Tool Kit

For Children Prenatally Drug Exposed

May 2010

MISD

early on® MICHIGAN

MACOMB INTERMEDIATE SCHOOL DISTRICT
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We are the Macomb Intermediate School District.

We exist to provide our clients quality service, high caliber support, and cutting edge leadership.

Our primary clients are the 21 school districts of Macomb County. They are our most important customers – indeed, our reason for being.

Within these districts we focus our efforts on school staff. We work to increase their skills and capabilities so their students can experience more effective educational programs.

We also serve the handicapped. In fact, we are committed to working directly with youngsters with disabilities who reside in Macomb County's school districts.

And we are involved with the educational community across the country. Many of our staff members are leaders in state and national programs. Many are working with colleges and universities. Still others are exchanging information with their professional colleagues. All these activities have a single purpose: to identify and develop techniques and programs that improve learning opportunities in Macomb County.

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Preamble

Why are we doing this?

The number of children born each year exposed to drugs and/or alcohol is estimated to be between 550,000 and 750,000 (ARCH Factsheet Number 49, 1997). The problems associated with prenatal drug and substance abuse are increasing and have serious implications for the future development of these children and the families affected. It is important to remember that any drug can have an impact on an unborn child. It does not matter if the drug is legal or illegal, prescribed by a doctor, or even how it is taken. Swallowing a drug will deliver it to the baby through the placenta while injecting and inhaling a drug delivers it in larger amounts. It is vital that anyone involved with drug-exposed infants and children have knowledge of both the potential health and developmental effects as well as an understanding of possible intervention strategies. It is not uncommon for a child who has been prenatally exposed to drugs and/or alcohol to have been poly-drug exposed.

It is hoped that this toolkit can be used by service providers and families to best serve our children who have been prenatally exposed. It is not meant to be all inclusive, but rather it is meant to provide research, insight, and guidance as a compilation of the important and current information about prenatal exposure and the effects on children and families.

Quick Facts:

Drugs

- Each year, 11% of all newborns, or 459,690, are exposed to *illicit* drugs. *(Chasnoff, 1989)*
- More than 739,000 women each year use one or more illicit drugs during pregnancy. *(Gomby and Shiono, 1991)*
- A substance exposed infant is born more frequently than once every 90 seconds. *(Schipper, 1991)*

Alcohol

- 2.6 million infants each year are prenatally exposed to alcohol. *(Gomby and Shiono, 1991)*
- Fetal Alcohol Syndrome (FAS) affects between 1.3 and 2.2 children per 1,000 live births in North America each year. *(Streissguth and Giunta, 1988; US DHHS, 1990)*
- Cases of Alcohol Related Birth Defects (ARBD) outnumber cases of FAS by a ratio of 2 to 3 to 1. *(Abel and Dintcheff, 1984; Streissguth and Giunta, 1988)*

(statistics.adoption.com)

Drugs Facts

Marijuana

Marijuana is the most commonly used drug in the United States. It is made up of dried parts of the Cannabis sativa hemp plant. Short-term effects of marijuana use include euphoria, distorted perceptions, memory impairment, and difficulty thinking and solving problems. Not surprisingly, marijuana intoxication can cause distorted perceptions, impaired coordination, difficulty in thinking and problem solving, and problems with learning and memory. Research has shown that marijuana's adverse impact on learning and memory can last for days or weeks after the acute effects of the drug wear off. As a result, someone who smokes marijuana every day may be functioning at a suboptimal intellectual level all of the time. Long-term marijuana abuse can lead to addiction; that is, compulsive drug seeking and abuse despite its known harmful effects upon social functioning in the context of family, school, work, and recreational activities. Long-term marijuana abusers trying to quit report irritability, sleeplessness, decreased appetite, anxiety, and drug craving, all of which make it difficult to quit. These withdrawal symptoms begin within about 1 day following abstinence, peak at 2–3 days, and subside within 1 or 2 weeks following drug cessation (National Institute on Drug Abuse).

Effects of Marijuana usage during Pregnancy

Smoking marijuana during pregnancy has been linked to low birth weights in babies and withdrawal-like symptoms including excessive crying, tremors, and hyper-emesis (severe and chronic vomiting). Some studies, though not all, show that women who use marijuana even as infrequently as once a month throughout pregnancy are more likely to gain inadequate weight, to have dangerously rapid labor, prolonged or arrested labor, or a cesarean section. They are also more likely to have a baby that needs resuscitation after delivery (Pregnancy Info).

