions, loss of a pet etc. Many of the children will have multiple losses resulting in compounded grief. How vital then, that society, systems, professionals and

caregivers, perceive, respect and address the bereavement issues predictably occurring in all drug endangered children.

Synergy of Pre and Postnatal Risk

As noted above, children of drug addicted parents, typically face multiple challenges both biological and environmental. It is becoming more and more apparent that many drug endangered children are BOTH prenatally and postnatally drug exposed. Thus, it is the likelihood of prenatal drug exposure in combination with environmental risk factors including neglect, abuse, and exposure to toxic materials as noted above that places the child at even more increased risk for developmental, psychological and attachment disorders. It is unknown what the effects of this synergy are in relationship to a brain that is exposed to toxins in utero and then subsequently exposed to abuse and/or neglect during its postnatal development. Certainly we would expect that this compounded risk (biological and environmental) would result in significant risk factors where the sum is greater than the parts.

Ecology & Neurodevelopment

Commensurate with the discussion above is the need to highlight the interaction of ecology and neurodevelopment; in the case the broad reaching effects of drug environments on all aspects of the development of the child. The poor parenting of a caregiver under the influence of substances and the possibility of multiple caregiving placements put these children at significant risk for attachment difficulties (Freier, 1994). Thus, as the emotional development, attachment and bonding have been noted to significantly impact all aspects of development (Bowlby, 1969) this is an area of particular concern to the drug endangered child. Growing up in a DEC environment can affect all areas of development. The daily chaos, lack of safety, poor communication, violence, and disorganization typical in the drug environment will impact the child's; cognition, attention, learning, memory, language, physical development, motor skills, sensory integration etc. Further, children growing up in these environments do not have the fundamental developmental experiences required to self-regulate, relate, communicate and think. Importantly, failures in the development of self-regulatory capacities are believed to underlie a variety of behavioral problems, including attention deficits, oppositional behavior, tantrums, and some forms of social isolation." (Barton & Robins, 2000). This disruption of normal developmental experiences resulting in negative impact on all aspects of neurodevelopment is a focal point in trauma literature. (Perry, 2002) Thus the ramifications of pre and postnatal substance exposure can have long term effects on all areas of development. Further, even if/when the drug environment is ameliorated the drug endangered child may need intervention in order to reach their potential. This may be evidenced in the recent literature regarding the Adverse Childhood Events Study (Anda, Felitti, Bremner & Walker, et al., 2006) one of the largest scientific research studies addressing the relationship between multiple categories of childhood trauma with mental and physical health outcomes later in life. In a study conducted by the author and colleagues (Freier Randall, Powell & Tucker, 2009) 98% of children, in a clinical population, with confirmed prenatal Methamphetamine

exposure had a significant number of childhood events. This reveals a high risk for long-term negative trajectories for both psychological and physical health once again emphasizing the necessity for early intervention/treatment for drug endangered children is imperative.

Neurodevelopmental and Psychosocial Risks

Risk

A discussion of the neurodevelopmental and psychosocial outcomes for drug endangered children requires an understanding of the concept of 'Risk'. Risk as defined by the Encarta Dictionary of North America is the "chance of something going wrong; the danger that injury, damage or loss will occur". As such it can be assumed that ALL drug endangered children are "AT RISK" but at how much risk and risk for what remains somewhat unpredictable and even debated. However, patterns of developmental concerns for the drug endangered child have been noted from literature and clinical practice and are offered below.

