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# The Impact of Methamphetamine on Children

*A Bibliography*

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## Introduction

Use of methamphetamine has increased rapidly throughout the United States. The ease of synthesis from inexpensive and readily obtainable chemicals has led to the rampant increase in abuse of this drug. Data from the National Clandestine Laboratory Seizure System, there were 1,660 children affected by or injured or killed at methamphetamine labs during calendar year 2005, down from more than 3,000 in the three previous years (U.S. White House Office of National Drug Control Policy, 2006). Children who live at or visit drug-production sites or are present during drug production face a variety of health and safety risks, including inhalation, absorption, or ingestion of toxic chemicals, drugs, or contaminated foods that may result in nausea, chest pain, eye and tissue irritation, chemical burns, and death; fires and explosions; abuse and neglect; and hazardous lifestyle (presence of booby traps, firearms, poor ventilation). In addition, there are many social issues involved that potentially put children from these environments at risk. The binge-and-crash pattern of using this drug makes it difficult for parents who are users to meet even the basic needs of their children. Children are often not properly supervised. Meals may be forgotten for days at a time while the user is on a binge or in a crash. School problems, criminal behavior, and social isolation can develop for these children. Users of methamphetamine often become paranoid, frustrated, or can be hallucinatory. These behaviors can lead to violence against anyone who happens to be nearby; unfortunately, this is often the child in the home. While on a binge, the user can feel a heightened sexual drive. This can lead to sexual abuse, and children in the home are easy and convenient targets.

## Scope

This bibliography pertains to the impact methamphetamine has on child welfare, including the issues that arise from caregiver use of this drug as well as its direct effects on children.

## Organization

Publications include articles, book chapters, reports, and research briefs and are listed in date descending order. Links are provided to full text publications when possible. However, this collection may not be complete. More information can be obtained in the Child Abuse Library Online.

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# The Effect of Methamphetamine on Children

## A Bibliography

Singh, R. R., Peterson, J. M., Chapman, J., & Saldana, L. (2024). Swimming against the current: addressing community needs and establishing partnerships for the prevention of opioid and methamphetamine use among parents. *Prevention Science*, *25*(1), 193-198. DOI:10.1007/s11121-023-01602-5

The opioid and methamphetamine crises in Oregon have a consequential impact on young families, as an increasing number of parents experience substance use disorder (SUD). As parental substance use escalates, the child welfare system (CWS) becomes overwrought with families who have complex needs. The burden placed on families and on the CWS indicates a need for prevention and treatment interventions for parental SUDs. In response to the worst statewide opioid and methamphetamine epidemics in the USA, a Hybrid Type 2 trial of PRE-FAIR—a prevention intervention for parents—is being implemented in five Oregon counties. Establishing strong partnerships within the communities helped identify the need to implement the evidence-based FAIR treatment model alongside PRE-FAIR. A strong focus on implementation includes meeting the needs of communities and establishing the infrastructure necessary for sustainment of the FAIR programs at the provider agencies. Despite implementation efforts to direct toward PRE-FAIR referrals, parents in need of treatment are being referred at a disproportionate rate, as are older parents who fall outside of study-eligibility. Both challenges have delayed the ability to enroll a sufficient number of participants for the prevention trial. This commentary describes the impact of the opioid and methamphetamine epidemics in Oregon as the crises relate to implementing prevention versus treatment interventions—highlighting the importance of addressing community needs and establishing strong partnerships, which has allowed creative strategies to increase PRE-FAIR recruitment.

Sieger, M. H. L., Becker, J., Nano, X., & Brook, J. P. (2022). Predicting substance use treatment completion & reunification among family treatment court-involved parent–child dyads. *Journal of Public Child Welfare*, *16*(2), 272-294. DOI:10.1080/15548732.2021.1876807

Through intensive, treatment-focused interdisciplinary practice, family treatment courts (FTC) offer a speedier pathway to reunification for families with substance use disorder in the foster care system compared to traditional settings. Less is known regarding differences in outcomes among FTC participants on the basis of clinical risk and need characteristics. We analyzed parent–child dyads in a rural Midwestern FTC program to understand the effect of these key variables on successful treatment completion and family reunification. Results revealed that treatment completion was more likely for parents who reported greater frequency of methamphetamine use in the 30 days prior to treatment entry and less likely for parents who reported more trauma symptoms. Longer time to treatment start from child removal date was associated with a very small increased likelihood of treatment completion as well. Reunification was significantly more likely for parents employed at treatment entry and those who spent more days in treatment. Reunification was less likely for parents who reported more social support and more trauma symptoms at treatment entry. Taken together, these findings suggest that FTC are effective for parents with methamphetamine use disorder, but may see improved outcomes when providing increased supports for parents with severe trauma symptoms.

Oni-Orisan, O. O., Dansereau, L. M., Marsit, C. J., Smith, L. M., Neal, C. R., Della Grotta, S. A., Padbury, J. F., & Lester, B. M. (2021). DNA methylation in children with prenatal methamphetamine exposure and environmental adversity. *Pediatric Research, 89*(5), 1152-1156. DOI:10.1038/s41390-020-1058-4

Methamphetamine (MA) use during pregnancy is a significant public health concern in the United States and affects long-term brain and behavioral development in children. We hypothesized that prenatal MA exposure would be related to greater DNA methylation of HSD11B2 and postnatal environmental stress. The Infant Development, Environment, and

Lifestyle Study (IDEAL), a longitudinal study of prenatal MA exposure enrolled mother-infant dyads in California, Hawaii, Iowa, and Oklahoma. Prenatal exposure was defined by maternal self-report and/or meconium toxicology screening. At ages 10–11 years, 100 children were assessed for drug exposure and DNA methylation of HSD11B2. Hierarchical linear models were used to determine the association between prenatal MA exposure and methylation of HSD11B2 at four CpG sites. Prenatal MA exposure (1.4% vs 0.31%, $P < 0.01$) and early childhood adversity (3.0 vs 2.0, $P < 0.01$) were associated with greater DNA methylation of HSD11B2 at the CpG2 site. The statistically significant effects of early childhood adversity ($B = 0.11$, $P < 0.01$) and prenatal MA exposure ($B = 0.32$, $P = 0.03$) on DNA methylation remained after adjusting for covariates. Prenatal MA exposure is related to postnatal childhood adversity and epigenetic alterations in HSD11B2, an important gene along the stress response pathway suggesting prenatal and postnatal programming effects.

Wright, J., Symons, B., Angell, J., Ross, K. E., & Walker, S. (2021). Current practices underestimate environmental exposures to methamphetamine: Inhalation exposures are important. *Journal of Exposure Science & Environmental Epidemiology, 31*(1), 45-52. DOI:10.1038/s41370-020-00260-x

Current practice for determining the exposure to methamphetamine in contaminated homes relies on the analysis of surface wipe sample to address direct contact exposures. The movement of methamphetamine into the air phase, and the potential for inhalation exposures to occur within residential homes contaminated from former clandestine manufacture or smoking of methamphetamine has been generally poorly 7haracterizin and understood. All available risk-based guidelines for determining safe levels of methamphetamine in residential properties do not include any consideration of the inhalation pathway as an exposure route. This study showed that methamphetamine can readily move from contaminated materials in a home into the air phase. This movement of methamphetamine into the air phase provides both an exposure pathway and a mechanism for the transfer of methamphetamine throughout a property. The inhalation exposure pathway has the potential to result in

significant intake of methamphetamine, adding to dermal absorption and ingestion exposure routes. Guidelines that are established for the assessment of methamphetamine contaminated properties that ignore inhalation exposures can significantly underestimate exposure and result in guidelines that are not adequately protective of health. This study also demonstrates that sampling methamphetamine in air can be undertaken using commercially available sorption tubes and analytical methods.

