

## PERINATAL AND FAMILY SERVICES

### Pregnancy/Prenatal Exposure/Perinatal Services

Beblo, S., K. D. Stark, et al. (2005). "Effects of alcohol intake during pregnancy on docosahexaenoic acid and arachidonic acid in umbilical cord vessels of black women." Pediatrics **115**(2): E194-E203.

**OBJECTIVE:** Alcohol influences the intake and metabolism of several nutrients including long-chain polyunsaturated fatty acids (LC-PUFAs). The LC-PUFAs docosahexaenoic acid (DHA) and arachidonic acid (AA) are particularly crucial for intrauterine growth and brain development. We hypothesized that alcohol consumption adversely affects LC-PUFA levels in pregnant women and their newborn infants. **METHODS:** Pregnant black women (N = 208) presenting at a core city antenatal clinic were screened and recruited. Shortly before delivery, maternal plasma was collected. After delivery, umbilical arteries and veins were dissected from the cords, total lipids were extracted from the vessel tissues and maternal plasma, and fatty acid levels were assayed by gas chromatography. For statistical analysis, subjects were categorized according to absolute alcohol intake per day (AAD) and absolute alcohol intake per drinking day (AADD) around the time of conception, with smoking and other potential confounders included in the analyses. **RESULTS:** Significant differences in fatty acid composition of total lipid extracts were detected in umbilical cord vessels among the AADD groups: abstainers (AADD = 0), moderate drinkers (AADD < 130 g), and heavy drinkers (AADD > or = 130 g). DHA and AA content in the arterial umbilical vessel wall was approximately 14% and approximately 10% higher in the moderate (n = 127) and heavy (n = 32) alcohol groups, respectively, than in abstainers (n = 49). A small, nonsignificant increase (approximately 3%) was seen in the umbilical vein for AA but not for DHA. Alcohol intake was positively correlated to both DHA and AA concentrations in the arterial vessel wall but to neither in the venous wall nor maternal plasma. Maternal plasma DHA was positively correlated with both umbilical arteries and vein DHA, but there were no significant correlations for AA between maternal plasma and either umbilical vessel. **CONCLUSIONS:** Our findings indicate that alcohol intake during pregnancy is associated with altered DHA and AA status in fetal tissues. Although differences may be due to either metabolism and/or distribution, it is most likely a result of a direct influence of alcohol on fetal metabolism.

Behnke, M., F. D. Eyer, et al. (2005). "Outcome from a Prospective, Longitudinal Study of Prenatal Cocaine Use: Preschool Development at 3 Years of Age." J Pediatr Psychol.

**Objective:** To determine the effects of prenatal cocaine exposure on child development. **Methods** This prospective, longitudinal study recruited 154 pregnant cocaine users who were matched on race, parity, socioeconomic status, and perinatal risk to 154 noncocaine users. Drug use status was determined by maternal history and urine screening. At 3 years of age, the child subjects were assessed by an evaluator blinded to maternal drug use history. During a home visit at age 3, caregiver, family, and home assessments were administered. **Results** Structural equation modeling showed a direct effect of the amount of prenatal cocaine exposure on the adjusted birth head circumference which in turn directly affected preschool development. **Conclusions** We could not demonstrate a direct effect of prenatal cocaine exposure on preschool development, a result that is consistent with that of earlier work and now extending findings to age 3. However, cocaine continued to exert an indirect effect on development through its direct effect on the head circumference at birth.

Burden, M. J., S. W. Jacobson, et al. (2005). "Effects of prenatal alcohol exposure on attention and working memory at 7.5 years of age." Alcohol Clin Exp Res **29**(3): 443-52.

**BACKGROUND:** A broad range of attentional and neuropsychological impairments have been demonstrated in children with fetal alcohol exposure. This study was designed to investigate which specific aspects of attentional function are most directly affected by moderate to heavy doses of prenatal alcohol exposure. **METHODS:** A total of 337 black children who were aged 7.5 years and recruited prospectively to over represent prenatal alcohol exposure at moderate to heavy levels were assessed on a diverse battery of neuropsychological tests. Principal components analyses were used to replicate and extend Mirsky et al.'s (1991) four-component model of attention. The relation of prenatal alcohol exposure to empirically derived attentional constructs was examined. **RESULTS:** Both the replicated and the extended attentional models produced solutions similar to the original Mirsky et al. model, reflecting elements of encode (working memory), shift, and focused and sustained attention, as well as a distinct component reflecting impulsivity. Adverse effects of maternal drinking across pregnancy were found primarily for working memory, and these effects were exacerbated when mothers were aged 30 or older at the time of the child's birth. **CONCLUSIONS:** These data confirm previous studies using diverse methods that suggest that working memory may be the most important aspect of attention that is adversely affected by prenatal alcohol exposure.

Chang, G., T. K. McNamara, et al. (2005). "Brief intervention for prenatal alcohol use: A randomized trial." Obstetrics and Gynecology **105**(5): 991-998.

**OBJECTIVE:** To test the effectiveness of a brief intervention in the reduction of prenatal alcohol consumption by women when a partner is included. **METHODS:** Randomized trial of a single session brief intervention given by the study nurse or principal investigator for 304 pregnant women and their partners. The women had positive T-ACE (Tolerance, Annoyed, Cut down, Eye-opener, an alcohol screening test) results and were at risk for alcohol consumption while pregnant. All completed initial diagnostic and postpartum interviews. **RESULTS:** Fewer than 20% of participants (median 11.5 weeks of gestation) were abstinent at study enrollment, averaging more than 1.5 drinks per episode. Nearly 30% had 2 or more drinks at a time while pregnant. Prenatal alcohol use declined in both the treatment and control groups after study enrollment, based on a 95% follow-up rate. Factors associated with increased prenatal alcohol use after randomization included more years of education, extent of previous alcohol consumption, and temptation to drink in social situations. Brief interventions for prenatal alcohol reduced subsequent consumption most significantly for the women with the highest consumption initially (regression coefficient,  $b = -0.163$ , standard error ( $b$ ) = 0.063,  $P < .01$ ). Moreover, the effects of the brief intervention were significantly enhanced when a partner participated ( $b = -0.932$ , standard error ( $b$ ) = 0.468),  $P < .05$ ). **CONCLUSION:** Pregnant women with the highest levels of alcohol use reduced their drinking most after a brief intervention that included their partners. Recommendations include consistent screening for prenatal alcohol use followed by diagnostic assessment when indicated, and if confirmed by other studies, a patient-partner brief intervention for the heaviest drinkers. **LEVEL OF EVIDENCE:** I.

Chen, W. J. A. and L. K. Harle (2005). "Interactive effect of alcohol and nicotine on developing cerebellum: An investigation of the temporal pattern of alcohol and nicotine administration." Alcoholism-Clinical and Experimental Research **29**(3): 437-442.

**BACKGROUND:** Among individuals who use alcohol and tobacco products, pregnant women represent a unique subpopulation that generates a greater concern because of the toxic effects of alcohol and nicotine (from cigarettes and tobacco products) on the health of both the pregnant woman and her fetus. Therefore, it is imperative to understand the interactive effects of these two substances on the fetus. Previously, we found that concurrent exposure to alcohol and nicotine did not result in the loss of

greater numbers of Purkinje cells compared with each drug treatment alone, possibly as a result of a nicotine-mediated decline in peak blood alcohol concentration (BAC). The present study tested the validity of this hypothesis. **METHODS:** On postnatal day (PD) 4, Sprague-Dawley rat pups were assigned to five groups, GC (no alcohol [ALC], no nicotine [NIC]), ALC (4 g/kg/day), NIC (6 mg/kg/day), ALC/NIC (ALC and NIC given concurrently), or ALC-NIC (NIC administered 6 hr after ALC exposure). These rat pups were reared in an artificial-rearing apparatus from PDs 4 to 9, and the cerebellar tissues were obtained on PD 10. The total number of cerebellar Purkinje cells in the vermis was estimated using stereological methods. **RESULTS:** The results showed that alcohol significantly reduced Purkinje cell numbers. The coexposure of alcohol and nicotine did not lead to further reduction in Purkinje cell number regardless of administration method, concurrent or sequential. However, alcohol and nicotine administered concurrently but not sequentially significantly lowered the BAC. **CONCLUSION:** These findings suggest that the lack of increased Purkinje cell loss after the coexposure of alcohol and nicotine is independent of nicotine's ability to lower the BAC. An alternative hypothesis might be that alcohol and nicotine target the same subpopulation of Purkinje cells; therefore, no additional Purkinje cells were lost from the coexposure of these two drugs.

Feng, Q. (2005). "Postnatal consequences of prenatal cocaine exposure and myocardial apoptosis: does cocaine in utero imperil the adult heart?" Br J Pharmacol **144**(7): 887-8. Cocaine use is common among pregnant women with a history of substance abuse, and has been shown to cause abnormalities in the heart during fetal and postnatal development. However, mechanisms underlying the detrimental effects of cocaine on the developing heart are not fully understood. In this issue, Bae and Zhang show that prenatal cocaine exposure increases the susceptibility of the postnatal heart to ischemia and reperfusion injury. Their results suggest that myocardial apoptosis induced by cocaine during fetal development may represent one of the mechanisms by which prenatal cocaine exposure exerts its long-term, deleterious consequences on postnatal cardiac function.

Gauthier, T. W., C. Drews-Botsch, et al. (2005). "Maternal alcohol abuse and neonatal infection." Alcoholism-Clinical and Experimental Research **29**(6): 1035-1043.