The question of "at risk for what" is often not clearly elucidated or addressed. Cognitive, neuropsychological or psychosocial risk is not mutually exclusive as is sometimes alluded to in the drug endangered child literature. For example, if neurodevelopmental status is in the average range this says little about psychosocial functioning and perhaps vice versa. If a problem has difficulties that range from A-Z and a study addresses only D-K, this study can not be said to offer an explanation of the entire problem. As an example I will use a small pilot study done in my research lab. In this study caregivers of methamphetamine exposed children were recruited to participate in this IRB approved study during a routine medical visit. All participants underwent a medical and a neurodevelopmental evaluation (Bayley Scales of Infant Development, Second Edition). Fifteen children (9 males, 6 females) participated in this study. 47% of the children were born premature, however, no other birth variables were available. 93% of the children had age appropriate growth parameters, however, one child was SGA, blind in one eye and had hearing loss. Two children had craniofacial concerns. Results from the neurodevelopmental evaluation revealed mean mental and motor scores were within normal limits. Thus presuming that the prenatal and postnatal exposure to methamphetamine was not a factor in neurodevelopment. However, this pilot study did further investigation of functional status of these children and found that qualitative analysis of caregiver and professional (other professionals involved in the care of these children) concerns included; 67% speech delays, 47% emotional dysregulation, 27% feeding problems, 47% attachment difficulties, and 20% sleep disturbances. As such, while physical and developmental data revealed scores within normal limits, functional status concerns reflected significant neurodevelopmental and psychosocial difficulties. In fact, functional impairments were not detected by the most commonly utilized research measures suggesting the need to more broadly and to more appropriately address the needs of these children.

Further, as noted in this discussion, in addition to the 'how much' risk is the 'when' of risk. Too many times DEC studies which report child outcomes are misinterpreted to

suggest that these findings are predictive into the indefinite future when, in fact, child outcomes are very affected by development over time resulting in what might be called a 'sleeper effect'. A 'sleeper', in the negative sense, suggests belated difficulties or something that is not immediate but later can become a problem. For example, if a child is given a language evaluation at two years of age it is not predictive of language at 10 or even 5 years of age due to the nature of language development and how brain development and ecology interact. This is why it is key that drug endangered children need to be a part of a community, system or caregiving environment that monitors them to provide intervention and prevention as necessary.

Cognition or Intelligence

In general cognition or intelligence is not the primary risk factor for substance exposure EXCEPT in cases of alcohol exposure. Because of the nature of the blood brain barrier and limitations as to where toxins can 'travel' in the brain typically it is more specific regions that are targeted rather than global delays. As such, cognition or intellectual functioning in the drug endangered child is quite variable. It can range from at or above average to borderline and mental retardation. Due to the exposure to 'unhealthy' environments there can also be a significant amount of 'scatter' in the child's cognitive profile, making interpretation and intervention more challenging. Often, however, studies of high risk children including drug endangered children tend to report mean scores in the 'low average' range.

Neuropsychological Function

Language: As noted above in the discussion of prenatal exposure one area of significant neuropsychological concern for the drug endangered child is that of language deficits (Pulsifer et.al., 2008). This area is one of the most frequently seen areas of difficulty for DEC. While many drug endangered children have diagnosable and more global language disorders often these children are under or misdiagnosed. This is due to the fact that many of the children may have some vocabulary or simple rote conversational language but be missing out on the who/what/where/when/why of language or they are 'good' at hiding their deficits. Further, in clinical practice the author has frequently seen more receptive language deficits rather than expressive language delays. Typically the frustration of poor communication skills results in behavioral problems and frustration and possibly anger resulting in many of drug endangered children as being misdiagnosed with behavioral disorders and the language disorder goes undetected. In addition to the toxic physical and social environments, the frequent respiratory infections, allergies, and asthma seen in drug endangered children may also contribute to the language difficulties in these children.

Visual spatial/scanning/motor skills: Visual spatial and visual motor skills are not as frequently identified in the literature as a primary concern for the drug endangered child. However, clinically it has been noted that eye-hand coordination and visual overwhelm

(i.e. being easily overloaded by too much visual stimuli) can be of concern and should be assessed and monitored.

Sensorimotor/Sensory Processing Difficulties & Sensory Integration: Concerns related to sensory input and integration are reportedly common in the drug endangered child as in children with histories of trauma. Research suggests that sensory problems in young children may be related to maternal stress during pregnancy (Foster, 2006). However, a stressful postnatal environment may also cause challenging or aggressive behaviors in children. “They are locked in a persistent ‘fight or flight’ state. They often display hypervigilance, anxiety, panic, or increased heart rate.” (Perry, 2005). Arousal in the fight or flight state can lead to limited or insufficient sensory exploration and sensory processing resulting in difficulties in this area. A child with insufficient responses may get easily overwhelmed, appear to be hyperactive or sensory seeking, shut down, have low energy and fatigue. Often these children are also misdiagnosed as behavioral problems and the sensory disorder goes undiagnosed and not treated.