Chen, T., Spiller, H. A., Badeti, J., Funk, A. R., Zhu, M., & Smith, G. A. (2020). Methamphetamine exposures reported to United States poison control centers, 2000-2019. *Clinical Toxicology*, *59*(8), 705-714. DOI:10.1080/15563650.2020.1861287

The objective was to investigate characteristics and trends of methamphetamine exposures reported to United States (US) poison control centers. Data from the National Poison Data System were analyzed. From January 1, 2000 through December 31, 2019, US poison control centers managed 54,199 cases involving methamphetamine as the first-ranked substance. Adults 20–39 years old accounted for more than half (56.3%) of cases. There were 1,291 deaths, of which 43.0% involved multiple-substance exposures. Among multiple-substance exposures in which methamphetamine was the first-ranked substance, stimulants and street drugs (excluding methamphetamine) were most commonly also present (22.7%), followed by opioids (19.0%). The substance class associated with the most fatalities was opioids (n = 243, 26.6%). The rate of methamphetamine exposures per 100,000 US population increased from 0.6 to 1.1 from 2000–2005, then decreased from 1.1 to 0.4 from 2005–2007, followed by an increase from 0.4 to 2.6 from 2007–2019. From 2007–2019, the rate significantly increased in all US regions, and among all age groups, except among 6–12-year-olds. Also, the rates of single-substance and multiple-substance exposures each increased significantly (both $p < 0.0001$) from 2007–2019, as did the overall methamphetamine fatality rate per 100,000 US population (0.0036 to 0.022, $p < 0.0001$). From 2000–2019, the proportions of cases resulting in admission to a health care facility and serious medical outcome increased from 30.2% to 47.8% ($p < 0.0001$) and from 37.6% to 54.0% ($p < 0.0001$), respectively. The rate of exposure to methamphetamine in the US

declined initially following passage of the Combat Methamphetamine Epidemic Act of 2005. However, since 2007, the rate and severity of exposures to methamphetamine have increased, primarily driven by individuals 20 years or older. Increased prevention efforts are needed, including prevention of methamphetamine initiation among adolescents and young adults, improved access to effective treatment for co-occurring mental health and substance use disorders, and prevention of unintentional exposures among children.

Chu, E. K., Smith, L. M., Derauf, C., Newman, E., Neal, C. R., Arria, A. M., Huestis, M. A., DellaGrotta, S. A., Roberts, M. B., Dansereau, L. M., & Lester, B. M. (2020). Behavior problems during early childhood in children with prenatal methamphetamine exposure. *Pediatrics, 146*(6), e20190270. DOI:10.1542/peds.2019-0270

The effects of in utero methamphetamine exposure on behavioral problems in school-aged children are unclear. Our objective for this study was to evaluate behavior problems in children at aged 3, 5, and 7.5 years who were prenatally exposed to methamphetamine. Subjects were enrolled in the Infant Development, Environment, and Lifestyle study, a longitudinal prospective study of prenatal methamphetamine exposure and child outcomes. Exposed and comparison groups were matched on birth weight, race, education, and health insurance. At ages 3, 5, and 7.5 years, 339 children (171 exposed) were assessed for behavior problems by using the Child Behavior Checklist. Generalized estimating equations were used to determine the effects of prenatal methamphetamine exposure, age, and the interaction of exposure and age on behavior problems. Caregiver psychological symptoms were assessed by using the Brief Symptom Inventory. Analyses adjusted for covariates revealed that relative to age 3, children at 5 years had less externalizing and aggressive behavior and more internalizing behavior, somatic complaints, and withdrawn behavior. By age 7.5, aggressive behavior continued to decrease, attention problems increased and withdrawn behavior decreased. There were no main effects for methamphetamine exposure and no interactions of exposure and age. Caregiver psychological symptoms predicted all behavior problems and the quality of the home predicted externalizing problems and externalizing syndrome scores. Behavioral effects

longitudinally from ages 3 to 7.5 years were not associated with prenatal methamphetamine exposure, whereas caregiver psychological symptoms and the quality of the home were predictors of behavior problems.

Holt, K., & French, G. (2020). Exploring the motherhood experiences of active methamphetamine users. *Crime, Law and Social Change*, *73*(3), 297-314. DOI:10.1007/s10611-019-09862-5

Drug panics involve the emergence of "demon drugs" argued to be symptomatic of larger social and moral breakdown among society. Nowhere is this more evident than the discourse surrounding women methamphetamine users, who are framed by the media as rejecting the central values of American social life, including motherhood and family. While there is substantive research on drug use generally, and some examinations of motherhood, identity, and careers such as initiation, desistance and persistence of drug use, there is far less research addressing how users' life experiences with drugs shape their identity as addicts. The present study employed ethnographic observations and semi-structured interviews in order to explore the roles and identities associated with motherhood in a sample of twenty-eight active female methamphetamine users in a rural southern area. The central research questions are: 1) How do women who are actively using methamphetamine understand and experience motherhood? 2) What role does their drug use play in shaping their identity as mothers? Findings suggest that women draw from larger cultural narratives about motherhood to engage in identity work to minimize the double stigma of being a drug user and a drug user who is a mother. Implications for treatment and policy are discussed.

Wright, J., Kenneally, M., Ross, K., & Walker, S. (2020). Environmental methamphetamine exposures and health effects in 25 case studies. *Toxics, 8*(3), 61. DOI:10.3390/toxics8030061

The clandestine manufacture and use of methamphetamine can result in contamination of residential properties. It is understood that this contamination remains in homes for a significant period, however there are a lack of data available to understand the health effects of exposure to environmental methamphetamine contamination (third-hand exposure). Our study collected information from 63 individuals in 25 separate case studies where the subjects had unwittingly suffered third-hand exposure to methamphetamine from former manufacture, use, or both. Data included environmental contamination data, information on subjects' health effects, and evidence of exposure using hair analysis. This study identified a range of health effects that occur from residing in these properties, including behavioural effects or issues, sleep issues, respiratory effects, skin and eye effects, and headaches. Methamphetamine was detected in hair samples from some individuals, including children. The exposures and concomitant reported health effects covered a wide range of environmental methamphetamine levels in the properties, including low levels close to the current Australian guideline of 0.5 µg methamphetamine/100 cm2. There were no discernible differences between health effects from living in properties contaminated from former manufacture or use. This study demonstrates that residing in these properties can represent a serious public health risk.

Dyba, J., Moesgen, D., Klein, M., & Leyendecker, B. (2019). Mothers and fathers in treatment for methamphetamine addiction—Parenting, parental stress, and children at risk. *Child &nFamily Social Work, 24*(1), 106-114. DOI:10.1111/cfs.12587

Parents addicted to methamphetamine ("crystal meth") are likely to be impaired in meeting parental responsibilities, and the developmental settings can be highly disadvantageous for children. Therefore, parenting by methamphetamine-addicted mothers and fathers needs further exploration, while considering the impact on children affected by parental substance

use. In our study, we analysed parenting practices and parental stress as well as children's behavioural problems using standardized assessments. The sample consisted of 87 methamphetamine-addicted parents in recovery. We obtained data on parents' current substance use and on their psychological distress. Multiple regression analysis was performed to identify predictors of children's overall problems. Parents reported high levels of parental and psychological distress, even after achieving abstinence. Especially depressive perceptions of parenthood appeared problematic. While recovering from methamphetamine addiction, parents exhibited a precarious psychosocial situation and problematic parenting behaviour. Dysfunctional parenting practices were evident in both indifferent and overreactive tendencies. Children were at risk of behavioural and emotional problems. Variables associated with parenting showed significant predictive value for children's overall problems, beyond current substance use, and psychological distress. These findings are discussed in terms of a family-oriented perspective in order to promote parenting capabilities of methamphetamine-addicted parents and to prevent problematic development of their children.