**Background:** Since chronic alcohol use suppresses the adult immune system, we tested the hypothesis that maternal alcohol ingestion increases the risk of infection in term newborns.\* **Methods:** Analysis of a large case-control study of birth weight for gestational age was performed focusing on maternal alcohol ingestion and the development of infection in term newborns  $\geq$  36 weeks gestation. After delivery, mothers were asked about alcohol and tobacco use in the 3 months prior to conception, the 1(st), 2(nd), and 3(rd) trimester of pregnancy. **Results:** Eight hundred and seventy-two singleton newborns (872) 36 weeks gestation were identified for analysis. A total of 51 (5.8%) had newborn infections. Gestational age, sex, and small for gestational age (SGA) were similar in the newborns with and without infection ( $p = \text{NS}$ ). Infants whose mothers reported alcohol use, excessive drinking or smoking in pregnancy were more likely to have a newborn diagnosed with an infection than were mothers who reported abstaining from alcohol or cigarettes ( $p < 0.05$ ). When controlling for race and smoking, SGA infants whose mothers used any alcohol had a 2.5-fold increase risk of infection, while excessive alcohol use increased the risk 3-4-fold. In a multivariable logistic regression analysis controlling for low maternal income, smoking, and SGA, excessive alcohol use during the 2(nd) trimester increased the risk of newborn infection (OR 3.7 [1.1,12.8],  $p < 0.05$ ). **Conclusions:** Excessive maternal alcohol use is associated with an increased risk of newborn infection in this patient sample. Increased awareness and further clinical investigations are warranted to address the detrimental effects of fetal alcohol exposure on the developing immune system. **Key Words:** Fetal Alcohol, Infection, Newborn.

Grant, T. M., C. C. Ernst, et al. (2005). "Preventing Alcohol and Drug Exposed Births in Washington State: Intervention Findings From Three Parent-Child Assistance Program Sites." The American Journal of Drug and Alcohol Abuse **31**(3): 471.

Home visitation interventions show promise for helping at-risk mothers, yet few programs have been developed and evaluated specifically for alcohol and drug-abusing pregnant women. This study examines outcomes among 216 women enrolled in the Washington State Parent-Child Assistance Program, a three-year intervention program for women who abuse alcohol and drugs during an index pregnancy. Pretest-posttest comparison was made across three sites: the original demonstration (1991-1995), and the Seattle and Tacoma replications (1996-2003). In the original demonstration, the client group performed significantly better than controls. Compared to the original demonstration, outcomes at replication sites were maintained (for regular use of contraception and use of reliable method; and number of subsequent deliveries), or improved (for alcohol/drug treatment completed; alcohol/drug abstinence; subsequent delivery unexposed to alcohol/drugs). Improved outcomes at replication sites are not attributable to enrolling lower-risk women. Public policies and programs initiated over the study period may have had a positive effect on outcomes. Study findings suggest that this community-based intervention model is effective over time and across venues.

Harville, E. W., I. Hertz-Picciotto, et al. (2005). "Factors influencing the difference between maternal and cord blood lead." Occupational and Environmental Medicine **62**(4): 263-269.

Aims: To determine the factors that affect why some infants receive higher exposures relative to the mother's body burden than do others. Methods: A total of 159 mother-infant pairs from a cohort of women receiving prenatal care at Magee-Womens Hospital in Pittsburgh, PA from 1992 to 1995 provided blood samples at delivery for lead determination. The difference between cord and maternal blood lead concentration (PbB) and a dichotomous variable indicator of higher cord than maternal PbB, were examined as indicators of relative transfer. Women were interviewed twice during the pregnancy about lifestyle, medical history, calcium nutrition, and physical activity. Results: Higher blood pressure was associated with relatively greater cord compared with maternal PbB, as was maternal alcohol use. Sickle cell trait and higher haemoglobin were associated with a lower cord relative to maternal blood lead PbB. No association was seen with smoking, physical exertion, or calcium consumption. Conclusion: While reduction in maternal exposure will reduce fetal exposure, it may also be possible to mitigate infant lead exposure by reducing transfer from the pregnant woman. Interventions aimed at reducing blood pressure and alcohol consumption during pregnancy may be useful in this regard.

Hepper, P. G., J. C. Dornan, et al. (2005). "Maternal alcohol consumption during pregnancy may delay the development of spontaneous fetal startle behaviour." Physiology & Behavior **83**(5): 711-714.

Maternal alcohol consumption during pregnancy may delay the development of spontaneous fetal startle behaviour. Previous study indicated that fetuses exposed to alcohol exhibited a significantly higher incidence of spontaneous startles compared to fetuses not exposed at 20 weeks gestation. This study examined startle behaviour longitudinally from 20 to 35 weeks gestation to determine whether the previous results were due to 'developmental delay' or a 'permanent effect'. The number of spontaneous startles exhibited by fetuses of mothers who drank during pregnancy and fetuses whose mothers did not drink was recorded at 20, 25, 30 and 35 weeks gestation during a 45-min observation. The results indicate that exposure to alcohol during pregnancy significantly increases the exhibition of spontaneous startles by the fetus but across gestation there is significant catch-up in startle behaviour. The results suggest exposure to alcohol delays the natural maturation of spontaneous startle behaviour of the fetus but

also has a smaller 'permanent' effect. It is suggested that these effects are mediated by alcohol exerting an effect on the inhibitory pathways controlling startle behaviour.

Hurd, Y. L., X. Wang, et al. (2005). "Marijuana impairs growth in mid-gestation fetuses." Neurotoxicology and Teratology **27**(2): 221-229.

Marijuana (*Cannabis sativa*) is the most commonly used illicit drug by pregnant women, but information is limited about the effects of prenatal cannabis exposure on fetal development. The present study evaluated the influence of early maternal marijuana use on fetal growth. Women electing voluntary saline-induced abortions were recruited at a mid-gestational stage of pregnancy (weeks 17-22), and detailed drug use and medical histories were obtained. Toxicological assays (maternal urine and fetal meconium) were used in conjunction with the maternal report to assign groups. Subjects with documented cocaine and opiate use were excluded. Main developmental outcome variables were fetal weight, foot length, body length, and head circumference; ponderal index was also examined. Analyses were adjusted for maternal alcohol and cigarette use. Marijuana (n=44)- and nonmarijuana (n=95)-exposed fetuses had similar rates of growth with increased age. However, there was a 0.08-cm (95% CI -0.15 to -0.01) and 14.53-g (95% CI -28.21 to 0.86) significant reduction of foot length and body weight, respectively, for marijuana-exposed fetuses. Moreover, fetal foot length development was negatively correlated with the amount and frequency of marijuana use reported by the mothers. These findings provide evidence of a negative impact of prenatal marijuana exposure on the mid-gestational fetal growth even when adjusting for maternal use of other substances well known to impair fetal development.

Ikossi, D. G., A. A. Lazar, et al. (2005). "Profile of mothers at risk: An analysis of injury and pregnancy loss in 1,195 trauma patients." Journal of the American College of Surgeons **200**(1): 49-56.

**BACKGROUND:** Trauma is the number one cause of maternal death during pregnancy, but incidence of fetal loss exceeds maternal loss by more than 3 to 1. We hypothesized that we could identify women at risk for injury during pregnancy and focus our prevention efforts. **STUDY DESIGN:** Women of childbearing age in the American College of Surgeon's National Trauma Data Bank served as the study population. Pregnant patients were compared with nonpregnant patients with respect to age, race, mechanism of injury, injury patterns and severity, risk-taking behaviors, and outcomes. Multivariate logistic regression analysis was used to identify risk factors for loss of pregnancy in mothers who survived their trauma. **RESULTS:** Pregnant trauma patients (n = 1,195) were younger, less severely injured, and more likely to be African American or Hispanic as compared with the nonpregnant cohort (n = 76,126). Twenty percent of injured pregnant patients tested positive for drugs or alcohol, and approximately one-third of those involved in motor vehicle crashes were not using seatbelts. Independent risk factors for fetal loss after trauma included Injury Severity Score > 15; Adjusted Injury Score > or = 3 in the head, abdomen, thorax, or lower extremities; and Glasgow Coma Score < or = 8. **CONCLUSIONS:** Young, African-American, and Hispanic pregnant women are at higher risk for trauma in pregnancy and are most likely to benefit from primary trauma prevention efforts. Those with severe head, abdominal, thoracic, or lower extremity injuries are at high risk for pregnancy loss. Reduction of secondary insults and early recognition of fetal distress may improve outcomes for both the mother and fetus in this high-risk group.

Jacqz-Aigrain, E. and G. Koren (2005). "Effects of drugs on the fetus." Semin Fetal Neonatal Med **10**(2): 139-47.

Most drugs are not labelled for use in pregnancy. Consequently, large numbers of women expose their fetus to potential risks, either because they do not know that they are pregnant or because they require treatment for gestational pathologies. The present

review focuses on drug classes for which the risk:benefit ratio during pregnancy has been discussed recently based on human data. Selective serotonin reuptake inhibitors have gained wide acceptance in the treatment of depression and data on their risk for neonatal adaptation after late exposure are reviewed. Angiotensin converting enzyme inhibitors and angiotensin II receptors antagonists interact with the renin-angiotensin system, although with different mechanisms, and might cause severe fetal tubular dysgenesis. Non-steroidal anti-inflammatory and antiviral drugs and recreational drugs are also presented.