Attention: Drug endangered children are reported to have difficulty with attention and hyperactivity. The etiology of attention concerns in the drug endangered child are varied. Of note, in the toddler and early childhood years, poor self-regulation as noted in the sensory deficits is exhibited through mood swings, impulsivity, short attention span, high distractibility, and hyperactivity (Brooks, Zuckerman, Bamforth, Cole, & Kaplan-Sanoff, 1994) and as such it may not be attention per se but rather self-regulation which is the primary concern. In addition, the high risk environments in which the children are living predispose the child to a state of hyperarousal due to chaos and lack of consistency. Further, it is common for children with a history or trauma to be hypervigilant in order to continually monitor and scan their environments for safety, food or other basic needs. As such often it is NOT that the drug endangered child can not pay attention to anything but rather that the child must pay attention to everything. Certainly the function of attention is a complicated and diverse symptom.

Memory: Martin (2000) in her evaluation of the cognitive development of children exposed to cocaine and/or methamphetamine concluded that prenatal exposure to these drugs “may have deleterious, latent effects on the information processing systems that are crucial for learning and memory”. While there is a paucity of research available in terms of memory, Working Memory difficulties in the drug endangered child are frequently clinically identified. This is commensurate with the data from studies reporting memory deficits in adult methamphetamine users (Fals-Stewart, W., 1993; Simon et. al., 2002; Thompson et al, 2004) It is not typically memory of an event or situation that is affected but rather the ‘problem solving’ aspect of memory; using information already provided to solve a problem or adjusting information to come up with an answer.

Psychosocial

Emotional

Attachment: A key area of concern AND contributor to other symptoms (hypervigilance, anxiety, memory problems etc) is that of Attachment difficulties. The formation of

attachments is a primary phase of development for the infant/young child which affects all other areas of development and psychological functioning (Greenberg, 1999). Trauma, direct or indirect, can interfere with the development of attachment, trust and the development of sense of self, and may lead to mistrust, disordered attachment, and disturbed sense of self. As a result of this disordered attachment, future interpersonal relationships and social competence are likely to be affected. In addition, separation of the child from the caretaker, such as removal from the home in cases of abuse or neglect, can lead to disruption of attachments. Further, with abuse or neglect in the caregiving environment in conjunction with multiple changes in caregivers can result in a more disorganized attachment and result in negative social emotional consequences (Perry & Marcellus, 1997). Disorganized attachment is characterized by a fear of the caregiver which activates the attachment system. Thus the infant at once feels afraid of the caregiver and yet feels compelled to seek proximity. However, proximity seeking increases fear and anxiety and the infant “contradicts” the approach pulling back and seeking a new attachment figure and the cycle continues.

Post Traumatic Stress Disorder: The primary and often overlooked diagnosis of the drug endangered child is that of Post Traumatic Stress Disorder (PTSD). While, as noted above many drug endangered children are abused they may also witness violence – frequently alcohol and other drug abuse goes hand in hand with domestic violence. As such the drug endangered child may suffer from post-traumatic stress syndrome, with the same kinds of sleep disturbances, flashbacks, anxiety, and depression that are associated with victims of war crimes. Further, overwhelm from trauma particularly in absence of positive attachment can result in a very atypical or disconnected response to environment. As such during times of distress the child may not be responsive or demonstrate restricted response with behaviors of withdrawal, looking like they are ‘Off in space’ or ‘Not Connected’ (Perry, & Marcellus, 1997).

Anxiety: When the expectation of being hurt, disappointed, and afraid is carried forward to new relationships, the anxious infant becomes an angry, aggressive child. Drug endangered children who experience the trauma and or chaos of the drug home often present with mistrust and fears which can result in sleep disorders. The sleep disorders may take on a variety of problems including nightmares, restlessness, and/or insomnia. (Sadeh, 1996)

Depression: For some children the consequences of the chaos and/or abuse of the drug endangered environment include depression. This may be seen in withdrawal or acting out behaviors, aggression, self-mutilation, and suicidal ideation. The complexity of emotions love/anger, guilt/self-blame and shame can be overwhelming for the child result in angry, antisocial, physically aggressive and even violent behaviors. (Osofsky, 1997)

Behavioral

Interpersonal Problems: It is rare for a practicing alcoholic or addict to successfully negotiate the demands of healthy interpersonal relationships thus providing poor interpersonal role models to their children. Interpersonal problems for drug endangered children may include poor communication skills (environmental deprivation, language

delays etc.), aggression (sensory seeking, depressed, anxious etc.) or other oppositional behaviors. For self-nurturance the drug endangered child may have learned to engage in maladaptive behaviors such as stealing, lying and or other high risk acting out behaviors.

