|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Marijuana | Cocaine | Methamphetamine/Amphetamines/Ecstasy | Opiates /Morphine/Heroin/Methadone/Demerol/MeperidineCodeine |
| Possible Physical Symptoms | * Alters neurobehavioral performance (Barros et al., 2006)
* Lower gestational age at delivery
* Increased risk of prematurity (Sherwood et al., 1999)
* Reduction in the heart rate of the fetus (Schaefer, Peters, and Miller, 2007).
* Growth Reduction (Taeusch et al, 2005)
 | * Low birth weight (Bateman et al., 1993)
* Lower length
* Lower head circumference (Bauer et al., 2005)
* IUGR
* Abnormal fetal monitoring and circulatory issues
* Higher heart rates (Schuetze and Eiden, 2006)
* Higher incidence of hypertension (Shankaran et al., 2006)
* Abnormal ABR, possible compromise to auditory system (Tax-Laxa et al, 2004)
* Higher incidence of respiratory distress syndrome
* Meconium staining
* Malformations (Taeusch et al, 2005)
	+ Urogenital
	+ Brain
	+ Midline deformities
	+ Skull defects, encephaloceles
	+ Ocular malformations
	+ Vascular disruptions, such as limb reduction and intestinal atresia
	+ Cardiac
* Neurodevelopmental
	+ Hypertonia
	+ Tremors
	+ Strokes
	+ Seizures
	+ Brainstem conduction relays
 | * More likely to have APGAR of <7 (Ludlow et al., 2004)
* SGA
* Prematurity
* IUGR
* Smaller head circumference
* Lower birthweight
* Transient bradycardia and tachycardia
* Reports of higher incidence of cleft palate and cleft lip
* Congenital defects, including limb anomalies and cardiac septal defects have been reported with Ecstasy use (Taeusch et al, 2005)
 | * More feeding problems (LaGasse et al., 2002)
* More likely to require resuscitation (Ludlow, et al, 2004)
* APGAR scores of methadone-exposed equivalent to those not exposed to opiates
* More feeding problems (LaGasse et al., 2002)
* Higher rates of prematurity, SGA,(Taeusch et al., 2005)
* Methadone treatment can cause bradycardia, tachycardia or an irregular heart rate (Hussain and Ewer, 2007)
 |
| Possible Post-Natal Symptoms | * Neurological symptoms
* Hypertonicity
* Irritability
* Jitteriness
 | * Tremors and jitters (Bauer et al., 2005)
* High pitched cry
* Excessive sucking
* Seizures
* Tachycardia
* Tachypnea
* Apnea
* Hyperirritability (may occur as late as 30 days after birth)
 | * Same as cocaine
* Tremors and jitters (Bauer et al., 2005)
* High-pitched cry
* Excessive sucking
* Possible seizures
* Tachycardia
* Tachypnea
* Apnea
* Hyperirritability (may occur as late as 30 days after birth)
 | Symptoms of Neonatal Abstinence Syndrome (NAS)

|  |
| --- |
| * Central nervous system dysfunction
	+ Irritability
	+ Excessive crying
	+ Jitteriness
	+ Tremulousness
	+ Hyperactive reflexes
	+ Increased tone
	+ Sleep disturbance
	+ Seizures
 |
| * Autonomic dysfunction
	+ Excessive sweating
	+ Mottling
	+ Hyperthermia
	+ Hypertension
 |
| * Respiratory symptoms
	+ Tachypnea (rapid breathing)
	+ Nasal stuffiness
 |
| * Gastrointestinal and feeding disturbances
* Diarrhea
* Excessive sucking
* Hyperphagia (eating too much)
 |