Lebel, C. A., McMorris, C. A., Kar, P., Ritter, C., Andre, Q., Tortorelli, C., & Gibbard, W. B. (2019). Characterizing adverse prenatal and postnatal experiences in children. *Birth Defects Research, 111*(12), 848-858. DOI:10.1002/bdr2.1464

Prenatal and postnatal adversities, including prenatal alcohol exposure (PAE), prenatal exposure to other substances, toxic stress, lack of adequate resources, and postnatal abuse or neglect, often co-occur. These exposures can have cumulative effects, or interact with each other, leading to worse outcomes than single exposures. However, given their complexity and heterogeneity, exposures can be difficult to characterize. Clinical services and research often overlook additional exposures and attribute outcomes solely to one factor. We propose a framework for characterizing adverse prenatal and postnatal exposures and apply it to a cohort of 77 children. Our approach considers type, timing, and frequency to quantify PAE, other prenatal substance exposure, prenatal toxic stress, postnatal threat (harm or threat of harm), and postnatal deprivation (failure to meet basic needs) using a 4-point Likert-type scale.

Postnatal deprivation and harm were separated into early (<24 months of age) and late (≥24 months) time periods, giving seven exposure variables. Exposures were ascertained via health records, child welfare records, interviews with birth parents, caregivers, and/or close family/friends. Nearly all children had co-occurring prenatal exposures, and two-thirds had both prenatal and postnatal adversities. Children with high PAE were more likely to experience late postnatal adversities, and children with other prenatal substance exposure were more likely to have early postnatal deprivation. Postnatal adversities were more likely to co-occur. This framework provides a comprehensive picture of a child's adverse exposures, which can inform assessment and intervention approaches and policy and will be useful for future research.

Meays, B. M., Simpson, J. L., Ramos, A. K., Bevins, R. A., Carlo, G., & Grant, K. M. (2019). Children exposed to methamphetamine in settings where the drug is being used. *Children and Youth Services Review, 104*, 104393. DOI:10.1016/j.childyouth.2019.104393

While children's exposure to methamphetamine is well described in settings where methamphetamine is manufactured, little is known about children's exposure to methamphetamine in settings where methamphetamine is used. Methamphetamine-dependent individuals (N = 124) enrolled from substance use disorder treatment sites completed questionnaires, which included queries about children's exposure to methamphetamine. This descriptive study found that nearly one-third of participants reported methamphetamine was stored in rooms where children may be present, 30% reported children were present when methamphetamine was being used (26% when smoked), and approximately 25% reported children were present when methamphetamine was being sold and/or distributed. Findings from this study emphasize the need to evaluate children who are living in homes where methamphetamine is present such as through a family assessment at the point of initial contact with treatment, criminal justice, or family/child welfare system staff. Employing public health practices to educate adults about the risks that methamphetamine

exposure poses to their children may be a useful motivator to promote substance abuse treatment.

Wright, J., Walker, G. S., & Ross, K. E. (2019). Contamination of homes with methamphetamine: is wipe sampling adequate to determine risk?. *International Journal of Environmental Research and Public Health, 16*(19), 3568. DOI:10.3390/ijerph16193568

Contamination of domestic dwellings from methamphetamine cooking or smoking is an increasing public health problem in many countries. To evaluate the extent of contamination, sampling generally focusses on the collection of surface wipe samples from walls and other surfaces of a potentially contaminated home. Here, we report the contamination levels of many household materials and items sampled from a home that was suspected to be the premises used to cook methamphetamine, it was then sold, lived in for several years by the new owners and then left unattended for several more years. Although the time since the cooking had taken place was significant (over five years), the levels of contamination were extremely high in both household items that were part of the house when cooking was taking place (blinds, carpets, walls, etc.) and also in articles brought to the house post-cooking (rugs, toys, beds, etc.). Both wipe sampling and analysis of bulk samples indicate that the methamphetamine is not breaking down or being removed and is transferred from contaminated to non-contaminated objects. These results raise questions about the adequacy of characterizing contamination and of making decisions about the extent of remediation required based solely on surface wipe samples. Without fully understanding the extent of contamination that is present, not only on surfaces but within the building materials, it is difficult to ensure that the correct and most effective remedial approaches are taken to appropriately determine and address the risks to inhabitants.

Akin, B. A., Brook, J., & Lloyd, M. H. (2015). Examining the role of methamphetamine in permanency: A competing risks analysis of reunification, guardianship, and adoption. *American Journal of Orthopsychiatry, 85*(2), 119-130. DOI:10.1037/ort0000052

Parental methamphetamine use has drawn significant attention in recent years. Despite prior research that shows that parental substance abuse is a risk factor for lengthy foster care stay, little is known about the effect of specific types of substance use on permanency. This study sought to compare the impact of parental methamphetamine use to alcohol use, other drug use, and polysubstance use on the timing of 3 types of permanency: reunification, guardianship, and adoption. Using an entry cohort of 16,620 children who had entered foster care during a 5-year period, competing risks event history models were conducted for each permanency type. Findings showed that, after controlling for several case characteristics, parent illicit drug use significantly impacted the timing of the 3 types of permanency, but alcohol use did not. Methamphetamine, other drug, and polysubstance with methamphetamine use were associated with lower rates of reunification and higher rates of adoption. Guardianship was also predicted by other drug and polysubstance use without methamphetamine; however, methamphetamine use was not associated with guardianship. Notably, the methamphetamine groups comprised the youngest children and had the shortest median time to adoption. Results suggest that type of parental substance use is predictive of permanency exits and that parental illicit drug use may require tailored strategies for improving permanency outcomes. Further implications of the findings are discussed.

Rodi, M. S., Killian, C. M., Breitenbucher, P., Young, N. K., Amatetti, S., Bermejo, R., & Hall, E. (2015). New approaches for working with children and families involved in Family Treatment Drug courts. *Child Welfare*, *94*(4), 205-232.

This is a descriptive study of the Children Affected by Methamphetamine (CAM) grant program, a federally funded effort to improve outcomes through the addition of targeted interventions for 1,940 families, including 2,596 adults and 4,245 children involved in 12 diverse Family Treatment Drug Courts (FTDCs) located across six U.S. states. The majority were children

of parents with a primary methamphetamine use disorder. Findings reflect grantees' reporting on 18 performance indicators of child safety and permanency, adult recovery, and family well-being. Additional information gleaned from grantees' biannual reports provides insights about program implementation. Results, drawn from this large and complex dataset, indicate that comprehensively addressing families' needs is associated with better outcomes than those experienced by similarly situated families in grantees' communities and the nation overall. In addition to describing common program components and outcomes, this article presents important lessons learned about implementing evidence-based children's services in the FTDC context, as well as future directions for research and evaluation in this arena.

Lloyd, M. H., & Akin, B. A. (2014). The disparate impact of alcohol, methamphetamine, and other drugs on family reunification. *Children and Youth Services Review*, *44*, 72-81. DOI:10.1016/j.childyouth.2014.05.013

Parental substance abuse is one of the most prominent reasons that children enter foster care. The relative role of substance type in delaying reunification has remained elusive. This study sought to understand the impact of parental use of alcohol, methamphetamine, other drugs, and poly-substances on reunification rates for children in foster care. The authors used administrative foster care data from a Midwestern state between years 2007 and 2012 to evaluate the unique contribution of each substance use domain. Results suggest that parental methamphetamine use has the most significant impact on the likelihood of reunification, followed by other drugs, and poly-substances. These findings further indicate that children removed due to any parental drug use stay in foster care for an average of 49–156 days longer than their peers. Implications for research and practice are addressed.