Effects on Children Exposed to Marijuana in Utero

There have been a limited number of studies following marijuana-exposed babies through childhood. Some did not find any increased risk of learning or behavioral problems. Others found that children who were exposed to marijuana before birth are more likely to have subtle problems that affect their ability to pay attention. Exposed children do not appear to have a decrease in IQ (March of Dimes).

Alcohol

Alcohol affects every organ in the drinker's body and can damage a developing fetus. Intoxication can impair brain function and motor skills; heavy use can increase risk of certain cancers, stroke, and liver disease. Alcoholism or alcohol dependence is a diagnosable disease characterized by a strong craving for alcohol, and/or continued use despite harm or personal injury. Alcohol abuse, which can lead to alcoholism, is a pattern of drinking that results in harm to one's health, interpersonal relationships, or ability to work (National Institute on Drug Abuse).

Effects of Alcohol usage during Pregnancy

Drinking alcohol during pregnancy increases the risk for miscarriage and premature birth. Studies also suggest that drinking during pregnancy may contribute to stillbirth. No level of drinking alcohol has been proven safe during pregnancy.

Effects on Children Exposed to Alcohol in Utero

Drinking alcohol during pregnancy can cause Fetal Alcohol Spectrum Disorders, with effects that range from mild to severe. These effects include mental retardation; learning, emotional and behavioral problems; and defects involving the heart, face and other organs. The most severe of these effects is fetal alcohol syndrome (FAS), a combination of physical and mental birth defects (March of Dimes).

Hallucinogens

Hallucinogens are strong mood-changing drugs with unpredictable psychological effects. LSD, or "acid," is sold as tablets, capsules, liquid, or on absorbent paper. PCP is illegally manufactured as tablets, capsules, or colored powder and can be snorted, smoked or eaten. Other hallucinogens can come in many forms, including plants and cough suppressants. The effects of hallucinogens differ greatly from person to person, time to time, and from drug to drug. This is mainly due to the significant differences in strength, amount, and chemical makeup of active ingredients. Because of their unpredictable nature, the use of hallucinogens can be particularly dangerous. People who abuse PCP for long periods of time report memory loss, difficulties with speech and thinking, depression, and weight loss. These symptoms can persist up to a year after stopping PCP abuse. LSD has an unusual "echo." Many users have flashbacks — sudden repetitions of their LSD experiences — days or months after they stop using the drug. Hallucinogen-related deaths (with the possible exception of MDMA and PCP) often result from accidental injury or suicide from the uncontrolled actions and emotions caused by intoxication (Above the Influence).

Effects of Hallucinogen usage during Pregnancy

PCP has been shown to cross through the placenta, collecting in the tissue of the fetus and remaining in the circulation for an extended period after the mother's last ingestion of the drug. This means that the fetus is exposed to the drug for longer periods of time than the mother (AADAC.com).

Negative outcomes that may arise due to hallucinogen consumption during pregnancy include:

- Premature labor and delivery: the baby is born before full term
- Maternal abruption: the premature separation of the placenta from the wall of the uterus, a potentially very serious situation for both mother and baby

- Low birth weight: a child born smaller than average is at increased risk for developing health problems as it grows
- Birth defects: PCP is suspected to contribute to some physical abnormalities noted at birth, including facial deformities

Effects on Children Exposed to Hallucinogen Usage in Utero

PCP exposure has been associated with poor attention, rigid muscles and decreased reflexes in infants. Infants exposed to hallucinogens prior to birth are at risk of experiencing withdrawal symptoms once they are no longer exposed to the drug. Children prenatally exposed to hallucinogens are at increased risk for experiencing functional and behavioral impairments.