 |
|  | **Marijuana** | **Cocaine** | **Methamphetamine/****Amphetamines/Ecstasy** | **Opiates /Morphine/Heroin/****Methadone/Demerol/Meperidine****Codeine** |
| Issues at delivery | * Late prenatal care (Burns et al., 2006)
* More often required NICU admission
 | * Placental abruption (Ananth et al., 2006)
* Premature ROM (Addis et al., 2001)
* Pre term labor
* Less/late prenatal care (Fajemirokin-Odudeyi et al., 2004)
* Premature Delivery/prematurity
* High risk of maternal death from intracerebral hemorrhage
* Stillbirth
* High risk of perinatal HIV
* Higher risk of syphilis
 | * Higher incidence of stillbirth
* Poor prenatal care
* Sexually transmitted diseases
* Abruptio Placenta
* Postpartum hemorrhage
 | * Late prenatal care (Burns et al., 2006)
* More often require NICU admission
* Antepartum hemorrhage
* Increased risk of HIV (if mother an intravenous heroin user)
* More likely to require resuscitation (Ludlow et al, 2004)
* Higher incidence of placental abruption
* Higher incidence of premature delivery, preterm labor
* Higher incidence of chorioamnionitis
* Higher rates of meconium staining
 |
| Long Term Impacts | * First trimester exposure affects child’s depression and anxiety symptoms
* Second trimester affects reading comprehension (Goldschmidt et al., 2004)
* Speech and thought impairments (Schaefer, Peters, and Miller, 2007)
 | * Higher infection rates
* Negative behavioral outcomes at 3, 5 and 7 year follow-up (Bada et al., 2007)
* Lower IQ scores
* Higher risk of SIDS
 | * Hyperactivity
* Sleep disturbances
* Aggressiveness
 | * Higher incidence of SIDS
 |
| Other information | * In children and adults with pre-existing respiratory problems, worsening of these symptoms may occur with even the slightest exposure to these gases.
* (Martyny et al, 2004)
 | * Mothers more likely to be poly drug users
 | * Mothers have lower quality of life perceptions
* Greater likelihood of substance use in family and social system
* Increased risk for ongoing legal difficulties
* Increased likelihood of development of a substance abuse disorder (Derauf et al., 2007)
 |  |
| Breastfeeding | * Marijuana passes into the breast milk
* Half life of up to 57 hours.
* Breastfeeding should not occur if marijuana is being used. Exposure to marijuana via breast milk has been associated with delayed motor development (Schaefer, Peters, and Miller, 2007).
 | * Cocaine appears in breast milk within 15 minutes
* Half life of less than ½ hour
* Clears within 5 hours.
* If a mother uses cocaine while breastfeeding, it is recommended that she pump and discard the breast milk for the following 24 hours.
* Mothers habitually using cocaine should not breastfeed (Schaefer, Peters, and Miller, 2007)
 | * Amphetamines pass into breast milk.
* Half life is unknown.
* Women taking amphetamines should not breastfeed (Schaefer, Peters, and Miller, 2007)
 | * All opiates pass into breast milk.
* Mothers using heroin should not breastfeed.
* Methadone does appear to be well tolerated by the infant when breastfed.
* Breastfeeding is strongly recommended, as the infant is not being quickly withdrawn from the methadone. The American Academy of Pediatrics (2007)
 |

References

 Addis, A., Moretti, M. E., Syed, F. A., Einarson, T. R., & Koren, G. (2001). Fetal effects of cocaine: an updated meta-analysis. *Reproductive Toxicology, 15*, 341-369.

Ananth, C. V., Getahum, D., Peltier, M. R., & Smulian, J. C. (2006). Placental Abruption in Term and Preterm Gestations: Evidence for Heterogeneity in Clinical Pathways. *Obstetrics & Gynecology, 107*(4), 785-792.

Bada, H. S., Das, A., Bauer, C. R., Shankaran, S., Lester, B., LaGasse, L., et al. (2007). Impact of prenatal cocaine exposure on child behavior problems through school age. *Pediatrics, 119*(2), e348-359.

Barros, M. C. M., Guinsburg R, Peres C A, Mitsuhiro S, Chalem, E., & Laranjeira, R. (2006). Exposure to marijuana during pregnancy alters neurobehavior in the early neonatal period. *The Journal of Pediatrics, 149*(6), 781-787.

Bateman, D. A., Ng, S. K. C., Hansen, C. A., & Heagarty, M. C. (1993). The Effects of Intrauterine Cocaine Exposure in Newborns. *American Journal of Public Health, 83*(2), 190-193.