Messina, N., Jeter, K., Marinelli-Casey, P., West, K., & Rawson, R. (2014). Children exposed to methamphetamine use and manufacture. *Child Abuse & Neglect*, *38*(11), 1872–1883. DOI:10.1016/j.chiabu.2006.06.009

Sheridan, K. (2014). A systematic review of the literature regarding family context and mental health of children from rural methamphetamine-involved families: Implications for rural child welfare practice. *Journal of Public Child Welfare*, *8*(5), 514-538. DOI:10.1080/15548732.2014.948584

This review of the literature aims to guide practitioners concerned with ameliorating the psychosocial effects for rural-dwelling children from homes where methamphetamine is used or produced. Although a substantial body of research exists regarding the environmental dangers and physical health risks to children from methamphetamine-affected homes, there is a paucity of research regarding child psychosocial outcomes. This article summarizes the published literature examining family contexts and psychological and behavioral consequences for children. Implications of this body of knowledge for child welfare practitioners, limitations of the studies reviewed, and future research directions are discussed.

Wouldes, T. A., LaGasse, L. L., Huestis, M. A., DellaGrotta, S., Dansereau, L. M., & Lester, B. M. (2014). Prenatal methamphetamine exposure and neurodevelopmental outcomes in children from 1 to 3 years. *Neurotoxicology and Teratology*, *42*, 77-84. DOI:10.1016/j.ntt.2014.02.004

Despite the evidence that women world-wide are using methamphetamine (MA) during pregnancy little is known about the neurodevelopment of their children. The controlled, prospective longitudinal New Zealand (NZ) Infant Development, Environment and Lifestyle (IDEAL) study was carried out in Auckland, NZ. Participants were 103 children exposed to MA prenatally and 107 not exposed. The Mental Developmental Index (MDI) and the Psychomotor Developmental Index (PDI) of the Bayley Scales of Infant Development, Second Edition (BSID-II) measured cognitive and motor performance at ages 1, 2 and 3, and the Peabody Developmental Motor Scale, Second Edition (PDMS-II) measured gross and fine motor performance at 1 and 3. Measures of the child's environment included the Home Observation of Measurement of the Environment and the Maternal Lifestyle Interview. The Substance Use Inventory measured maternal drug use. After controlling for other drug use and contextual factors, prenatal MA exposure was associated with poorer motor performance at 1 and 2 years

on the BSID-II. No differences were observed for cognitive development (MDI). Relative to non-MA exposed children, longitudinal scores on the PDI and the gross motor scale of the PDMS-2 were 4.3 and 3.2 points lower, respectively. Being male and of Maori descent predicted lower cognitive scores (MDI) and being male predicted lower fine motor scores (PDMS-2) Prenatal exposure to MA was associated with delayed gross motor development over the first 3 years, but not cognitive development. However, being male and of Maori descent were both associated with poorer cognitive outcomes. Males in general did more poorly on tasks related to fine motor development.

Castaneto, M. S., Barnes, A. J., Scheidweiler, K. B., Schaffer, M., Rogers, K. K., Stewart, D., & Huestis, M. A. (2013). Identifying methamphetamine exposure in children. *Therapeutic Drug Monitoring*, *35*(6), 823–830. DOI:10.1097/FTD.0b013e31829685b2

Methamphetamine (MAMP) use, distribution and manufacture remain a serious public health and safety problem in the United States, and children environmentally exposed to MAMP face a myriad of developmental, social and health risks, including severe abuse and neglect necessitating child protection involvement. It is recommended that drug-endangered children receive medical evaluation and care with documentation of overall physical and mental conditions and have urine drug testing. The primary aim of this study was to determine the best biological matrix to detect environmentally exposed children. 91 children, environmentally exposed to household MAMP intake, were medically evaluated at the Child and Adolescent Abuse Resource and Evaluation (CAARE) Diagnostic and Treatment Center at the University of California, Davis (UCD) Children's Hospital. MAMP, AMP, MDMA, MDA and MDEA were quantified in urine and oral fluid (OF) by gas chromatography mass spectrometry (GCMS) and in hair by liquid chromatography tandem mass spectrometry (LCMSMS). Overall drug detection rates in OF, urine and hair were 6.9%, 22.1% and 77.8%, respectively. Seventy children (79%) tested positive for 1 or more drugs in 1 or more matrices. MAMP was the primary analyte detected in all 3 biological matrices. All positive OF (n=5) and 18 of 19 positive urine specimens also had a positive hair test. Hair analysis offered a more sensitive tool for identifying MAMP, AMP and

MDMA environmental exposure in children than urine or OF testing. A negative urine, or hair test does not exclude the possibility of drug exposure, but hair testing provided the greatest sensitivity for identifying drug-exposed children.

Twomey, J., LaGasse, L., Derauf, C., Newman, E., Shah, R., Smith, L., Arria, A., Huestis, M., DellaGrotta, S., Roberts, M., Dansereau, L., Neal, C., & Lester, B. (2013). Prenatal methamphetamine exposure, home environment, and primary caregiver risk factors predict child behavioral problems at 5 years. *American Journal of Orthopsychiatry, 83*(1), 64-72. DOI:10.1111/ajop.12007

This study investigated the prospective association between prenatal methamphetamine (MA) exposure and child behavioral problems at 5 years while also examining the home environment at 30 months and several primary caregiver (PC) risk factors. Participants were 97 MA-exposed and 117 comparison children and their PCs enrolled in the Infant Development, Environment and Lifestyle Study. Hypotheses were that child behaviors would be adversely impacted by (a) prenatal MA exposure, (b) home environments that provided less developmental stimulation and emotional responsiveness to the child, and (c) the presence of PC psychological symptoms and other risk factors. Prenatal MA exposure was associated with child externalizing behavioral problems at 5 years. Home environments that were more conducive to meeting children's developmental and emotional needs were associated with fewer internalizing and externalizing behavioral problems. Independent of prenatal MA exposure, PC parenting stress and psychological symptoms were associated with increased child behavioral problems. Findings suggest prenatal MA exposure may contribute to externalizing behavioral problems in early childhood and the importance of considering possible vulnerabilities related to prenatal MA exposure in the context of the child's caregiving environment.

Carlson, B. E., Williams, L. R., & Shafer, M. S. (2012). Methamphetamine-involved parents in the child welfare system: Are they more challenging than other substance-involved parents?. *Journal of Public Child Welfare*, *6*(3), 280-295. DOI:10.1080/15548732.2012.683361

Although methamphetamine use has been declining, it continues to be problematic among parents in the child welfare system. We examined the assertion that parental methamphetamine use is more detrimental for children than abuse of other substances. Using administrative data (N = 2,465) from a treatment program, we compared parents reporting abuse of methamphetamine (48%) with parents reporting alcohol only (11%) or abuse of other illegal drugs (41%) on a number of variables. Methamphetamine users were more likely to be female, White, have less education, be unemployed, and not be in a committed relationship, and their children were significantly more likely to be placed.