Methamphetamines

Methamphetamine is a central nervous system stimulant drug. It is a "white, odorless, bitter-tasting crystalline powder that easily dissolves in water or alcohol and is taken orally, intra-nasally (snorting the powder), by needle injection, or by smoking" (National Institute on Drug Abuse, n.d.). When it is used, the drug:

> ". . . increases the release and blocks the reuptake of the brain chemical (or neurotransmitter) dopamine, leading to high levels of the chemical in the brain—a common mechanism of action for most drugs of abuse. Dopamine is involved in reward, motivation, the experience of pleasure, and motor function. Methamphetamine's ability to release dopamine rapidly in reward regions of the brain produces the intense euphoria, or "rush," that many users feel after snorting, smoking, or injecting the drug" (National Institute on Drug Abuse, n.d.).

How a methamphetamine user's body reacts is dependent upon how much it has used and how long it has been using it. Small amounts of the drug can have the same effects as other stimulant drugs (cocaine) "including increased wakefulness, increased physical activity, decreased appetite, increased respiration, rapid heart rate, irregular heartbeat, increased blood pressure, and hyperthermia"(National Institute on Drug Abuse, n.d.). Long-term use of the drug can have long-term negative consequences on the user's health. These can include:

> ". . . extreme weight loss, severe dental problems ("meth mouth"), anxiety, confusion, insomnia, mood disturbances, and violent behavior. Chronic methamphetamine abusers can also display a number of psychotic features, including paranoia, visual and auditory hallucinations, and delusions (for example, the sensation of insects crawling under the skin)"(National Institute on Drug Abuse, n.d.).

Methamphetamines can remain in a user's system for 3-4 days.

Effects of Methamphetamines used During Pregnancy

Use of methamphetamine during pregnancy increases the risk of pregnancy complications, such as premature birth and placental problems. There also have been cases of birth defects, including heart defects and cleft lip/palate, in exposed babies, but researchers do not yet know whether the drug contributed to these defects (March of Dimes, n.d.).

Effects on Children Exposed to Methamphetamines in Utero

- Increased risk of developing attention difficulties, behavioral difficulties, and
- Learning disabilities, especially in the area of language
- Increased risk of prematurity or low birth weight babies who may show:
  - Difficulty sucking and/or swallowing
  - Hypersensitivity to touch and light and therefore, difficult in soothing
  - Extreme irritability
  - Tremors and coordination problems

www.health.state.mn.us/divs/eh/meth
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Crack/Cocaine

Cocaine is a central nervous system stimulant drug that can be snorted, smoked, or injected. Crack is the rock form of cocaine, "cocaine hydrochloride powder that has been processed to form a rock crystal that is then usually smoked" (National Institute on Drug Abuse, n.d.). The user can feel euphoric and energetic, but the physical effects on the body can:

". . . increase body temperature, blood pressure, and heart rate. Users risk heart attacks, respiratory failure, strokes, seizures, abdominal pain, and nausea. In rare cases, sudden death can occur on the first use of cocaine or unexpectedly afterwards" (National Institute on Drug Abuse, n.d.).

Cocaine will stay in the system in some form for roughly forty-eight hours, depending on the method of administration. The size and method of administering the dosage will have an effect on how long it takes for the cocaine to metabolize and leave the system.

Effects of Cocaine usage During Pregnancy

If cocaine is used early in the pregnancy it has been to known to cause miscarriages. It has also been known to cause pre-term labor (labor before 37 weeks).

"Cocaine use during pregnancy can cause placental problems, including placental abruption. In this condition, the placenta pulls away from the wall of the uterus before labor begins. This can lead to heavy bleeding that can be life threatening for both mother and baby. The baby may be deprived of oxygen and adequate blood flow when an abruption occurs. Prompt cesarean delivery, however, can prevent most deaths but may not prevent serious complications for the baby caused by lack of oxygen" (March of Dimes, n.d.).

Effects on Children Exposed to Cocaine in Utero

Immediately after birth, some cocaine-exposed infants:

- Are jittery, have tremors, irritable, and sensitive to the mildest environmental stimulation
- Have stiff muscles and prolonged early reflexes
- Cry often, trouble falling asleep and easily awakened, difficulty calming themselves
- *Or* can display the opposite effect by sleeping most of the time and appear to shut down to avoid stimuli

Most of these symptoms will diminish within the first year. Irritability, sleep and feeding problems and difficulty with calming may continue into the second year.
These cocaine-exposed babies are also at an increased risk for developmental problems such as cerebral palsy, seizure disorder, and mental retardation. As they grow older, they may also have difficulty with:

- Less age-appropriate play and more impulsive behaviors than non-exposed infants
- Less secure attachment to their caregivers
- Delayed language development
- Lack of tolerance for frustration, easily distracted, and difficulty organizing their behavior

Opiates

Opiate drugs are any group of drugs that are derived from opium. They are used to alleviate pain and can include naturally occurring opiates as well as synthetic forms. Codeine and morphine are naturally occurring while, others are:

- heroin
- hydrocodone
- hydromorphone (Dilaudid)
- meperidine (Demerol)
- oxycodone (Percodan)
- fentanyl (Sublimaza)
- methadone (Dolophine)
- propoxyphene (Darvon)
- pentazocine (Talwin)

All opiate drugs have similar effects to varying degrees. Short-term effects include a surge of euphoria and clouded thinking followed by alternately wakeful and drowsy states (National Institute on Drug Abuse, n.d.). The biggest side effect that users report is constipation. "Heroin depresses breathing, thus, overdose can be fatal. Users who inject the drug risk infectious diseases such as HIV/AIDS and hepatitis" (National Institute on Drug Abuse, n.d.).

Opiates will stay in your system for 2 to 5 days depending on the amount used. An opiate will remain in the bloodstream for 6-12 hours.

Effects of Opiate usage During Pregnancy

Women who use heroin during pregnancy greatly increase their risk of serious pregnancy complications. These risks include poor fetal growth, premature rupture of the membranes, premature birth and stillbirth.

A pregnant woman who uses heroin should not attempt to suddenly stop taking the drug. This can put her baby at increased risk of death. She should consult a health care provider or drug-treatment center (March of Dimes, n.d.).

Effects on Children Exposed to Opiate in Utero

Newborn infants born to opiate addicted mothers often experience withdrawal symptoms.

Newborn infants of opiate-using mothers may go through withdrawal, called "neonatal abstinence syndrome," which consists of central nervous system and digestive system symptoms that may include irritability, poor feeding, poor weight gain, ineffective sucking, yawning, sneezing and tremulousness, and sometimes seizures. They are often of low birth weight and have small head circumference, conditions associated with increased risk for later developmental problems. Most withdrawal symptoms disappear by age 2 months, but the irritability may persist during the first year or longer, contributing to caretaking difficulties similar to those encountered by parents of cocaine-affected infants (The Future of Children n.d.).

Whether or not the infant experiences withdrawal, they still may be hypersensitive to stimuli. This can be helped by keeping the lights and noise down low and swaddling.

Methadone

Methadone is a long-acting opioid that is often used to block the effects of other opioids. Using methadone as a treatment for opioid addiction is called Methadone Maintenance Treatment (MMT) and will not cause birth defects but can cause withdrawal. Withdrawal from MMT does not mean the baby is addicted. Babies born to mothers on methadone do as well as other babies. While it is not known the long-term effects of methadone on infants, their health is much better than babies born to mothers on heroin (SAMSHA Center for Substance Abuse Treatment). MMT is important to prevent withdrawal in the mother because withdrawal symptoms can lead to miscarriage or premature birth. In addition, needles are a primary source of infection for the drug user. That infection can pass on to the fetus so MMT is used to help stop the use of needles. Appropriate MMT also has several other benefits for the mother:

- Reduces or eliminates craving for opioid drugs
- Prevents the onset of withdrawal for 24 hours or more
- Blocks the effects of other opioids
- Promotes increased physical and emotional health
- Raises the overall quality of life of the patient

(SAMSHA)

Drug Effects on Mother and Infant (http://www.webmd.com/baby/tc/alcohol-effects-on-a-fetus-topic-overview & http://emedicine.medscape.com/article/978492-overview)