Bauer, C. R., Langer, J. C., Shankaran, S., Bada, H. S., Lester, B., Wright, L. L., et al. (2005). Acute Neonatal Effects of Cocaine Exposure During Pregnancy. *Archives of Pediatrics and Adolescent Medicine, 159*(9), 824-834.

Burns, L., Mattick, R. P., & Cooke, M. (2006). The use of record linkage to examine illicit drug use in pregnancy. *Addiction, 101*(6), 873-882.

Derauf, C., LaGasse, L. L., Smith, L. M., Grant, P., Shah, R., Arria, A., et al. (2007). Demographic and Psychosocial Characteristics of Mothers Using Methamphetamine During Pregnancy: Preliminary Results of the Infant Development, Environment, and Lifestyle Study (IDEAL). *The American Journal of Drug and Alcohol Abuse, 33*(2), 281 - 289.

Fajemirokun-Odudeyi, O., & Lindow, S. W. (2004). Obstetric implications of cocaine use in pregnancy: a literature review. *European Journal of Obstetrics & Gynecology and Reproductive Biology, 112*(1), 2-8.

Goldschmidt, L., Richardson, G. A., Cornelius, M. D., & Day, N. L. (2004). Prenatal marijuana and alcohol exposure and academic achievement at age 10. *Neurotoxicology and Teratology, 26*(4), 521-532.

Hussain, T., & Ewer, A. K. (2007). Maternal methadone may cause arrhythmias in neonates. *Acta Paediatrica, 96*(5), 768-769.

LaGasse, L. L., Messinger, D., Lester, B. M., Seifer, R., Tronick, E. Z., Bauer, C. R., et al. (2003). Prenatal drug exposure and maternal and infant feeding behaviour. *Archives of Disease in Childhood - Fetal and Neonatal Edition, 88*(5), F391-399.

Ludlow, J. P., Evans, S. F., & Hulse, G. (2004). Obstetric and perinatal outcomes in pregnancies associated with illicit substance abuse. *The Australian and New Zealand Journal of Obstetrics and Gynaecology, 44*(4), 302-306.

Martyny, J. W., Arbuckle, S. L., McCammon, C. S., Esswein, E. J., & Erb, N. (2004). Chemical exposures associated with clandestine methamphetamine laboratories. *Scientific Report 2004*.

Schaefer, C., Peters, P., & Miller, R. K. (Eds.). (2007). *Drugs During Pregnancy and Lactation: Treatment options and risk assessment* (Second ed.). London: Academic Press.

Schuetze, P., & Eiden, R. D. (2006). The Association Between Maternal Cocaine Use During Pregnancy and Physiological Regulation in 4- to 8-Week-Old Infants: An Examination of Possible Mediators and Moderators. *Journal of Pediatric Psychology, 31*(1), 15-26.

Shankaran, S., Das, A., Bauer, C. R., Bada, H., Lester, B., Wright, L., et al. (2006). Fetal Origin of Childhood Disease: Intrauterine Growth Restriction in Term Infants and Risk for Hypertension at 6 Years of Age. *Archives of Pediatric and Adolescent Medicine, 160*(9), 977-981.

Sherwood, R. A., Keating, J., Kavvadia, V., Greenough, A., & Peters, T. J. (1999). Substance misuse in early pregnancy and relationship to fetal outcome. *European Journal of Pediatrics, 158*(6), 488 - 492.

Taeusch, H. W., Ballard, R. A., & Gleason, C. A. (Eds.). (2005). *Avery's Diseases of the Newborn* (Eighth ed.). Philadelphia: Elsevier Saunders.

Tan-Laxa, M. A., Sison-Switala, C., Rintelman, W., & Ostrea Jr., E. M. (2004). Abnormal Auditory Brainstem Response Among Infants With Prenatal Cocaine Exposure. *Pediatrics, 113*(2), 357-360.

 Funded by a Community Grant from the March of Dimes.

Also Sponsored in part by The West Virginia Perinatal Partnership A project of the West Virginia Healthy Kids and Families Coalition and West Virginia Community Voices Funded by the Claude Worthington Benedum Foundation