Derauf, C., LaGasse, L. L., Smith, L. M., Newman, E., Shah, R., Neal, C. R., Arria, A. M., Huestis, M. A., Dellagrotta, S., Dansereau, L. M., Lin, H., & Lester, B. M. (2012). Prenatal methamphetamine exposure and inhibitory control among young school-age children. *The Journal of Pediatrics*, *161*(3), 452-459. DOI:10.1016/j.jpeds.2012.02.002

To examine the association between prenatal methamphetamine exposure and inhibitory control in 66-month-old children followed since birth in the multicenter, longitudinal Infant Development, Environment, and Lifestyle study. The sample included 137 children with prenatal methamphetamine exposure and 130 comparison children matched for race, birth weight, maternal education, and type of insurance. Inhibitory control, an executive function related to emotional and cognitive control, was assessed using a computerized Stroop-like task developed for young children. Hierarchical linear modeling tested the relationship between the extent of prenatal methamphetamine exposure (heavy, some, or none) and accuracy and reaction time outcomes, adjusting for prenatal exposure to alcohol, tobacco, and marijuana; age; sex; socioeconomic status; caregiver IQ and psychological symptoms; Child Protective Services report of physical or sexual abuse; and site. In adjusted analyses, heavy prenatal methamphetamine exposure was related to reduced accuracy in both the incongruent and

mixed conditions on the Stroop-like task. Caregiver psychological symptoms and Child Protective Services report of physical or sexual abuse were associated with reduced accuracy in the incongruent and mixed conditions and in the incongruent conditions, respectively. Heavy prenatal methamphetamine exposure, along with caregiver psychological distress and child maltreatment, are related to subtle deficits in inhibitory control during the early school-age years.

Messina, N., & Jeter, K. (2012). Parental methamphetamine use and manufacture: Child and familial outcomes. *Journal of Public Child Welfare*, *6*(3), 296-312. DOI:10.1080/15548732.2012.683364

The children of methamphetamine (MA) users and manufacturers are at high risk of neglect and abuse and physical harm from exposure to the drug and the chemicals used to produce it. This study is the first to document the epidemiology of children removed from home-based MA labs and their familial outcomes. Analyses are predominantly descriptive for 99 cases of drug-endangered children recorded from 2001–2003 in Los Angeles County. Neglect was substantiated in 93% of the cases; 97% of the cases resulted in child protective services detainment. Eighty percent had a documented medical diagnosis, most often related to exposure to MA manufacture.

Pennar, A. L., Shapiro, A. F., & Krysik, J. (2012). Drug endangered children: Examining children removed from methamphetamine laboratories. *Children and Youth Services Review*, *34*(9), 1777-1785. DOI:10.1016/j.childyouth.2012.05.006

Children removed from methamphetamine laboratories are a severely understudied population despite the widespread deprivation parental methamphetamine abuse has on children, particularly in homes where methamphetamine is produced. A sample of 144 children removed from their homes during the seizure of methamphetamine laboratories, as part of the Arizona Drug Endangered Children program, was investigated. Results indicate that younger

children were more likely to be determined by Child Protective Services as high or moderate risk of further abuse, test positive for methamphetamine, and have maternal alleged perpetrators of abuse. Older children were more likely to be designated low risk for further abuse, test negative for methamphetamine, and have paternal alleged perpetrators of abuse. Results also show that children initially placed in foster care were more likely to remain in foster care at the final assessment than to be living with a parent or kin. These findings have implications for individuals working with children removed from homes with methamphetamine laboratories, and recommendations based on study findings are offered to child and family advocates and interventionists.

Moller, M., Koren, G., Karaskov, T., & Garcia-Bournissen, F. (2011). Examining the health and drug exposures among Canadian children residing in drug-producing homes. *The Journal of Pediatrics*, *159*(5), 766-770. DOI:10.1016/j.jpeds.2011.05.044

Starting in January 2006, children identified by police and the Children's Aids Society in the York region of Ontario, Canada, were referred to the Motherisk Program at the Hospital for Sick Children for pediatric assessment of their general health and well-being, with specific focus on illicit-drug exposure. We used a standard protocol to collect all available medical and environmental history, conducted physical and neurologic examinations, and collected hair for analysis of illicit drugs. In total, 75 children, at the mean age of 6.5 years, were referred to us after being removed from homes where marijuana was grown (80%) or other operations linked to drug production were occurring (20%). Overall, rates of health issues in this cohort fell below reference values for Canadian children. Of the hair tests, 32% were positive for illicit substances. In the majority there were no clinical symptoms related to these drugs. The majority of children removed from drug-producing homes were healthy and drug free. Comprehensive evaluations should be performed on a case-by-case basis in order to determine what is ultimately in the best interest of the child.

Roussotte, F. F., Bramen, J. E., Nunez, S. C., Quandt, L. C., Smith, L., O'Connor, M. J., Bookheimer, S. Y., & Sowell, E. R. (2011). Abnormal brain activation during working memory in children with prenatal exposure to drugs of abuse: The effects of methamphetamine, alcohol, and polydrug exposure. *Neuroimage*, *54*(4), 3067-3075. DOI:10.1016/j.neuroimage.2010.10.072

Structural and metabolic abnormalities in fronto-striatal structures have been reported in children with prenatal methamphetamine (MA) exposure. The current study was designed to quantify functional alterations to the fronto-striatal circuit in children with prenatal MA exposure using functional magnetic resonance imaging (fMRI). Because many women who use MA during pregnancy also use alcohol, a known teratogen, we examined 50 children (age range 7–15), 19 with prenatal MA exposure, 15 of whom had concomitant prenatal alcohol exposure (the MAA group), 13 with heavy prenatal alcohol but no MA exposure (ALC group), and 18 unexposed controls (CON group). We hypothesized that MA exposed children would demonstrate abnormal brain activation during a visuospatial working memory (WM) "N-Back" task. As predicted, the MAA group showed less activation than the CON group in many brain areas, including the striatum and frontal lobe in the left hemisphere. The ALC group showed less activation than the MAA group in several regions, including the right striatum. We found an inverse correlation between performance and activity in the striatum in both the CON and MAA groups. However, this relationship was significant in the caudate of the CON group but not the MAA group, and in the putamen of the MAA group but not the CON group. These findings suggest that structural damage in the fronto-striatal circuit after prenatal MA exposure leads to decreased recruitment of this circuit during a WM challenge, and raise the possibility that a rewiring of cortico-striatal networks may occur in children with prenatal MA exposure.

Haight, W., Black, J., & Sheridan, K. (2010). A mental health intervention for rural, foster children from methamphetamine-involved families: Experimental assessment with qualitative elaboration. *Children and Youth Services Review*, *32*(10), 1446-1457. DOI:10.1016/j.childyouth.2010.06.024

The misuse of methamphetamine, a powerful central nervous system stimulant and neurotoxin (Wermuth, 2000; Rawson, Gonzales, & Brethen, 2002; SAMHSA, 1999), is a sizeable and ongoing criminal justice and public health problem across the U.S. (Cretzmeyer, Sarrazin, Huber, Block, & Hall 2003; Hohman, Oliver, & Wright, 2004; National Drug Intelligence Center, 2009); especially in rural areas (Adrian, 2003; F.B.I., 2006; Hutchison & Blakely, 2003; Illinois Criminal Justice Information Authority, 2004; Muskie School of Public Service, 2007). Methamphetamine misuse affects not just individuals, but entire families. Rural law enforcement officers and health, mental health, and child welfare professionals encounter children living in homes where their parents produce and/or misuse methamphetamine (Shillington, Hohman, & Jones, 2002; Haight, Jasonsen, Black, Kingery, Sheridan & Mulder, 2005). These children are at risk for the development of substance abuse and other mental health disorders (e.g., Haight, Ostler, Black & Kingery, 2009). If untreated or undertreated, these problems could jeopardize children's future well-being and mental health, and perpetuate substance misuse into future generations. Although there are a variety of effective mental health interventions for children, there are challenges to implementing them with rural children from drug-involved families including limited access to services and cultural appropriateness. This paper describes the cultural-adaptation, implementation and impact of an evidence-informed mental health intervention for individual rural children aged 7-17 from methamphetamine-involved families who are in foster care. It also considers the feasibility of the intervention, and its merits for future study.