Substance	Possible effect on mother	Stays in User's System	Possible effect on fetus, newborn, and child	Stays in Infant's System	Withdrawal Symptoms (how often the mother used the drug determines the severity of the newborn's withdrawal)
Alcohol	• Lack of certain vitamins • Miscarriage • Stillbirth	2-3 hrs/ drink	• Low birth weight • Mental retardation • Heart problems • Learning and behavior problems • Fetal alcohol syndrome	4-6 hrs/ drink	Signs of alcohol withdrawal may include hyperactivity, crying, irritability, poor sucking, tremors, seizures, poor sleeping patterns, hyperphagia, and diaphoresis. Signs usually appear at birth and may continue until age 18 months. Withdrawal typically appears within 3-12 hours after delivery.
Cocaine	• Seizures • Hallucinations • Fluid in the lungs (pulmonary edema) • Breathing problems • Heart problems • Placenta abruption • Miscarriage • Stillbirth	48 hrs	• Low Apgar score • Stroke • Deformed reproductive or urinary organs • Sudden infant death syndrome (SIDS)	48-72 hours	Acute signs such as tremors, high-pitched cry, irritability, excess suck, hyper-alertness, apnea, and tachycardia can be seen with the first 72 hours of life. However, because these signs can be seen before the typical half-life of a dose immediately prior to delivery, one can argue that these signs are more typical of intoxication, rather than withdrawal.

Heroin (Opiate)	• Preeclampsia • Bleeding in the third trimester • Placenta abruption • Breech birth	2-5 days (in bloodstream 6-12 hrs)	• Seizures • Addiction, withdrawal symptoms after birth • Breathing problems • Small size at birth • Physical and mental development problems	6-8 hrs after birth withdrawal symptoms occur	Signs of withdrawal include hyperirritability, gastrointestinal dysfunction, respiratory distress, and vague autonomic symptoms (eg, yawning, sneezing, mottling, fever). Tremors and jittery movements, high-pitched cries, increased muscle tone, and irritability are common. Normal reflexes may be exaggerated. Loose stools are common, leading to possible electrolyte imbalances and diaper dermatitis. o Long-term symptoms have been difficult to study, but evidence supports that these children show hyperphagia, increased oral drive, sweating, hyperacusis, irregular sleep patterns, poor tolerance to environmental changes, and continued loose stools.
Methadone	• Preterm labor • Fetus' growth slows down • Nausea • Vomiting • Severe constipation	1-7 days	• Fetus will become addicted to methadone • Seizures due to withdrawal • Increased risk of SIDS • Gastro-intestinal dysfunction • Hyper-irritability • Respiratory distress • Developmental delays • Low birth weights •	6-8 hrs after birth withdrawal symptoms occur	Symptoms typically appear within 48-72 hours but may not start until the infant is aged 3 weeks. This is particularly true for infants whose mothers took excessively higher doses. Conflicting data have emerged concerning withdrawal severity and higher in-utero methadone doses. Data have shown that co-exposure with nicotine increases the severity and duration of the neonatal withdrawal.
Marijuana	• Preterm labor	10 days	• Tremors • Easily startled • Cranky or fussy		For marijuana, a mild opiate like withdrawal syndrome has been observed. Signs may include fine tremors, hyper-acusis, and a

			• Learning problems • Attention deficit hyperactivity disorder • Depression • Substance abuse • Leukemia • Certain types of cancer		prominent Moro reflex; however, these symptoms rarely require treatment.
Methamphetamine	• Stroke • Brain damage • Miscarriage • Placenta abruption	3-4 days	• Low birth weight • Heart and lung problems		Methamphetamine withdrawal symptoms can include nausea, irritability, depression, loss of energy, insomnia, sweats, hyperventilation, convulsions, irregular heart beat
Hallucinogens (PCP/LSD)	• Confusion • Delusions • Hallucinations • Risk of overdose	2-5 days	• Withdrawal symptoms after birth • Learning problems • Emotional problems • Behavior problems		There are few withdrawal symptoms reported, but some effects of long term use may include: weight loss, flashbacks, paranoia and depression.

Prescription Medications

Prescription drug abuse is known as taking a prescribed medication that is not prescribed to the user of the drug or taking it for reasons or in dosages other than as prescribed. The biggest side effect of prescription drug abuse is addiction. There are prescription medications that are commonly abused and these can include:

> opioids (for pain), central nervous system depressants (for anxiety and sleep disorders), and stimulants (for ADHD and narcolepsy). Opioids include hydrocodone (Vicodin®), oxycodone (OxyContin®), propoxyphene (Darvon®), hydromorphone (Dilaudid®), meperidine (Demerol®), and diphenoxylate (Lomotil®). Central nervous system depressants include barbiturates such as pentobarbital sodium (Nembutal®), and benzodiazepines such as diazepam (Valium®) and alprazolam (Xanax®). Stimulants include dextroamphetamine (Dexedrine®), methylphenidate (Ritalin® and Concerta®), and amphetamines (Adderall®)(National Institute on Drug Abuse, n.d.).