Jansson, L. M., J. DiPietro, et al. (2005). "Fetal response to maternal methadone administration." American Journal of Obstetrics and Gynecology **193**(3): 611-617.

**Objective:** The purpose of this study was to investigate the effect of methadone on fetal neurobehavioral functions and maternal physiologic indicators. **Study design:** Forty women attending a substance abuse treatment facility with otherwise uncomplicated pregnancies were evaluated at peak and trough methadone levels. Fetal measures included heart rate, variability, periodic accelerations/decelerations, motor activity, and fetal movement-heart rate coupling. Maternal measures included maternal heart period, variability, electrodermal skin conductance, respiration, and respiratory sinus arrhythmia (RSA). Repeated measure analysis of variance was used to evaluate within-subject changes. **Results:** At peak methadone, fetal heart rate was slower, less variable, and displayed fewer accelerations. Fetuses displayed less motor activity, and the integration between heart rate and motor activity was attenuated. Maternal heart rate and skin conductance were unchanged, but methadone administration was associated with lower respiratory rate and RSA, an indicator of parasympathetic tone. **Conclusion:** Maternal methadone administration has significant effects on fetal behavioral functions that are independent of maternal effects.

Kennedy, C., N. Finkelstein, et al. (2004). "Improving screening for alcohol use during pregnancy: The Massachusetts ASAP program." Maternal and Child Health Journal **8**(3): 137-147.

**OBJECTIVE:** To motivate prenatal care staff in public and private settings to universally screen for risk of alcohol and drug use and to conduct a brief intervention with follow-up referral when appropriate during a routine office visit. **METHODS:** The ASAP Project methods were engagement of site staff; staff training; self-administered questionnaires embedded with a relational and broad catch screening tool; a brief intervention protocol; unique clinical decision tree/protocols for each site; identification of treatment and referral resources; and ongoing technical assistance and consultation. Sites were located in four regions of the state and included four community health centers, a network of multi-specialty private practices and a teaching hospital. **RESULTS:** Across 16 sites, 118 prenatal staff were trained on use of the screening tool and 175 staff on the brief intervention. The ASAP Project resulted in 95% of pregnant women being screened for alcohol use and 77% of those screening positive for at least one risk factor receiving a brief intervention during a routine office visit. **CONCLUSIONS:** Screening and brief interventions for alcohol use can be delivered effectively within a routine prenatal care visit by prenatal staff by utilizing and building on existing office systems with practice staff, screening for any use not only at risk use, providing training with skills building sessions and information delivered by physicians, offering easy-to-access community treatment resources, and providing ongoing technical assistance.

Little, M., R. Shah, et al. (2005). "Adverse perinatal outcomes associated with homelessness and substance use in pregnancy." Cmaj **173**(6): 615-8. **[not U.S based population, but findings may be of use]**

**BACKGROUND:** Women who are homeless during pregnancy may be exposed to poor nutrition, violence and substance use, yet the health status of their newborn infants has

not been systematically evaluated. We undertook a study to provide preliminary estimates of the risk of adverse perinatal outcomes among Canadian women who are homeless or marginally housed during pregnancy, and the effect of concomitant substance use. METHODS: We conducted a retrospective cohort study at a single downtown hospital from October 2002 to December 2004, involving women who, during pregnancy, were homeless or underhoused (n = 80), substance users (n = 59) or neither (n = 3756). We noted neonatal measures such as birth weight and gestational age; the main study outcomes were preterm birth before 37 weeks' gestation, birth weight less than 2000 g and small for gestational age at birth. RESULTS: Homelessness or inadequate housing was associated with an odds ratio (adjusted for maternal age, gravidity and being a current smoker of tobacco) of 2.9 (95% confidence interval [CI] 1.4-6.1) for preterm delivery, 6.9 (95% CI 2.4-20.0) for infant birth weight under 2000 g and 3.3 (95% CI 1.1-10.3) for delivery of a newborn small for gestational age. Adjusted odds ratios for substance use during pregnancy were similar. In the combined presence of an underhoused or homeless state and maternal substance use, the adjusted risk estimates were 5.9 (95% CI 1.9-18.5), 16.6 (95% CI 3.5-79.3) and 5.6 (95% CI 1.1-28.7), respectively. INTERPRETATION: Homelessness and maternal substance use may reduce neonatal well-being through prematurity and low birth weight.

Ludlow, J. P., S. E. Evans, et al. (2005). "Obstetric and perinatal outcomes in pregnancies associated with illicit substance abuse." Australian & New Zealand Journal of Obstetrics & Gynaecology 44(4): 302-306. **[not U.S based population, but finding may be of use]**

Objective: To determine the obstetric and perinatal outcomes of women using illicit drugs during pregnancy by substance group. Method: A retrospective audit of obstetric and perinatal outcomes in women who used opiates or amphetamines during their pregnancy and delivered at King Edward Memorial Hospital (KEMH), Perth, Australia between December 1997 and April 2000 was performed. Maternal, fetal and neonatal parameters were assessed. These were compared with obstetric and perinatal data recorded by the Health Department of Western Australia (HDWA) for the 25 291 deliveries of 25 677 infants in 1998. Results: Between December 1997 and April 2000 91 opiate-using and 50 amphetamine-using women were identified and included in the analysis. Both groups of drug-using women were younger (opiates P = 0.001, amphetamines P = 0.001) than the general population. There was a higher incidence of aboriginality (P = 0.001) in the amphetamine group. In the opiate-using group multiparity (P = 0.0001) and anaemia (P = 0.0001) were higher. Illicit drug-using women had a higher incidence of hepatitis C (opiates P = 0.001, amphetamines P = 0.003), and a greater need for pharmacological analgesia for labour and delivery (opiates P = 0.007, amphetamines P = 0.042). Their infants were significantly more likely to deliver at less than 37 weeks' gestation (opiates P = 0.0001, amphetamines P = 0.001), to have a birthweight of less than 2.5 kg (P = 0.0001), be small for gestational age and require admission to the special care nursery (P = 0.0001). Infants born to women in the amphetamine group were more likely to have an Apgar score < 7 (P = 0.0001) recorded. Infants of women in the opiate group required more resuscitation (P = 0.05). Conclusion: Women who use illicit drugs are more likely to experience adverse obstetric and perinatal outcomes than women in the general population. Differences are seen depending on the type of illicit drug used. These findings need to be replicated in a larger prospective cohort to highlight management requirements of these women and their infants. Further information is required about the effects of amphetamines in pregnancy.

Medina, A. E., T. E. Krahe, et al. (2005). "Early alcohol exposure induces persistent alteration of cortical columnar organization and reduced orientation selectivity in the visual cortex." J Neurophysiol 93(3): 1317-25.

Fetal alcohol syndrome (FAS) is a major cause of learning and sensory deficits in

children. The visual system in particular is markedly affected, with an elevated prevalence of poor visual perceptual skills. Developmental problems involving the neocortex are likely to make a major contribution to some of these abnormalities. Neuronal selectivity to stimulus orientation, a functional property thought to be crucial for normal vision, may be especially vulnerable to alcohol exposure because it starts developing even before eye opening. To address this issue, we examined the effects of early alcohol exposure on development of cortical neuron orientation selectivity and organization of cortical orientation columns. Ferrets were exposed to ethanol starting at postnatal day (P) 10, when the functional properties and connectivity of neocortical neurons start to develop. Alcohol exposure ended at P30, just before eye opening at P32. Following a prolonged alcohol-free period (15-35 days), long-term effects of early alcohol exposure on cortical orientation selectivity were examined at P48-P65, when orientation selectivity in normal ferret cortex has reached a mature state. Optical imaging of intrinsic signals revealed decreased contrast of orientation maps in alcohol- but not saline-treated animals. Moreover, single-unit recordings revealed that early alcohol treatment weakened neuronal orientation selectivity while preserving robust visual responses. These findings indicate that alcohol exposure during a brief period of development disrupts cortical processing of sensory information at a later age and suggest a neurobiological substrate for some types of sensory deficits in FAS.

Mennella, J. A., M. Y. Pepino, et al. (2005). "Acute alcohol consumption disrupts the hormonal milieu of lactating women." Journal of Clinical Endocrinology and Metabolism **90**(4): 1979-1985.

Despite the lack of scientific evidence to support the claim that alcohol is a galactagogue, lactating women have been advised to drink alcohol as an aid to lactation for centuries. To test the hypothesis that alcohol consumption affects the hormonal response in lactating women, we conducted a within-subjects design study in which 17 women consumed a 0.4 g/kg dose of alcohol in orange juice during one test session and an equal volume of orange juice during the other. Changes in plasma prolactin, oxytocin, and cortisol levels during and after breast stimulation, lactational performance, and mood states were compared under the two experimental conditions. Oxytocin levels significantly decreased, whereas prolactin levels and measures of sedation, dysphoria, and drunkenness significantly increased, during the immediate hours after alcohol consumption. Changes in oxytocin were related to measures of lactational performance such as milk yield and ejection latencies, whereas changes in prolactin were related to self-reported measures of drunkenness. Although alcohol consumption resulted in significantly higher cortisol when compared with the control condition, cortisol levels were not significantly correlated with any of the indices of lactational performance or self-reported drug effects. Moreover, cortisol levels steadily decreased on the control day, indicating that the procedures were not stressful to the subjects. In conclusion, recommending alcohol as an aid to lactation may be counterproductive. In the short term, mothers may be more relaxed, but the hormonal milieu underlying lactational performance is disrupted, and, in turn, the infant's milk supply is diminished.