Haight, W., Marshall, J., Hans, S., Black, J., & Sheridan, K. (2010). "They mess with me, I mess with them": Understanding physical aggression in rural girls and boys from methamphetamine-involved families. *Children and Youth Services Review*, *32*(10), 1223-1234. DOI:10.1016/j.childyouth.2010.04.010

This paper examines the mental health, and experiences of physical aggression in school-aged girls and boys from rural families involved with methamphetamine and the child welfare system. The misuse of methamphetamine, a powerful central nervous system stimulant and neurotoxin (Wermuth, 2000; Rawson, Gonzales, & Brethen, 2002; SAMHSA, 2002), is a sizeable and ongoing criminal justice and public health problem across the U.S. (Cretzmeyer, Sarrazin, Huber, Block, & Hall 2003; Hohman, Oliver, & Wright, 2004). In 2008, methamphetamine lab seizures nation-wide increased for the first time since 2003 (National Drug Intelligence Center, 2009). Methamphetamine misuse may be especially problematic in rural areas (Adrian, 2003;Illinois Criminal Justice Information Authority, 2004;F.B.I., 2006) where adolescents (Hutchison & Blakely, 2003) and young adults (Muskie School of Public Service, 2007) misuse this drug at approximately twice the rate of their urban counterparts.

Ostler, T., Bahar, O. S., & Jessee, A. (2010). Mentalization in children exposed to parental methamphetamine abuse: Relations to children's mental health and behavioral outcomes. *Attachment & Human Development*, *12*(3), 193-207. DOI:10.1080/14616731003759666

This study examined the mentalization capabilities of children exposed to parental methamphetamine abuse in relation to symptom underreporting, mental health, and behavioral outcomes. Twenty-six school-aged children in foster care participated in this study. Mentalization was assessed using the My Family Stories Interview (MFSI), a semi-structured interview in which children recalled family stories about a happy, sad or scary and fun time. An established scale of the Trauma Symptom Checklist for Children (TSCC), a self-report measure, provided information on children's symptom underreporting. The Child Behavior Checklist (CBCL), completed by the children's foster caregivers, assessed children's mental health and behavioral outcomes. Children with higher mentalization were significantly less

prone to underreport symptoms. These children had fewer mental health problems and were rated by their foster caregivers as more socially competent. The findings underscore that mentalization could be an important protective factor for children who have experienced parental substance abuse.

Watanabe-Galloway, S., Ryan, S., Hansen, K., Hullsiek, B., Muli, V., & Malone, A. C. (2009). Effects of methamphetamine abuse beyond individual users. *Journal of Psychoactive Drugs, 41*(3), 241-248. DOI:10.1080/02791072.2009.10400534

Since 1997, the use of methamphetamine as a drug of abuse has been widespread in the United States. While several forms of amphetamine are useful in some areas of medicine, methamphetamine as an abused substance is associated with severe and multifaceted consequences. Problems associated with the abuse of amphetamine and its derivatives such as methamphetamine have been well documented. As the manufacture and use of methamphetamine across the United States has increased, the impact of methamphetamine abuse has been felt beyond individual users; families as well as communities can be seriously affected. An increase in child neglect and violence as well as a lack of resources for health care, social services, and law enforcement because of methamphetamine abuse have been reported by many communities. This study examines the historical spread of methamphetamine misuse in the United States and the resulting individual, social, and environmental consequences. A public health perspective on family, community, and social aspects is offered, and ideas for future research and policy changes are explored.

Asanbe, C. B., Hall, C., & Bolden, C. D. (2008). The methamphetamine home: Psychological impact on preschoolers in rural Tennessee. *The Journal of Rural Health*, *24*(3), 229-235. DOI:10.1111/j.1748-0361.2008.00163.x

A growing number of children reside with methamphetamine-abusing parents in homes where the illicit drug is produced. Yet, the effects of a methamphetamine environment on

psychological child outcome are still unknown. To examine whether preschoolers who lived in methamphetamine-producing homes are at increased risk for developing psychological problems. The participants were 58 white children between the ages of 4 and 5 years; 31 with a history of living in methamphetamine-producing homes and 27 children who live in non-methamphetamine producing homes in rural Tennessee. The groups were similar in age, gender, and socioeconomic background. The groups were compared for behavioral and emotional adjustment using the behavior assessment system for children-parent rating scale-preschool (BASC-PRS-P) form. Biological or custodian parents completed a rating on their preschoolers that provided information about the children's pattern of behavior and feelings. Preschoolers from the methamphetamine-producing homes showed more externalizing problems than their peers, but were comparable on internalizing problems. On specific behaviors, the data indicate that preschoolers in the methamphetamine group showed higher aggression symptoms than their peers from non-methamphetamine-producing homes. These findings, if replicated, point to the need for mental health screening when a child is removed from a methamphetamine-producing home.

McGuinness, T. M., & Pollack, D. (2008). Parental methamphetamine abuse and children. *Journal of Pediatric Health Care*, *22*(3), 152-158. DOI:10.1016/j.pedhc.2007.04.009

Methamphetamine has alluring properties, such as the ability to promote weight loss and wakefulness, and because of its low price and ease of synthesis, methamphetamine abuse is now a nationwide problem in the United States. Unfortunately, the scope of the problem extends beyond adult users to the children of parents who are users. As methamphetamine abuse increases, the consequences of the epidemic pose major health and child welfare concerns. This article describes methamphetamine abuse and the long-term consequences of use, as well as specific nursing interventions to mitigate its effects.

Connell-Carrick, K. (2007). Methamphetamine and the changing face of child welfare: Practice principles for child welfare workers. *Child Welfare*, *86*(3), 125-144.

Methamphetamine use and production is changing child welfare practice. Methamphetamine is a significant public health threat (National Institute of Justice, 1999) reaching epidemic proportions (Anglin, Burke, Perrochet, Stamper, & Dawud-Nouris, 2000). The manufacturing of methamphetamine is a serious problem for the child welfare system, yet child welfare has not addressed the needs of children living in homes where methamphetamine is manufactured (U.S. Department of Justice, 2002; DOJ, 2003; Altshuler, 2005). This article presents key issues for child welfare workers related to the use, production, and effects of rnethamphetamine on children and families, and identifies practice principles for child welfare workers in order to ensure safety for victims, parents, and workers themselves.

Farst, K., Duncan, J. M., Moss, M., Ray, R. M., Kokoska, E., & James, L. P. (2007). Methamphetamine exposure presenting as caustic ingestions in children. *Annals of Emergency Medicine, 49*(3), 341-343. DOI:10.1016/j.annemergmed.2006.05.020

With the growing prevalence of methamphetamine use and production in home laboratories, children are at risk for injuries resulting from living in a drug-endangered environment. Although the ingestion of household cleaners is usually accidental and not a result of illicit drug use or production, medical providers must be aware of the chemicals associated with methamphetamine and illicit drug production to identify patients harmed in this environment. We present the first reported cases of children harmed by ingesting caustic substances used in the production of methamphetamine in the home.

Grant, P. (2007). Evaluation of children removed from a clandestine methamphetamine laboratory. *Journal of Emergency Nursing*, *33*(1), 31-41. DOI:10.1016/j.jen.2006.12.003

The illicit manufacturing and use of methamphetamine continues to be a significant and growing problem in the United States. Children are often found in homes where this activity is

occurring and are affected by it on many levels. This article will provide background information on the manufacturing of methamphetamine, including classes of chemicals involved; hazards inherent to the manufacturing process and its effects on those living in a clandestine laboratory; and the approach to children found in these homes and their medical care. The focus will be on care in the acute settings with the introduction of a protocol for evaluation and follow-up of these patients.