Cycle of Use/Abuse: Breaking the cycle of abuse is a primary goal of efforts to serve the drug endangered child. It is known that use of substances by parents and their adolescent children is strongly correlated (i.e. when parents use drugs their children eventually use drugs as well). Children of addicted parents are the highest risk group of children to become alcohol and drug abusers themselves. Further, children who have been abused are at high risk to become victims of abuse as an adult or become a perpetrator of violence. Society must grapple with the fact that many children, as young as 9-11 years old, will become substance abusers. When they begin to abuse or use will they be seen as a drug endangered child?

Resiliency and the Drug Endangered Child

Drug endangered children are a high risk population. There is a dire need to better understand the needs of the drug endangered child so that more appropriate and efficient intervention strategies may be implemented. The drug endangered child will require and deserves service provision that intervenes with specialized training and care. At minimum the professionals involved in their care must have an understanding and skill with issues related to neurodevelopment, attachment, post traumatic stress disorder, hypervigilance, effects of trauma and drug related effects.

As patterns of functional capacity begin from the first days of life it is never too early to intervene for the at risk child. However, we must also provide intervention whenever a child is determined to be at risk; as it is also never too late. Certainly research and clinical studies have demonstrated that the earlier the intervention the more efficient and efficacious the outcome, however, research and current clinical trends support the potential for change throughout life. Further, a diversity of research no longer supports what was once thought that with trauma damage done is damage for life. In fact now there is scientific evidence that even neuronal regeneration is possible given the right 'environment'. The 'Hard Wired to Connect' report (Institute for American Values, 2003) cites research which demonstrates that an improved social environment can change a heritable vulnerability into a positive behavioral asset. This emphasizes a reason for optimism! Interventions, should they provide an improved social environment, can take a vulnerability and change it to an asset because we now know that the brain/environment relationship is not statistic but ongoing. Certainly the drug endangered child is at HIGH RISK, however, caregivers and those of us who work with or on behalf of the drug endangered child can tilt their 'balance' from risk to resiliency and help to ameliorate their functional status and change their trajectories.

References

Alessandri, S., Sullivan, M., Imaizumi, S., & Lewis, M. (1993). Learning and emotional responsivity in cocaine-exposed infants. *Developmental Psychology*, 29, 989-997.

- Anda, R.F., Felitti, V.J., Bremner, J.D., Walker, J.D. et al. (2006) The enduring effects of abuse and related adverse experiences in childhood : A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience*, 256(3), 174-
- Barnard, M., & McKeganey, N. (2004). The Impact of parental problem drug use on children: What is the problem and what can be done to help? [Electronic version]. *Addiction*, 99, 552-559.
- Barton, M. & Robins, R. (2000). Regulatory disorders. In C. Zeanah (Ed.) *Handbook of Infant Mental Health*, 2nd Ed. NY: Guilford Press.
- Bayley, N. (1993). *Bayley Scales of Infant Development—Second Edition, Manual*. San Antonio: Psychological Corporation.
- Beeghly, M., Martin, B., Rose-Jacobs, R., Cabral, H., Heeren, T., Augustyn, M., Bellinger, D., Frank, D. (2006) Prenatal Cocaine Exposure and Children's Language Functioning at 6 and 9.5 Years: Moderating Effects of Child Age, Birthweight, and Gender. *Journal of Pediatric Psychology*, 31: 98-115.
- Bendersky, M., Bennett, D., & Lewis, M. (2006). Aggression at Age 5 as a Function of Prenatal Exposure to Cocaine, Gender, and Environmental Risk. *Journal of Pediatric Psychology*, 31: 71-84.
- Bowlby, J. (1969). *A Secure Base: Clinical Applications of Attachment Theory*. London: Routledge.
- Brooks, C.S., Zuckerman, B., Cole, J., & Kaplan-Sanoff, M. (1994). Clinical issues related to substance-involved mothers and their infants. *Infant Mental Health Journal*, 15, 202-217.
- Chang, L., Smith, L., LoPresti, C., Yonekura, L., Kuo, J., Walot, I., Ernst, T. (2004). Smaller subcortical volumes and cognitive deficits in children with prenatal methamphetamine exposure. *Psychiatry Research: Neuroimaging*, 132, 95-106.
- Chasnoff, I.J., Griffith, D.R., Freier, C., & Murray, J. (1992). Cocaine/polydrug use in pregnancy: Two-year follow-up. *Pediatrics*, 89, 284-289.
- Connor, Paul D, Streissguth, Ann P. (1996). Effects of prenatal alcohol exposure across the life span. *Alcohol Health and Research World*, 20(3), 170-175
- Dixon, S.D. (1994). Neurological consequences of prenatal stimulant drug exposure. *Infant Mental Health Journal*, 15, 134-147.
- Dixon, S. & Behar, R. (1989). Echoencephalographic findings in neonates associated