Miller-Loncar, C., B. M. Lester, et al. (2005). "Predictors of motor development in children prenatally exposed to cocaine." Neurotoxicol Teratol **27**(2): 213-20.

The current study examined the pattern of motor development across the first 18 months of life in infants with in utero exposure to cocaine to determine how prenatal drug effects and level of exposure relates to motor development. Motor development was examined at 1, 4, 12, and 18 months of age (corrected for prematurity). Infants were divided into cocaine exposed (n=392) and comparison (n=776) groups. Exposure status was determined by meconium assay and maternal self-report with alcohol, marijuana, tobacco, and opiates present in both groups. Motor skills were assessed at 1 month using the NICU Network Neurobehavioral Scale (NNNS), at 4 months using the posture and fine motor assessment of infants (PFMAI), at 12 months using the Bayley Scales of

Infant Development-Second Edition (BSID-II), and at 18 months using the Peabody Developmental Motor Scales (PDMS). Examiners masked to exposure status performed all assessments. Motor scores were converted to standard (z) scores, and hierarchical linear modeling (HLM) was used to examine the change in motor skills from 1 to 18 months of age. Infants with exposure to cocaine showed low motor skills at their initial status of 1 month but displayed significant increases over time. Both higher and lower levels of tobacco use related to poorer motor performance on average. Heavy cocaine use related to poorer motor performance as compared to no use, but there were no effects of level of cocaine use on change in motor skills.

Minnes, S., L. T. Singer, et al. (2005). "Effects of Prenatal Cocaine/Polydrug Use on Maternal-Infant Feeding Interactions During the First Year of Life." Journal of Developmental and Behavioral Pediatrics **26**(3): 194.

The effects of prenatal cocaine use on quality of maternal-infant interactions were evaluated using the Nursing Child Assessment Feeding Scale (NCAFS). A total of 341 (155 cocaine using; 186 non-cocaine using) low socioeconomic, primarily African-American dyads were evaluated longitudinally at birth, 6.5, and 12 months. Group differences over time were examined, controlling for covariates, using a mixed-model linear approach. Women who used cocaine during pregnancy were less sensitive to their infants than non-cocaine-using women at 6.5 and 12 months. At 6.5 months, heavier prenatal cocaine users were less responsive to their infants than lighter users. In infants, prenatal cocaine exposure was related to poorer clarity of cues. There were no significant cocaine effects on maternal social-emotional growth fostering, cognitive growth fostering, or infant responsiveness to mother. Controlling for covariates, concentration of cocaine metabolites predicted maternal sensitivity to infant cues and infant clarity of cues at 1 year. Maternal cocaine use during pregnancy and other pre- and postnatal factors adversely affect maternal-infant interactions during the first year of life.

Noland, J. S., L. I. Singer, et al. (2005). "Prenatal drug exposure and selective attention in preschoolers." Neurotoxicology and Teratology **27**(3): 429-438.

Deficits in sustained attention and impulsivity have previously been demonstrated in preschoolers prenatally exposed to cocaine. We assessed an additional component of attention, selective attention, in a large, poly-substance cocaine-exposed cohort of 4 year olds and their at-risk comparison group. Employing postpartum maternal report and biological assay, we assigned children to overlapping exposed and complementary control groups for maternal use of cocaine, alcohol, marijuana, and cigarettes. Maternal pregnancy use of cocaine and use of cigarettes were both associated with increased commission errors, indicative of inferior selective attention. Severity of maternal use of marijuana during pregnancy was positively correlated with omission errors, suggesting impaired sustained attention. Substance exposure effects were independent of maternal postpartum psychological distress, birth mother cognitive functioning, current caregiver functioning, other substance exposures and child concurrent verbal IQ.

Okah, F. A., J. Cai, et al. (2005). "Term-gestation low birth weight and health-compromising behaviors during pregnancy." Obstet Gynecol **105**(3): 543-50.

OBJECTIVE: To estimate the association between term-gestation low birth weight (term-LBW) rates and increasing numbers of health-compromising behaviors during pregnancy. METHODS: Retrospective cohort study of 78,397 term live births in Kansas City, Missouri, 1990-2002. Information on maternal and newborn characteristics was obtained from birth certificate records. Health-compromising behavior, specifically, smoking, alcohol, and drug use, was classified by the numbers and combinations of behaviors engaged in during pregnancy. Covariates included race, age, interconception interval, education, Medicaid status, medical risk factors, adequacy of prenatal care, and

marital status. RESULTS: The cohort was 61% white, 16% less than 20 years of age, 45% on Medicaid, 24% with medical risk factor, and 45% single pregnant women. Overall term-LBW rate was 3.3%, and it increased with numbers of health-compromising behaviors: 2.6% (none), 5.5% (1), 10.8% (2), and 18.5% (3),  $P < .001$ . Unadjusted odds ratio (OR) for term-LBW increased with increasing numbers of behaviors (OR 1.0 [none]; 2.3, 95% confidence interval 2.0-2.4 [smoking]; 0.9, 0.6-1.4 [alcohol]; 2.1, 1.5-3.0 [drugs]; 4.6, 3.6-5.8 [smoking + alcohol]; 4.4, 3.6-5.4 [smoking + drugs]; 4.2, 1.5-11.9 [drugs + alcohol]; 8.4, 6.2-11.5 [smoking + alcohol + drugs]). However, on adjusting for covariates, smoking, alone (OR 2.3, 2.0-2.5) or in combinations with other behaviors (OR 4.4, 3.4-5.7 [smoking + alcohol]; 2.0, 1.6-2.6 [smoking + drugs]; and 3.3, 2.2-4.7 [smoking + alcohol + drugs]) remained the major risk factor for term-LBW. CONCLUSION: Smoking alone or in combination with alcohol and/or drug use is associated with term-LBW among women who engage in health-compromising behaviors. The effect is especially pronounced when smoking is combined with alcohol consumption.

Paul, M. E., C. J. Chantry, et al. (2005). "Morbidity and mortality during the first two years of life among uninfected children born to human immunodeficiency virus type 1-infected women: the women and infants transmission study." *Pediatr Infect Dis J* **24**(1): 46-56.

OBJECTIVE: We evaluated morbidity and mortality during the first 2 years of life among children born to human immunodeficiency virus-(HIV) type 1-infected women enrolled in the Women and Infants Transmission Study (WITS) during an 11-year period (1990-2001). DESIGN AND METHODS: As part of WITS, evaluations were performed at birth and at 1, 2, 4, 6, 9, 12, 18 and 24 months of age. Growth, hospitalization and the incidence of clinical disease were assessed regularly. RESULTS: Data regarding 1118 children born to HIV-infected women (955 HIV-uninfected children and 163 HIV-infected children) were analyzed. Fewer changes in the caretaker of the child and fewer in utero exposures to drugs, tobacco and alcohol occurred in the latter periods of the study (all  $P$  values for time trend analyses  $<0.01$ ). The percentages of HIV-uninfected children with poor weight gain (44 of 767; 5.7%), short stature (32 of 703; 4.5%) and wasting (27 of 792; 3.4%) were higher than expected for the general population. Two or more changes in caretaker were associated with all growth deficiencies except wasting, and fetal exposure to tobacco was associated with height abnormalities. Anemia was common and was associated with receipt of zidovudine prophylaxis. Morbidity and mortality decreased during the study period. For the uninfected children, a decrease in class A events (Kaplan-Meier rates: group 1, 22.3%; group 2, 6.8%; group 3, 4.2%;  $P < 0.001$ ) and class C events and death (Kaplan-Meier event rates: group 1, 2.0%; group 2, 1.7%; group 3, 0.2%;  $P = 0.062$ ) during the first 2 years of life account for the differences in the curves over time. CONCLUSIONS: During an 11-year period, morbidity and mortality during the first 24 months of life decreased substantially for children born to HIV-infected women.

Porath, A. J. and P. A. Fried (2005). "Effects of prenatal cigarette and marijuana exposure on drug use among offspring." *Neurotoxicol Teratol* **27**(2): 267-77.

The present study investigated whether maternal cigarette smoking and marijuana use during pregnancy were associated with an increased risk of initiation and daily/regular use of such substances among one hundred fifty-two 16- to 21-year-old adolescent offspring. The participants were from a low risk, predominately middle-class sample participating in an ongoing, longitudinal study. Findings indicated that offspring whose mothers reported smoking cigarettes during their pregnancy were more than twice as likely to have initiated cigarette smoking during adolescence than offspring of mothers who reported no smoking while pregnant. Offspring of mothers who reported using marijuana during pregnancy were at increased risk for both subsequent initiation of cigarette smoking (OR=2.58) and marijuana use (OR=2.76), as well as daily cigarette

smoking (OR=2.36), as compared to offspring of whose mothers did not report using marijuana while pregnant. There was also evidence indicating that dose-response relationships existed between prenatal exposure to marijuana and offspring's use of cigarettes and marijuana. These associations were found to be more pronounced for males than females, and remained after consideration of potential confounds. Such results suggest that maternal cigarette smoking and marijuana use during pregnancy are risk factors for later smoking and marijuana use among adolescent offspring, and add to the weight of evidence that can be used in support of programs aimed at drug use prevention and cessation among women during pregnancy.

Riley, E. P. and C. L. McGee (2005). "Fetal alcohol spectrum disorders: an overview with emphasis on changes in brain and behavior." Exp Biol Med (Maywood) **230**(6): 357-65.