Haight, W., Ostler, T., Black, J., Sheridan, K., & Kingery, L. (2007). A child's-eye view of parent methamphetamine abuse: Implications for helping foster families to succeed. *Children and Youth Services Review*, *29*(1), 1-15. DOI:10.1016/j.childyouth.2006.03.007

This report focuses on the experiences and perspectives of rural, Midwestern children aged 7–14 years who were involved with the public child welfare system because of their parents' methamphetamine abuse. Eighteen children participated in semi-structured, in-depth interviews focusing on their families of origin. Children reported exposure not only to their parents' and non-kin adults' methamphetamine and other substance abuse, but to a constellation of activities related to drug use or drug seeking behavior including violence within their homes and other criminal behavior. Children responded to the contexts in which they were reared in a variety of ways including accepting or actively resisting socialization messages that normalized substance abuse. The majority of children described involvement with law enforcement and child welfare as a "sad" and "scary" time in their families. Far from embracing their placement within safe and stable families, many children continued to express sadness, distress and resistance to legal and child welfare interventions even after months in foster care. Implications for facilitating the adjustment of children to foster care and beyond are discussed including providing foster parents with support and information about the contexts in which children have been reared and children's understanding of those contexts in order that they may interpret and respond to challenges that may emerge.

Matteucci, M. J., Auten, J. D., Crowley, B., Combs, D., & Clark, R. F. (2007). Methamphetamine exposures in young children. *Pediatric Emergency Care*, *23*(9), 638-640. DOI:10.1097/PEC.0b013e31814a6a79

Methamphetamine abuse is reaching epidemic proportions. As this occurs, the likelihood of accidental poisoning in children increases. We sought to evaluate the presentation, treatment, and outcome of pediatric methamphetamine exposures reported to the California Poison Control System. This is a retrospective review of California Poison Control System records for methamphetamine exposure from 2000 through 2004. All charts of patients identified as younger than 6 years were reviewed and abstracted. The charts of 47 children younger than 6 years were identified and reviewed. Three were coded as minor effects, 3 as major effects, and 16 as moderate effects. The remainder of the charts were not evaluated because of no effect (n = 6), unrelated or confirmed nonexposure (n = 3), or unable to follow (n = 16). The most common presenting symptom was agitation (82%), whereas seizures were documented in only 2 cases (9%). Tachycardia was common (mean heart rate, 171 beats/min; confidence interval [CI], 154-187), whereas blood pressure (BP) (mean systolic BP, 120 mm Hg; CI, 104-136; and mean diastolic BP, 70 mm Hg; CI, 51-88) and rectal temperature (mean, 37.4°C; CI, 36.9-37.9) were slightly elevated compared with normal values. Creatinine was documented in 6 cases and noted as normal in all (0.3IU/L; CI, 0.2-0.4), whereas creatine kinase was documented in 3 charts and elevated in all (mean 1984 IU/L; range, 212-4942 IU/L). Most cases (55%) received benzodiazepines as treatment, although only 2 received activated charcoal. Symptoms persisted for an average of 22 hours (CI, 16.3-27.2). No deaths were reported. In this series of children, methamphetamine exposure was strongly associated with agitation that was successfully treated with benzodiazepines. Tachycardia was common, although hypertension and hyperthermia were not. Laboratory studies were not routinely recorded. The clinical significance of elevated creatine kinase concentrations recorded in 3 children is unclear.

Messina, N., Marinelli-Casey, P., West, K., & Rawson, R. (2007). Children exposed to methamphetamine use and manufacture. *Child Abuse & Neglect*, *38*(11), 1872–1883. DOI:10.1016/j.chiabu.2006.06.009

Ostler, T., Haight, W., Black, J., Choi, G. Y., Kingery, L., & Sheridan, K. (2007). Case series: Mental health needs and perspectives of rural children reared by parents who abuse methamphetamine. *Journal of the American Academy of Child & Adolescent Psychiatry*, *46*(4), 500-507. DOI:10.1097/chi.0b013e3180306298

This case-based, mixed-methods study was undertaken to understand the perspectives and mental health needs of rural children exposed to parental methamphetamine abuse. Participants were 23 children involved with a state child protective agency because of parental methamphetamine abuse. A semistructured interview provided information on children's perspectives of their families. Information on children's mental health needs was obtained from the Child Behavior Checklist and Trauma Symptom Checklist. Case records and caseworker reports provided information on children's family experiences. Children described emotional pain; few social resources for coping with emotions, problem solving, or talking about their experiences; and avoidant or passive coping skills. Sixty-five percent of children evidenced significant dissociative or posttraumatic symptoms on standardized assessments; 57% had other significant emotional and behavioral problems. Challenges to understanding children's perspectives included children's perceptions that talking about methamphetamine abuse was taboo and underreporting of significant symptoms on the Trauma Symptom Checklist. The high rate of mental health problems suggests the need for nontraditional strategies for services delivery in rural areas that are targeted toward these vulnerable children. Early identification and treatment of mental health problems should be a priority. Clinicians should be alert to the complexities in assessing children's mental health needs.

Arria, A. M., Derauf, C., Lagasse, L. L., Grant, P., Shah, R., Smith, L., Haning, W., Huestis, M., Strauss, A., Grotta, S. D., Liu, J., & Lester, B. (2006). Methamphetamine and other substance use during pregnancy: Preliminary estimates from the infant development, environment, and lifestyle (IDEAL) study. *Maternal and Child Health Journal, 10*(3), 293-302. DOI:10.1007/s10995-005-0052-0

Objectives: Methamphetamine use is a continuing problem in several regions of the United States and yet few studies have focused on pre-natal methamphetamine exposure. The purpose of this study was to estimate the prevalence and correlates of alcohol, tobacco, and other sub-stance use-including methamphetamine-during pregnancy. Methods: The sample consisted of the first 1632 eligible mothers who consented to participate in a large-scale multisite study focused on prenatal methamphetamine exposure. This unselected screening sample included both users and nonusers of alcohol, tobacco, methamphetamine, and other drugs. Substance use was determined by maternal self-report and/or GC/MS confirmation of a positive me-conium screen. Results: Overall, 5.2% of women used methamphetamine at some point during their pregnancy. One quarter of the sample smoked tobacco, 22.8% drank alcohol, 6.0% used marijuana, and 1.3% used barbiturates prenatally. Less than 1% of the sample used heroin, benzodiazapenes, and hallucinogens. Multivariate modeling results showed that tobacco smokers and illicit drug users were more likely to be single and less educated, have attended less than 11 prenatal visits, and utilize public financial assistance. Conclusions: This is the first large-scale investigation to report the prevalence of methamphetamine use during pregnancy in areas of the United States where methamphetamine is a notable concern. Follow-up research is ongoing to investigate the outcomes associated with pre-natal methamphetamine exposure. Given that this research extends and confirms previous findings showing that high-risk groups of pregnant women can be identified on the basis of basic demographic characteristics, targeted interventions are greatly needed to reduce serious ad-verse outcomes associated with prenatal alcohol and tobacco use. (Author Abstract)

Brown, J. A., & Hohman, M. (2006). The impact of methamphetamine use on parenting. *Journal of Social Work Practice in the Addictions*, *6*(1-2), 63-88. DOI:10.1300/J160v06n01_04

Children whose parents abuse substances are often exposed to chaotic and neglectful lifestyles. Because of the increase in methamphetamine abuse, especially by females of child-bearing age, it is important to understand how the use of this drug impacts parenting. In this qualitative study, ten parents being treated for methamphetamine abuse were interviewed. Results indicated that while using, parents utilized a polarized style of parenting and specific drug management strategies, allowed exposure to violence, created upheaval in their children's daily living structure, and felt ambivalence when discussing these effects on children. Implications for social work practice include early intervention focusing on strengthening parenting skills.