- with maternal cocaine and methamphetamine use: Incidence and clinical correlates. *Journal of Pediatrics*, 115, 770-778.
- First Five San Bernardino (2006). Current evidence-based and emerging screening, assessment, and treatment practices for the mental and neurodevelopmental health of at-risk children ages zero to five. *Best Practices Committee Report*, San Bernardino, California.
- Franck, E. (1996). Prenatally drug-exposed children in out-of-home care: Are we looking at the whole picture? *Child Welfare*, 75, 19-34.
- Fals-Stewart, W. (1993). Neurocognitive defects and their impact on substance abuse treatment. *Journal of Addictions and Offender Counseling*, 13, 46–57.
- Freier, M. C. (1994). In utero drug exposure and maternal-infant interaction: The complexities of the dyad and their environment. *Infant Mental Health Journal*, 15, 176-188.
- Freier Randall, K., Powell, R., & Tucker, J., (2009). Meth & ACE: Long-Term Trajectories For Drug Endangered Children. *2009 National Alliance for Drug Endangered Children Annual Conference*, Spokane, WA.
- Foster, S.M., (2006). A Literature Review: The Effects of Maternal Stress in Pregnancy on Sensory Integration in Children. *Journal of Prenatal & Perinatal Psychology & Health*, 21(1), 83-91.
- Greenberg, M. (1999). Attachment and psychopathology in childhood. In J. Cassidy & P. Shaver (Eds.), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 469-496). New York: Guilford Press.
- Hadeed, A., & Siegel, S. (1989). Maternal cocaine use during pregnancy: Effect on the newborn infant. *Pediatrics*, 84, 205-210.
- Hawley, T., Halle, T., Drasin, R., & Thomas, N. (1995). Children of addicted mothers: effects of the ‘crack epidemic’ on the caregiving environment and the developmental of preschoolers. *American Journal of Orthopsychiatry*, 65, 364-379.
- Hohman, M., Oliver, R., Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work*, 49, 3, 373-381.
- Institute for American Values (2003) Hardwired to Connect: The New Scientific Case of Authoritative Communities. *Institute for American Values*, New York, New York. ISBN #1-931764- 04-02