Fetal alcohol spectrum disorders constitute a major public health problem. This article presents an overview of important issues that surround these disorders and emphasizes the structural and neurobehavioral consequences associated with prenatal exposure to alcohol. Diagnostic criteria are discussed, and possible moderating factors for the range of outcomes are mentioned. In addition, the prevalence of fetal alcohol spectrum disorders is described, and estimates of the financial impact of these disorders are given. Heavy prenatal alcohol exposure can severely affect the physical and neurobehavioral development of a child. Autopsy and brain imaging studies indicate reductions and abnormalities in overall brain size and shape, specifically in structures such as the cerebellum, basal ganglia, and corpus callosum. A wide range of neuropsychological deficits have been found in children prenatally exposed to alcohol, including deficits in visuospatial functioning, verbal and nonverbal learning, attention, and executive functioning. These children also exhibit a variety of behavioral problems that can further affect their daily functioning. Children exposed to alcohol prenatally, with and without the physical features of fetal alcohol syndrome, display qualitatively similar deficits. Determining the behavioral phenotypes that result from heavy prenatal alcohol exposure is critical, because the identification of these children is crucial for early interventions. In addition, knowing which brain areas are involved might enable the development of better intervention strategies. However, intervention needs to go beyond the affected individual to prevent future cases. As evidenced by the staggering financial impact these disorders have on society, prevention efforts need to be aimed at high-risk groups, and this issue needs to be made a high priority in terms of public health.

Rosado, J., S. C. Sigmon, et al. (2005). "Cash value of voucher reinforcers in pregnant drug-dependent women." Exp Clin Psychopharmacol **13**(1): 41-7.

This study examined the relative reinforcing potency of vouchers and cash in drug-dependent pregnant women (N = 48) across voucher values (US 10 dollars, US 50 dollars, and US 100 dollars) by use of a series of choices to understand how exchange-delay features of voucher reinforcers influence their reinforcing potency compared with cash. The study also examined a no delay vs. 2-day delay of the cash alternative. Generally, cash was selected at 80%-90% of voucher face values. Vouchers were also discounted less when a 2-day delay was imposed on the cash option compared to the immediately available cash. These results suggest that voucher discounting does occur among patients in drug treatment. However, vouchers retain 80%-90% of their cash value and thus remain relatively potent reinforcers.

Rayburn, W. F. and M. P. E Bogenschutz (2004). "Pharmacotherapy for pregnant women with addictions." American Journal of Obstetrics and Gynecology **191**(6): 1885-1897.

OBJECTIVE: Dependence on alcohol, nicotine, or illicit drugs during pregnancy continues to be a problem of major medical, social, and fetal consequences. The purpose of this systematic review was to summarize current experience that pertains to pharmacotherapy for pregnant women with specific chemical addictions. STUDY

DESIGN: Studies were identified through Medline and HealthSTAR (1979-2003) that linked specific pharmacotherapy with pregnancy. This article reviews the English language literature for clinical studies that link the 2 conditions. In addition, reference lists of all articles that were obtained were evaluated for other potential citations. RESULTS: Pregnant women are excluded systematically from almost all drug trials. Most knowledge about the fetal effects from maternal substance and medication use comes from animal data and from case reports and small clinical series. With the exception of methadone and nicotine replacement, clinical experience with antiaddictive medications in pregnant women is either very limited (alcohol, stimulants) or nonexistent (cannabis, hallucinogens). CONCLUSION: Antiaddiction medications are important in the treatment of pregnant women with opioid and nicotine dependence and are of growing importance in the treatment of alcohol and stimulant dependence. Future directions will be toward increasing knowledge about current drug therapy and in developing new antiaddiction medications

Schiller, C. and P. J. Allen (2005). "Follow-up of Infants Prenatally Exposed to Cocaine." Pediatric Nursing **31**(5): 427.

Maternal cocaine use during pregnancy continues to be of great concern for health care professionals. Research in this area has increased as investigators examine the effects of prenatal cocaine exposure in the infant/young child. This paper will critically review the literature, identify the primary care needs of infants and young children with a known history of prenatal cocaine exposure, and present guidelines for the primary care practitioner to monitor the infant's physiologic and developmental sequelae during the first 3 years of life. Findings in the literature demonstrate inconsistencies in regard to the physiologic and developmental outcomes of infants/young children prenatally exposed to cocaine. Further research is warranted, as it is evident from studies that not all investigators are controlling for confounding variables such as poly-drug use, which is necessary in isolating cocaine's effects. Subtle effects, however, have been reported from well-controlled studies and, thus, particular attention needs to be paid to early identification and interventions by primary care practitioners to prevent negative health outcomes. The guidelines proposed assist the practitioner with a thorough and focused approach to assessing the physiologic and developmental effects that are currently known to occur in the infant/young child prenatally exposed to cocaine.

Schoeman, J., D. V. Grove, et al. (2005). "Are domestic violence and the excessive use of alcohol risk factors for preterm birth?" J Trop Pediatr **51**(1): 49-50.

Violence has been associated with adverse pregnancy outcome, which led us to determine whether patients who deliver preterm, experience more domestic violence than those who deliver at term. Two groups of patients were assessed, a preterm labour group and a low-risk group. A total of 229 patients were interviewed: 99 in the low-risk (LR) group and 130 in the preterm labour (PTL) group. The PTL group experienced significantly more violence throughout their lives than the LR group. Experiences of violence within the last year or during the pregnancy were also higher for the PTL group. This group smoked significantly more cigarettes per day, used more alcohol, and had a higher incidence of syphilis than the LR group. Violence alone does not seem to cause PTL directly, but is part of a low socioeconomic lifestyle. The fact that alcohol-use is so high among these women needs to be addressed and the need for education on values and respect, family planning use, and low-risk sexual behaviour is once again challenged.

Simpson, M. E., S. Duggal, et al. (2005). "Prenatal ethanol exposure has differential effects on fetal growth and skeletal ossification." Bone **36**(3): 521-532.

There is increasing evidence suggesting that the intrauterine environment may influence long-term bone health and the risk of developing osteoporosis in later life. Alcohol

(ethanol) is one factor whose presence in the prenatal environment has long-term consequences for the offspring, including permanent growth retardation. Moreover, prenatal ethanol exposure retards both fetal and postnatal bone development. It is unknown if ethanol's effects on skeletal development result from generalized growth retardation or effects specific to skeletal development. Furthermore, the level of ethanol exposure required to produce skeletal effects is unknown. The objectives of this study were to determine (1) if ethanol exerts specific effects on fetal skeletal development that are independent from its effects on general growth, and (2) the level of prenatal ethanol exposure required to affect fetal growth and skeletal ossification. Rats were fed isocaloric diets with ethanol (15%, 25%, or 36% ethanol-derived calories (EDC), approximating low, moderate, and high exposure levels), or without ethanol (pair-fed, PF, or control, C groups), prior to and throughout 21 days of gestation. The degree of E-induced delay in development was determined by comparison of E fetuses on d21 gestation to C fetuses on d17-d21 gestation. Prenatal ethanol exposure at 36% EDC decreased fetal body weight, length, and skeletal ossification compared with PF and C fetuses on d21 gestation. Importantly, effects on ossification, but not body weight or length, were also seen at the more moderate dose of 25% EDC, and the number of bones affected and the severity of effects on ossification tended to increase with dose of ethanol. Comparison of E fetuses on d21 gestation with C fetuses from d17 to 21 gestation indicated that the ethanol-induced delay in development differed for weight and skeletal ossification, and was not uniform among skeletal sites. Taken together, these data suggest that prenatal ethanol exposure has effects on fetal skeletal development that are independent of those on overall fetal growth, and that these effects occur even at moderate levels of maternal drinking. Effects of prenatal ethanol exposure on fetal skeletal development could potentially increase the offspring's risk of osteoporosis later in life.

Stark, K. D., R. J. Pawlosky, et al. "Status of plasma folate after folic acid fortification of the food supply in pregnant African American women and the influences of diet; smoking; and alcohol consumption." The American Journal of Clinical Nutrition **81**(3): 669.

Background: African American women and socioeconomically challenged women are at risk of compromised folate status and, thus, of folate-related birth defects. Data are limited on circulating folate concentrations in pregnant African American women after folic acid fortification of the food supply was implemented. Objective: The objective was to determine the influence of smoking and alcohol consumption on plasma 5-methyltetrahydrofolic acid (5-MTHFA) concentrations in pregnant African American women. Design: Alcohol consumption, smoking exposure, and other characteristics of pregnant African American women reporting to an inner-city antenatal clinic were assessed. At 24 wk of gestation, blood samples and food-frequency intake data were collected. Plasma 5-MTHFA concentrations were determined by liquid chromatography-mass spectrometry for 116 subjects and examined in a correlational study design. Results: Dietary folate and markers of alcohol consumption were positively associated, whereas exposure to smoke was negatively associated with plasma 5-MTHFA. More than one-half of the participants in this population failed to meet the recommended dietary allowance for dietary folate equivalents of 600 &micro;g/d during pregnancy. Conclusions: Most inner-city African American women are not meeting the recommended dietary allowance for dietary folate during pregnancy, and smoking may further compromise their folate status. Programs to reduce smoking and raise awareness about the importance of folate and multivitamin supplementation during pregnancy need to target this population.

Twomey, J. E., R. Soave, et al. (2005). "Permanency planning and social service systems: A comparison of two families with prenatally substance exposed infants." Infant Mental Health Journal **26**(3): 250-267.