Altshuler, S. J. (2005). Drug-endangered children need a collaborative community response. *Child Welfare, 84*(2), 171-190.

The United States is facing an epidemic of the use of methamphetamine drugs. Child welfare has not yet addressed the needs of the children living in so-called "meth homes." These children are endangered not only from the chemicals involved, but also from parental abuse and neglect. Communities are recognizing the need for inter-agency collaboration to address the consequences of this epidemic. Spokane, Washington, has created a Drug-Endangered Children Project, whose mission is to implement a collaborative response among law enforcement, prosecutorial, medical, and social service professionals to the needs of drug-endangered children. This article presents the findings from the evaluation of the first year of the project, including a baseline assessment of the needs of drug-endangered children and the extent of community-based collaboration achieved. This article makes recommendations for future community-based partnerships to improve the well-being of drug-endangered children.

Hohman, M., Oliver, R., & Wright, W. (2004). Methamphetamine abuse and manufacture: The child welfare response. *Social Work, 49*(3), 373-381. DOI:10.1093/sw/49.3.373

Methamphetamine abuse is on the rise, particularly by women of childbearing age. This article describes the history and effects of methamphetamine use. The authors examine the ways exposure to the manufacture of this drug affects clients and social workers in the course of their work. Because children are frequently found at the scene of a manufacturing laboratory, the child welfare system often becomes involved, and child protective services and other social work agencies need protocols to address the needs of the children and their parents, as well as those of the legal system. In 1997 California created and implemented drug-endangered children's units in seven counties to address the needs of children from families that manufacture methamphetamine; these units involve collaborative efforts among child protective workers, district attorneys, physicians, and police officers. A case example provides information about the role of social workers and their collaboration with these multiple systems.

Cohen, J. B., Dickow, A., Horner, K., Zwe-ben, J. E., Balabis, J., Vandersloot, D., & Reiber, C. (2003). Abuse and violence history of men and women in treatment for methamphetamine dependence. *American Journal of Addictions, 12*(5), 377-385. DOI:10.1080/10550490390240701

The Methamphetamine Treatment Project offers the opportunity to examine the history of abuse and violence in a sample of 1016 methamphetamine users participating in a multi-site study between 1999-2001. Reporting of abuse and violence was extensive, with 80% of women reporting abuse or violence from a partner. Men were more likely to report experiencing violence from friends and others. A high percent-age of study participants reported a variety of threatening or coercive experiences with their partners. Past and current interpersonal violence is a characteristic of the lifestyles of the majority entering treatment for methamphetamine dependence.

Swetlow, K. (2003). Children at clandestine methamphetamine labs: Helping meth's youngest victims. *OVC Bulletin*, 1-11. U.S. Department of Justice.

Children who exposed to the chemicals used for making methamphetamine face acute health and safety risks, including physical, emotional, and sexual abuse and medical neglect. The normal activities of young children increase the likelihood that they will inhale, absorb, or ingest toxic chemicals, drugs, or contaminated food. Their physiological characteristics leave them particularly vulnerable to the effects of toxic chemical exposures. Exposure places infants at increased risk for neurological abnormalities and respiratory problems. Personnel involved in laboratory seizures should include or have ready access to qualified professionals who can respond to the immediate and potential health needs of the children present at these sites.

Mecham, N., & Melini, J. (2002). Unintentional victims: development of a protocol for the care of children exposed to chemicals at methamphetamine laboratories. *Pediatric Emergency Care, 18*(4), 327-332.

Clinical toxicologic symptoms of methamphetamine exposure in children range from subtle agitation to seizure activity. In addition to the toxic concerns with methamphetamine production it-self, there are many social issues involved that potentially put children from these environments at risk. The binge-and-crash pattern of using this drug makes it difficult for parents who are users to meet even the basic needs of their children. Children are often not properly supervised. Meals may be forgotten for days at a time while the user is on a binge or in a crash. School problems, criminal behavior, and social isolation can develop for these children. Users of methamphetamine often become paranoid, frustrated, or can be hallucinatory. These behaviors can lead to violence against anyone who happens to be nearby; unfortunately, this is often the child in the home. While on a binge, the user can feel a heightened sexual drive. This can lead to sexual abuse, and children in the home are easy and convenient targets. This article describes the protocol developed by the Salt Lake City Police Department Methamphetamine Initiative in collaboration with the Center for Safe and Healthy Families and the State District Attorney's Office.

Anglin, M. D., Burke, C., Perrochet, B., Stamper, E., & Dawud-Noursi, S. (2000). History of the methamphetamine problem. *Journal of Psychoactive Drug, 32*(2), 137-141. DOI:10.1080/02791072.2000.10400221

Methamphetamine, called meth, crystal, or speed, is a central nervous system stimulant that can be injected, smoked, snorted, or ingested orally; prolonged use at high levels results in dependence. Methamphetamine (MA) is a derivative of amphetamine, which was widely prescribed in the 1950s and 1960s as a medication for depression and obesity, reaching a peak of 31 million prescriptions in the United States in 1967. Until the late 1980s, illicit use and manufacture of MA was endemic to California, but the MA user population has recently broadened in nature and in regional distribution, with increased use occurring in midwestern states. An estimated 4.7 mil-lion Americans (2.1% of the U.S. population) have tried MA at some time in their lives. Short- and long-term health effects of MA use include stroke, cardiac arrhythmia, stomach cramps, shaking, anxiety, insomnia, paranoia, hallucinations, and structural changes to the brain. Children of MA abusers are at risk of neglect and abuse, and the use of MA by pregnant women can cause growth retardation, premature birth, and developmental disorders in neonates and enduring cognitive deficits in children. MA-related deaths and admissions to hospital emergency rooms are increasing. Although inpatient hospitalization may be indicated to treat severe cases of long-term MA dependence, optimum treatment for MA abusers relies on an intensive outpatient setting with three to five visits per week of comprehensive counseling for at least the first three months. The burgeoning problems of increased MA use must be addressed by adequate treatment programs suitable for a variety of user types.

Stewart, J. L., & Meeker, J. E. (1997). Fetal and infant deaths associated with maternal methamphetamine abuse. *Journal of Analytical Toxicology, 21*(6), 515-517. DOI:10.1093/jat/21.6.515

Eight cases of fetal and infant death related to maternal methamphetamine abuse are presented. The mean fetal blood concentration of methamphetamine was 0.36 microgram/mL

(range, 0.03-1.20 micrograms/mL), and the mean concentration of amphetamine was 0.05 micro-gram/mL (range, 0-0.08 microgram/mL). Both maternal and fetal blood methamphetamine concentrations were obtained in two cases. The maternal and fetal methamphetamine concentrations for these two cases were 0.21 and 0.40 micro-gram/mL and 0.18 and 1.20 micrograms/mL, respectively. The cause of death for each case, as listed by the pathologist, is also discussed.

Gospe, S. M., Jr. (1995). Transient cortical blindness in an infant exposed to methamphetamine. *Annals of Emergency Medicine, 26*(3), 380-382.

An 11-month-old boy was brought to the pediatric emergency department for evaluation of acute onset of irritability and involuntary side-to-side turning of the head. Neurologic examination revealed cortical blindness. Toxicologic studies of blood and urine were positive for methamphetamine. The infant's vision and activity returned to normal within 12 hours. The possible mechanisms of this unusual form of amphetamine toxicity are discussed.