- Johnson, J., Leff, M. (1999) Children of Abusers: Overview of Research Findings
Pediatrics Vol. 103 No. 5 Supplement pp.1085-1099.
- Johnson, H., Nusbaum, B., Bejarano, A., & Rosen, T. (1999). An ecological approach to development in children with prenatal drug exposure. *American Journal of Orthopsychiatry*, 69, 448-456.
- Kelly, R.H., Zatzick, D.F., & Anders, T.F., (2001). The detection and treatment of psychiatric disorders and substance use among pregnant women cared for in obstetrics. *The American Journal of Psychiatry*. 158(2), 213-220.
- Kulig, J. and the AAP Committee on Substance Abuse (2005). Tobacco, Alcohol, and Other Drugs: The Role of the Pediatrician in Prevention, Identification, and Management of Substance Abuse. *Pediatrics*, March Vol.115 No.3, pp 816-821
- Linares, T., Singer, L., Kirchner, L., Short, E., Min, M., Hussey, P., Minnes, S. (2006). Mental Health Outcomes of Cocaine-Exposed Children at 6 Years of Age. *Journal of Pediatric Psychology*, 31: 85-97.
- Martin, N. (2000). Effects of prenatal drug exposure on cognitive development and erps in 5 to 7 year old children. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 60, 3773.
- McKeganey, N., Bernard, M., & McIntosh, J. (2002). Paying the price for their parent's addiction: Meeting the needs of the children of drug using parents. *Drugs: Education, Prevention, and Policy*, 9, 233-246.
- Metosky, P. & Vondra, J. (1995). Prenatal drug exposure and play and coping in toddlers: A comparison study. *Infant Behavior and Development*, 18, 15-25.
- Murphy J.M. et al. (1991) "Substance abuse and serious child mistreatment: prevalence, risk, and outcome in a court sample", *Child Abuse Neglect*, Vol. 15, No. 3, pp. 197-211.
- National Center on Addiction and Substance Abuse at Columbia University (2005). Family Matters: Substance abuse and the American family.
www.casacolumbia.org. Last accessed May 15, 2009.
- Oro, A.S., & Dixon, S.D. (1987). Perinatal cocaine and methamphetamine exposure: Maternal and neonatal correlates. *Journal of Pediatrics*, 111, 571-579.
- Perreira, K.M., & Cortes, K.E. (2006). Race/Ethnicity and Nativity Differences in Alcohol and Tobacco Use During Pregnancy. *American Journal of Public Health*, 96(9),1629-1637.

- Perry, B. (2002). *Stress, trauma, and post-traumatic stress disorders in children*. Houston, TX: Child Trauma Academy.
- Perry, B. (2005). Maltreatment and the developing child. *The Margaret McCain Lecture Series*. The Center for Children and Families in the Justice System: Canada.
- Perry, B. D., & Marcellus, J. (1997). The impact of abuse and neglect on the developing brain. *Colleagues for Children*, 7, 1-4.
- Pulsifer, M.B., Radonovich, K., Belcher, H.M., & Butz, A.M. (2004). Intelligence and school readiness in preschool children with prenatal drug exposure. *Child Neuropsychology*, 10, 89-101.
- Pulsifer, M.B., Butz, A.M., O'Reilly Foran, M., Belcher, H.M. (2008) Prenatal Drug Exposure: Effects on Cognitive Functioning at 5 Years of Age. *Clinical Pediatric*, 47(1), 58.
- Ryan, D.M., Bonnett, D.M., & Gass, C.B. (2006). Sobering Thoughts: Town Hall Meetings On Fetal Alcohol Spectrum Disorders. *American Journal of Public Health*. 96(12), 2098-2102
- Sadeh, A. (1996). Stress, trauma and sleep in children. *Child and Adolescent Psychiatric Clinics of North America*, 5, 685-700
- Simon, S.L., Domier, C.P., Sim, T., Richardson, K., Rawson, R.A., Ling, W. (2002). Cognitive performance of current methamphetamine and cocaine abusers. *Journal of Addiction Disorders*, 21, 75-89.
- Singer, L.T., Arendt, R., Minnes, S., Farkas, K., Salvator, A., Kirchner, H.L., et al. (2002). Cognitive and motor outcomes of cocaine-exposed infants. *Journal of American Medical Association*, 287, 1952-1960.
- Smith, L.M., Chang, L., Yonekura, M.L., Gilbride, K., Kuo, J., Poland, R.E., et al. (2001). Brain proton magnetic resonance spectroscopy and imaging in children exposed to cocaine in utero. *Pediatrics*, 107, 227-231.
- Thompson, P.M., Hayashi, K.M., Simon, S.L. Geaga, J.A., Hong, M.S., et. al. (2004). Structural abnormalities in the brains of human subjects who use methamphetamine. *Journal of Neuroscience*, 24, 6028-6036.
- Walsh, C., MacMillan, H.L., Jamieson, E. (2003). The relationship between parental substance abuse and child maltreatment: findings from the Ontario Health Supplement. *Child Abuse and Neglect*, Dec, 27(12): 1409-25
- Zuckerman, B., & Frank, D. (1992). "Crack kids": Not broken. *Pediatrics*, 89, 337-339.