An innovative program developed to work with families in which substance use during pregnancy leads to Child Protective Services involvement is introduced in this article. The Vulnerable Infants Program of Rhode Island (VIP-RI) was established to facilitate permanency planning for substance-exposed infants by focusing on the interface of social service systems with one another and with the families affected by perinatal substance use. Permanent placement within the time frame mandated by federal legislation places increased pressures on parents and the social service systems designed to provide them with assistance. The Vulnerable Infants Program of Rhode Island promotes collaboration, coordination, and communication among social service systems engaged with families of substance-exposed infants. The Vulnerable Infants Program of Rhode Island works to increase the efficacy of social service systems in order to optimize the resources that are available to a family in their attempts at reunification with their infant. Case examples illustrate the complexities of the families of substance-exposed infants, the breadth of social service systems that become involved with these families, and the vastly different placement outcomes that substance-exposed infants may experience.

Uhlhorn, S. B., D. S. Messinger, et al. (2005). "Cocaine exposure and mother-toddler social play." Infant Behavior & Development **28**(1): 62-73.

This study compared the play interactions of 18-month-old cocaine-exposed toddlers and their mothers (n = 48) to non-cocaine-exposed comparison toddlers and their mothers (n = 77). Coders blind to drug-exposure status reliably coded the interactions for maternal directiveness, positivity, and sensitivity; child social initiative and positivity; and dyadic responsiveness. There were no cocaine exposure group differences on any of the measures, with or without statistical controls for birth weight, SES, maternal age, and prenatal exposure to alcohol, marijuana, and cigarettes. Irrespective of cocaine exposure, low birth weight was associated with fewer maternal positive vocalizations and lower levels of maternal sensitivity. In higher SES dyads, children were more likely to respond to mother requests. The absence of cocaine exposure differences in social interactive behaviors during mother-child play in a relatively large sample of mothers and their children, is discussed with respect to the existing literature.

Wang, X. Y., D. Dow-Edwards, et al. (2004). "In utero marijuana exposure associated with abnormal amygdala dopamine D-2 gene expression in the human fetus." Biological Psychiatry **56**(12): 909-915.

Background: (*Cannabis sativa*) is the illicit drug most used by pregnant women, and behavioral and cognitive impairments have been documented in cannabis-exposed offspring. Despite the extensive use of marijuana, very limited information exists as to the consequences of prenatal cannabis exposure on the developing human brain. Methods: We optimized an in situ hybridization histochemistry technique to visualize mRNA expression in midgestation (weeks 18-22) human fetal specimens from mothers with and without documented evidence of cannabis use during pregnancy. The cannabinoid receptor type I (CB1) and major dopamine receptor subtypes, D-1 and D-2, were examined in the striatum and mesocorticolimbic structures (amygdala and hippocampus). Results: Adjusting for various covariates, we found a specific reduction, particularly in male fetuses, of the D-2 mRNA expression levels in the amygdala basal nucleus in association with maternal marijuana use. The reduction was positively correlated with the amount of maternal marijuana intake during pregnancy. No significant cannabis-related alterations were detected in the hippocampus or caudal striatum for the D-2, D-1, and CB1 mRNA levels, although alcohol showed significant contribution to striatal D-1/D-2 expression. Conclusions: These human fetal findings suggest that in utero cannabis exposure may impair distinct mesocorticolimbic neural systems that regulate emotional behavior.

Wattendorf, D. J. and M. Muenke "Fetal Alcohol Spectrum Disorders." American Family Physician **72**(2): 279.

Fetal alcohol spectrum disorders (FASD) are caused by the effects of maternal alcohol consumption during pregnancy. Fetal alcohol syndrome is the most clinically recognizable form of FASD and is characterized by a pattern of minor facial anomalies, prenatal and postnatal growth retardation, and functional or structural central nervous system abnormalities. Wattendorf and Muenke offers a detailed discussion of the disorder.

### **Children's Services/COSAs**

Belcher, H. M. E., A. M. Butz, et al. (2005). "Spectrum of early intervention services for children with intrauterine drug exposure." Infants and Young Children **18**(1): 2-15.

Intrauterine illicit drug exposure may lead to a variety of adverse neurobehavioral and neurodevelopmental outcomes. Providing early intervention to reduce the impact of maternal substance abuse on the developing fetus may have significant benefits for the child and family. In this article, we report on 3 promising intervention programs designed to improve the well-being of parents with drug dependence and their children. The initiation of these programs spans from pregnancy through early childhood. All 3 programs are community-based, using comprehensive culturally relevant developmental models. The first program was developed to provide comprehensive care for pregnant women with drug dependence and their newborns. Project STRIVE (Support, Trust, Rehabilitation, Initiative, Values, and Education) provided substance abuse treatment, intensive center- and home-based social work, and parent education onsite at a high-risk obstetric and pediatric clinic. The second program, the Early Infant Transition Center, enrolled newborns with a history of neonatal abstinence syndrome and their mothers. Based in a renovated rowhouse in East Baltimore, one block away from a major urban hospital, the Early Infant Transition Center provided 24-hour nursing care, oncall physicians and nurse practitioners, social workers, parent education, and onsite sleeping accommodation for parents during their infant's recovery. The third program, Home-U-Go Safely, used community-based nurses to give home-based health monitoring, education, and support to new mothers with a history of cocaine and/or opiate dependence.

Berger, L. M. (2005). "Income, family characteristics, and physical violence toward children." Child Abuse & Neglect **29**(2): 107-133.

Objective: This paper discusses the ways in which existing microeconomic theories of partner abuse, intra-family bargaining, and distribution of resources within families may contribute to our current understanding of physical child abuse. The empirical implications of this discussion are then tested on data from the 1985 National Family Violence Survey (NFVS) in order to estimate the effects of income, family characteristics, and state characteristics on physical violence toward children. Methodology: The sample consists of 2,760 families with children from the NFVS. Probit and ordered probit models are used to explore relationships between income, family characteristics, state characteristics, and physical violence toward children among single-parent and two-parent families. Results: In both single-parent and two-parent families, depression, maternal alcohol consumption, and history of family violence affect children's probabilities of being abused. Additionally, income is significantly related to violence toward children in single-parent families. Conclusions: These results reinforce earlier findings that demographic characteristics, maternal depression, maternal alcohol use, and intra-family patterns of violence may largely contribute to child abuse. This research also suggests that income may play a substantially more important role in regard to parental violence in single-parent families than in two-parent families.

Clark, D. B., J. R. Cornelius, et al. (2005). "Childhood risk categories for adolescent substance involvement: a general liability typology." *Drug Alcohol Depend* **77**(1): 13-21.

Childhood risks for adolescent substance involvement include parental substance use disorders (SUDs), psychological dysregulation and early tobacco and alcohol experimentation. This study was designed to identify childhood risk categories predicting accelerated adolescent substance involvement across drug types and stages. The index subjects were 560 children recruited from high risk (n = 266) or low risk (n = 294) families based on fathers' SUDs. Assessments were conducted at approximately ages 11 (baseline), 13, 16, and 19 years. Childhood predictors included parent SUDs, early tobacco or alcohol use (i.e., substance use), and neurobehavior disinhibition (ND) as determined by indicators of cognitive, affective and behavioral disinhibition. A cluster analysis defined five risk categories based on baseline characteristics as follows: (1) High (n = 31; 100% had both parents with SUDs, 100% had early substance use, and the mean ND score = 58.9); (2) Intermediate-High (n = 76; 45% had one parent with SUD, 100% early substance use and ND = 51.9); (3) Intermediate (n = 76; 100% both parents with SUDs, 0% early substance use and ND = 51.4); (4) Intermediate-Low (n = 161; 100% with one SUD parent; 0% early substance use and ND = 49.9) and; (5) Low (n = 216; no parental SUD, no early substance use and ND = 47.5). Compared with all other groups, children in the High risk group had significantly accelerated substance involvement across all substance types and stages. The ordering of risk categories from low to high was also consistent for all substance involvement outcomes. The findings indicate that these five risk categories constitute general liability classes for adolescent substance involvement, and may identify homogeneous groups of children requiring distinct preventive interventions.

Dube, S. R., R. F. Anda, et al. (2005). "Long-term consequences of childhood sexual abuse by gender of victim." *Am J Prev Med* **28**(5): 430-8.

**BACKGROUND:** Childhood sexual abuse (CSA) is a worldwide problem. Although most studies on the long-term consequences of CSA have focused on women, sexual abuse of both boys and girls is common. Thus, a comparison of the long-term effects of CSA by gender of the victim will provide perspective on the need for future research, prevention activities, and treatment of survivors. **METHODS:** A retrospective cohort study was conducted from 1995 to 1997 among 17,337 adult HMO members in San Diego, California. Participants completed a survey about abuse or household dysfunction during childhood, and multiple other health-related issues. Multivariate logistic regression was used to examine the relationships between severity of CSA (intercourse vs no intercourse) and long-term health and social problems (substance use and abuse, mental illness, and current problems with marriage and family) by gender of victim. Models controlled for exposure to other forms of adverse childhood experiences that co-occur with CSA. Among men, the relationship between the gender of the CSA perpetrator to the outcomes was also examined. **RESULTS:** Contact CSA was reported by 16% of males and 25% of females. Men reported female perpetration of CSA nearly 40% of the time, and women reported female perpetration of CSA 6% of the time. CSA significantly increased the risk of the outcomes. The magnitude of the increase was similar for men and women. For example, compared to reporting no sexual abuse, a history of suicide attempt was more than twice as likely among both men and women who experienced CSA ( $p < 0.05$ ). Compared with those who did not report CSA, men and women exposed to CSA were at a 40% increased risk of marrying an alcoholic, and a 40% to 50% increased risk of reporting current problems with their marriage ( $p < 0.05$ ). **CONCLUSIONS:** In this cohort of adult HMO members, experiencing CSA was common among both men and women. The long-term impact of CSA on multiple health and social problems was similar for both men and women. These findings strongly indicate that boys and girls are vulnerable to this form of childhood maltreatment; the similarity in the likelihood for multiple behavioral, mental, and social outcomes among men and

women suggests the need to identify and treat all adults affected by CSA.

Eng, M. Y., M. A. Schuckit, et al. (2005). "The level of response to alcohol in daughters of alcoholics and controls." Drug and Alcohol Dependence **79**(1): 83-93.

Background: The low level of response (LR) to alcohol is a genetically influenced characteristic related to the development of alcohol use disorders (AUDs). This phenotype is found in men with a family history (FH) of alcoholism, predicts future AUDs, and has heritabilities as high as 60%. However, despite evidence of genetic influences for AUDs in both sexes, the majority of studies evaluating differences in LR across high- and low-risk groups have been conducted on males, and it is unclear how generalizable these results are to women. Methods: Twenty-five women who are family history positive (FHP) for alcohol dependence were matched with 25 women with no FH of alcoholism (FHN) on factors that may impact LR. Using an alcohol challenge paradigm, data on the reaction to a moderate dose of alcohol were gathered over a period of 3.5 h. Assessments included breath alcohol concentrations (BrACs), the Subjective High Assessment Scale (SHAS), as well as body sway or static ataxia. Results: Family history positives reported lower subjective intoxication than FHNs. In addition, when body sway scores were corrected for skewness, FHPs had significantly lower scores on alcohol-related changes in lateral sway. These differences remained after considering the effects of drinking history and BrAC values. Conclusions: This study evaluated the LR to alcohol in the largest sample of alcohol challenges in matched FHP and FHN women to date. Overall, the findings are consistent with most data from earlier investigations of smaller sized samples of FHP women. The results suggest that, similar to sons of alcoholics, a low LR to alcohol might also be characteristic of daughters of alcoholics.

Finkelstein, N., E. Rechberger, et al. (2005). "Building resilience in children of mothers who have co-occurring disorders and histories of violence: intervention model and implementation issues." J Behav Health Serv Res **32**(2): 141-54.

Historically, children of parents with co-occurring substance abuse and mental health disorders and histories of violence/trauma have been overlooked in behavioral health treatment systems. The Women, Co-occurring Disorders and Violence Study (WCDVS) was a 5-year initiative funded by the United States Substance Abuse and Mental Health Services Administration (SAMHSA) that included a Children's Study that explored the treatment needs of children of women with these multiple disorders. This article describes the development of the Children's Study intervention that included clinical assessment, group intervention, and resource coordination/advocacy for children aged 5-10 to build resilience through increasing coping skills, improving interpersonal relationships, and helping coalesce positive identity and self-esteem. Innovative procedures, including the participation of consumer/survivor/recovering women and mothers, in the planning, implementation, and administrative applications of this intervention and study are also highlighted. It is recommended that programs begin to implement family-focused integrated treatment approaches that can potentially increase protective factors for children affected by parental mental illness, substance abuse, and violence.

Graham-Bermann, S. A. and J. Seng (2005). "Violence exposure and traumatic stress symptoms as additional predictors of health problems in high-risk children." J Pediatr **146**(3): 349-54.

OBJECTIVE: To test the hypotheses that both violence and traumatic stress symptoms are associated with negative health status among poor preschool children. STUDY DESIGN: This cross-sectional analysis of a Head Start preschool age cohort (n = 160) studied health outcomes parallel to those assessed in the 2001 National Health Interview Survey of child health (asthma, allergy, attention deficit hyperactivity disorder, global appraisal) as well as two stress-related somatic complaints, gastrointestinal

problems and headache. Risk factors include sociodemographics, mothers' health factors, extent of exposure to violence and maltreatment, and mother- and teacher-reported traumatic stress symptoms. RESULTS: Compared with poor children in the National Health Interview Survey and their Head Start peers, children exposed to violence and those with high levels of traumatic stress had significantly worse outcomes, in a dose-response relation. Being abused, exposed to domestic violence, and having a mother using substances were associated with a higher number of health problems. The hierarchical model established the mother's own poor physical health and the child's level of traumatic stress as the strongest predictors of poor child health. CONCLUSIONS: These two risk factors are amenable to intervention by health care providers who treat children.

Hanlon, T. E., R. J. Blatchley, et al. (2005). "Vulnerability of children of incarcerated addict mothers: Implications for preventive intervention." Children and Youth Services Review **27**(1): 67-84.

This is a preliminary report on the characteristics, experiences, and behavior of 88 adolescent, primarily African-American, children of incarcerated urban addict mothers that examines the association of age, gender, and risk factor profiles with the children's adjustment status defined in terms of self-reported questionnaire information and selected personality/behavioral assessment inventories. In spite of the existence of adverse circumstances in their lives, including the incarceration of their substance-abusing mothers, results revealed that the majority of these children were neither especially deviant nor maladjusted, all but a small percentage having successfully avoided substance abuse and the adoption of a deviant lifestyle at this point in their development. In most cases, mother surrogates (usually a grandmother or other family member) had for many years functioned as primary caregivers of the children prior to the incarceration of their birth mothers, which may have attenuated the negative impact ordinarily associated with a mother's absence from the home. However, there was a general indication of problematic school behavior and vulnerability to deviant peer influences that should be addressed in efforts aimed at preventing the escalation of deviant activity in such children. Also, in almost all cases, there was a readily observable need for the provision of caseworker support services to the current caregivers of the children.

Mullins, S. M., D. E. Bard, et al. "Comprehensive services for mothers of drug-exposed infants: Relations between program participation and subsequent child protective services reports." Child Maltreatment **10**(1): 72.

It is unclear whether intensive services for women using drugs during pregnancy can reduce child maltreatment. Within-subjects, dose-response analyses can be conducted using Child Protective Services (CPS) reports. Dose of services received can indicate either engagement or higher need for services. Using data from an intensive intervention program for mothers of drug-exposed infants, the authors examined associations between CPS reports and (a) dose of services received and (b) a termination status variable combining dose of services received with duration of service involvement and progress on treatment plan goals. Cox regression revealed no association between dose of services and follow-up CPS reports. The termination status variable was strongly related to follow-up CPS reports, such that higher ratings were associated with significantly lower risk of re-report, even after controlling for baseline motivation. Findings suggest that program effects may be detectable using a treatment process-based index that combines dose, duration, and quality of program involvement.

Savonlahti, E., M. Pajulo, et al. (2005). "Interactive skills of infants with their high-risk mothers." Nordic Journal of Psychiatry **59**(2): 139-147.

In this pilot study, the interactive skills of infants with their high-risk, substance-

dependent mothers were explored in residential treatment from pregnancy until the infant was 6 months of age. Fourteen mother-infant pairs were videotaped in feeding and free play situations at 6 months after birth. A comparison, low-risk group consisted of 12 ordinary Finnish mother-infant pairs with minimal clinical risks. The findings show significantly higher levels of dyadic interactive deficiencies among the high-risk mother-infant pairs compared to the low-risk pairs, displayed especially in the feeding situation as lack of mutuality and flat, empty, constricted affective tone of interaction. Also, more interactive deficiencies were found among the high-risk infants compared to the low-risk infants, but the differences were not significant. In this study, this finding might reflect the reduced amount of somatic complications and the benefits of treatment, the impacts of which were not explored. The differences between the high- and low-risk infants were displayed as more withdrawal, depressed mood and avoiding behavior and as less alertness and attentional abilities, robustness and focus on parent's emotional state among the high- risk group.

VanDeMark, N. R., L. A. Russell, et al. "Children of mothers with histories of substance abuse, mental illness, and trauma." Journal of Community Psychology **33**(4): 445.

Children exposed to parental substance abuse, mental illness, and violence face profound challenges, including increased risk for emotional and behavioral problems, substance abuse, and victimization. In this article, we describe the characteristics of a sample of children of women entering treatment. These children had been exposed to domestic violence, frequent child welfare involvement, and residential instability. Parental entry into treatment affords treatment providers an opportunity to intervene early with these children, enabling them to offer supportive and preventive services and to help children build skills to avoid problems later. Treatment providers are encouraged to offer assessment and services to children of parents entering treatment, capitalizing on the opportunity to intervene early with a group of children who are at risk for problems with significant individual and social consequences.

Vig, S., S. Chinitz, et al. (2005). "Young children in foster care: Multiple vulnerabilities and complex service needs." Infants and Young Children **18**(2): 147.

Young children who have been removed from their biological families and placed in foster care are at significant risk for poor developmental outcomes. Their vulnerability is often the result of adverse biological and psychosocial influences: prenatal exposure to alcohol and other drugs, premature birth, abuse and neglect leading to foster placement, and failure to form adequate attachments to their primary caregivers. Children younger than 6 years form the largest group entering foster care, and remain longest in care. Meeting the complex needs of this vulnerable group of young children and their families presents extensive challenges for early intervention service systems. The purpose of the following discussion is to describe the foster care population and the kinds of medical conditions, mental health problems, and developmental disabilities experienced by young children in foster care, and to explore implications for intervention. By increasing their understanding of risk factors, vulnerabilities, and complex service needs, early childhood professionals can become effective advocates and provide services that ameliorate risk and optimize outcomes for these children and their families.

### **Partners/Fathers/Other Family Members**

Guterman, N. B. and Y. Lee (2005). "The role of fathers in risk for physical child abuse and neglect: Possible pathways and unanswered questions." Child Maltreatment **10**(2): 136-149.

Despite overrepresentation of fathers as Perpetrators in cases of severe physical child abuse and neglect, the role they play in shaping, risk for physical child abuse and neglect is not yet well understood. This article reviews the possible father pathways that may contribute to physical child abuse and neglect risk and their existing empirical

support. The present empirical base implicates a set of sociodemographic factors in physical maltreatment risk, including fathers' absence, age, employment status, and income they provide to the family. As well, paternal psychosocial factors implicated in physical child maltreatment risk include fathers' abuse of substances, their own childhood experiences of maltreatment, the nature of fathers' relationships with mothers, and the direct care they provide to the child. However, the empirical base presently suffers from significant methodological limitations, preventing more definitive identification of risk factors or causal processes. Given this, the Present article offers questions and recommendations for future research and prevention.

Hatfield, A. B. and H. P. Lefley "Future Involvement of Siblings in the Lives of Persons with Mental Illness." Community Mental Health Journal **41**(3): 327. **[mental health-specific, but could have implications for family involvement in AOD]**

Siblings are considered logical replacements for aging parental caregivers of persons with severe mental illness. For workshops on future planning conducted with 400 elderly parents, 60 siblings answered a survey regarding their future caregiving expectations, anticipated difficulties, and need for help. Nearly all expected to be involved, but were more likely to provide social and emotional support than the instrumental support offered by their parents. Nearly half indicated that the consumer's hostility and lack of cooperation were major barriers to effective care. It was suggested that siblings need education and help from professionals in assessing behaviors, interacting appropriately, and conferring control of their own lives to their ill relatives. For consumers, social skills and self-esteem training in psychiatric rehabilitation programs should address the area of sibling relationships and reciprocity. Such issues should be dealt with early, rather than later in the course of illness.

Haugland, B. S. M. "Recurrent Disruptions of Rituals and Routines in Families With Paternal Alcohol Abuse\*." Family Relations **54**(2): 225.

Changes in rituals and routines between drinking and sobriety were examined in families in treatment due to paternal alcohol abuse. Information was gathered through a semistructured family interview. Recurrent disruptions of rituals and routines were found between different phases in the drinking cycle. Disruptions were found typically with regard to the fathers' participation in rituals and routines, the parental roles and responsibility, the affective quality of the rituals, and the general family climate. Four categories of families were distinguished based on amount and type of disruptions in family rituals and routines (i.e., protecting, emotional disruptive, exposing, and chaotic families). Implications for intervention are described. Key words: children of alcoholics, family disruption, family rituals and routines, paternal alcohol abuse, unpredictability.

Kirby, K. C., K. L. Dugosh, et al. (2005). "The Significant Other Checklist: measuring the problems experienced by family members of drug users." Addict Behav **30**(1): 29-47.

Historically, much attention has been given to the multifaceted problems experienced by drug abusers. Recently, greater attention has been given to the family members of drug abusers, but unfortunately, most of this attention has focused on family relationships and has overlooked the problems experienced by family members of drug users (DUs). To date, there is no psychometrically sound, multidimensional assessment tool available to systematically assess the economic, behavioral, and psychological problems encountered by these family members. This study presents the findings associated with the initial measurement development phase of such an assessment tool. The initial results are promising, suggesting that the Significant Other Checklist (a) has reasonable initial subscale reliability estimates, (b) assesses problem domains that are relevant to family members of DUs, and (c) is able to identify important group similarities and differences among family members of DUs.

Kidorf, M., V. L. King, et al. (2005). "Involving significant others in the care of opioid-dependent patients receiving methadone." Journal of Substance Abuse Treatment **29**(1): 19-27.

Positive, abstinence-oriented, social support is associated with good substance abuse treatment outcome but few interventions are designed to help patients improve their social supports. This article reports on a behavioral intervention designed to encourage opioid-dependent patients receiving methadone to include drug-free family members or friends in treatment and to use these individuals to facilitate development of a supportive, non-drug-using social network. This report uses data from a quality assurance program review of the treatment response of 59 opioid-dependent outpatients who identified a drug-free significant other to participate in their treatment. Fifty-five (93.2%) brought a significant other (most often the patient's mother, 29%) to both the initial evaluation session and at least one joint session. Social support activities were family-(33%), church-(28%), and self-help group-related (30%). Approximately 78% of patients who participated in the social support intervention achieved at least four consecutive weeks of abstinence. Women responded better than men. We conclude that methadone-maintained patients can and will include non-drug-using family members and friends in treatment, and these individuals can be mobilized to help patients improve their recovery.

McCollum, E. E., T. S. Nelson, et al. (2005). "Partner relationship quality and drug use as predictors of women's substance abuse treatment outcome." Am J Drug Alcohol Abuse **31**(1): 111-27.

This study examined the relationship of relationship quality and partner's drug use on treatment outcomes for women in outpatient drug treatment. The sample consisted of predominately heterosexual couples where the female partner was in drug treatment. Both the partners' perception of relationship quality and the interaction of female client and her partner's perception of relationship quality were significant predictors of one of the outcome variables-the client's posttest report of days of drug use during the previous 30 days. Interestingly, clients reported more days of drug use when their partners reported higher relationship quality. A similar pattern was found with the ASI Drug composite score as the dependent variable except that the interaction term was not significant in that analysis. In addition, partners' relationship quality scores were associated with female clients' treatment completion. A higher proportion of women whose partners reported higher relationship quality failed to complete treatment. Partners' reports of pretest and posttest drug use were not related to women's treatment outcomes.

McMahon, T. J., J. D. Winkel, et al. (2005). "Looking for poppa: parenting status of men versus women seeking drug abuse treatment." Am J Drug Alcohol Abuse **31**(1): 79-91.

This survey of individuals seeking methadone maintenance treatment was pursued to document the parenting status of drug-dependent men and clarify ways their status as parents differs from that of drug-dependent women. Data concerning demographic characteristics, drug abuse history, and parenting status were systematically coded from the medical records of 362 men and 162 women seeking methadone maintenance treatment during a 12-month period. Analysis of parenting status by gender indicated that, although a greater proportion of women were the parent of at least one biological child, there were actually more fathers than mothers within the cohort. Among the parents, fathers were more likely to have been abusing opioids when they first became a parent, and they were more likely to be living away from their children. There were no significant gender differences in the number of children or the average age of children. The results suggested that fathering may be an important, but largely neglected, treatment issue for drug-abusing men.

Raitasalo, K. and M. E. Holmila (2005). "The role of the spouse in regulating one's drinking." Addiction Research & Theory **13**(2): 137-144. **[not U.S.-based population, but useful information in this area where lack info]**

This article examines the relationship between experiences of external influence from spouses and partners to influence one's drinking and one's own concern over drinking; whether spouse's control attempts and concern over one's own drinking are in congruence; how the level of drinking and the frequency of drinking to intoxication and the estimate of the spouse's level of drinking are related, for women and men belonging to different sociodemographic groups. Using data from the 2000 Finnish Drinking Habit Survey ( n = 1337), our results show that ( 1) drinking habits - especially drinking large quantities on a single occasion - are strongly related to both external control from the spouse and one's own concern about drinking and ( 2) there are significant differences between genders in the level of control from the spouse and concern over one's own drinking habit. These results are important when planning treatment and prevention for drinkers and their families.

Rychtarik, R. G. and N. B. McGillicuddy (2005). "Coping skills training and 12-step facilitation for women whose partner has alcoholism: effects on depression, the partner's drinking, and partner physical violence." J Consult Clin Psychol **73**(2): 249-61.

Women (N=171), distressed from their partners' untreated alcoholism, received either coping skills training (CST), 12-step facilitation (TSF), or delayed treatment (DTC). CST and TSF resulted in lower depression levels than DTC but did not differ from one another. Skill acquisition mediated the treatment effects of CST; Al-Anon attendance did not mediate the TSF effect. Lower depression levels were maintained at 12 months with no differences between groups. Partner drinking decreased from pretreatment to follow-up in the CST and TSF conditions. However, for partners with a history of relationship violence, drinking improved across follow-up in the CST condition but worsened in the TSF condition. Partner relationship violence was less in the CST condition. CST may be particularly useful for women experiencing physical violence from a partner with alcoholism.

Weinman, M. L., R. S. Buzi, et al. (2005). "Addressing Risk Behaviors, Service Needs, and Mental Health Issues in Programs for Young Fathers." Families in Society **86**(2): 261.

Young fathers (N = 143) ages 16-33 participated in an assessment of risk behaviors, service needs, and mental health issues upon entering a fatherhood program. Almost 70% were unemployed, 39% were school dropouts, 47% used alcohol, 40% had problems with the law, and 42% had been in jail. The most frequently reported mental health issues were problems related to relationships, neighborhood, family, tobacco use, police, and being a parent. Fathers also identified feeling states of anger, sadness/depression, nervousness/tension, helplessness, and aggression. Although risk behaviors and mental health issues were identified, fathers did not request services to address them; rather, their most frequently requested service needs were related to jobs and vocational training. The article suggests that an assessment of mental health issues that focuses on a strengths perspective might yield a better evaluation of both mental health issues and service needs. The article addresses ways that program planners could enhance realistic participation.