Depending upon the type of prescription medication, the side effects are varied.

> Long-term use of opioids or central nervous system depressants can lead to physical dependence and addiction. Opioids can produce drowsiness, constipation and, depending on amount taken, can depress breathing. Central nervous system depressants slow down brain function; if combined with other medications that cause drowsiness or with alcohol, heart rate and respiration can slow down dangerously. Taken repeatedly or in high doses, stimulants can cause anxiety, paranoia, dangerously high body temperatures, irregular heartbeat, or seizures (National Institute on Drug Abuse n.d.).

It is important to note that there are instances when a pregnant woman may take necessary prescription drugs under a doctor's surveillance. During these circumstances, the doctors choose to keep or place the women on the drug because they believe the benefits outweigh any potential risk. Because there are few studies available involving women undergoing treatment without the knowledge of being pregnant, it is harder to know the true effects of the medication. There is the possibility that the condition being treated, not the medication, is the true cause of the effects.

In pregnant women, the use of psychotropic medications, especially benzodiazepines, is associated with adverse perinatal outcomes, according to a study in the December issue of the *American Journal of Obstetrics & Gynecology*.

The researchers found that pregnant women who used benzodiazepines had a dramatically increased risk of preterm delivery (adjusted odds ratio, 6.79), as well as increased risks of low birth weight, low Apgar score, neonatal intensive care unit admission, and respiratory distress syndrome. They also found an association between initiation of selective serotonin receptor inhibitor (SSRI) use after the first trimester and preterm delivery (Ansorge, 2009-Mental Help.net).

In addition, women who are taking certain types of seizure medications can put the fetus at risk of Fetal Valproate Syndrome. Fetal Valproate Syndrome is a rare congenital disorder caused by exposure of the fetus to valproic acid (dalpro, depakene, depakote, depakote sprinkle, divalproex, epival, myproic acid) during the first three months of pregnancy. Valproic acid is an anticonvulsant drug used to control certain types of seizures in the treatment of epilepsy. A small percentage of pregnant women who take this medication can have a child with Fetal Valproate Syndrome. The exact prevalence of this condition remains to be established. Symptoms of this disorder may include spina bifida, distinctive facial features, and other musculoskeletal abnormalities (NORD, 2010, children.webmd.com).

Little is also known about the effects of medications/drugs on the baby if the father takes them. It is only believed to have an effect on sperm production and little more.

Prescription medications can stay up to 72 hours in a user's system.

Effects of Prescription medication usage during pregnancy

Both prescription drugs prescribed by a health care provider and over the counter medications are ranked according to how safe they are for the fetus and how necessary they are for the mother by the U.S. Food and Drug Administration. (See Appendix A for specific prescription drug rankings.) The FDA system ranks them as follows:

Category A - These drugs have been demonstrated not to pose any risks to human fetuses.

Category B - These drugs are believed not to pose any significant risk to human fetuses, based on what has been learned from animal or human studies, but there have been no controlled studies in pregnant women.

Category C - These drugs may or may not be harmful to human fetuses. The data is inconclusive; either because no studies have been done or because any adverse affects that have been demonstrated have shown up in animal rather than human studies. These drugs should be given only if the potential benefit justifies the potential risk to the fetus.

Category D - These drugs are known to pose a threat to human fetuses, but they may be commonly found in cases where the benefits of using the drug outweigh these risks (e.g., when the situation is life-threatening or for a serious disease when safer drugs are not an option because they are ineffective).

Category X - These drugs have been proven to cause fetal abnormalities in humans and should not be used under any circumstances during pregnancy. (In other words, Category X drugs are FDA-approved, but they are not to be used by pregnant women.) (Physicians Desk Reference, 1999).

Effects on Children Exposed to Drugs in Utero

Health Conditions:

- **Birth Weight** – Drug-exposed infants often are born small with low birth weight. Because of this, they are more likely to have serious medical problems and developmental delays. There is an, "…increased risk of neurosensory deficits, behavioral and attention deficits, psychiatric problems, and poor school performance," (ARCH Factsheet Number 49).

- **Prematurity** – The risk of being born too early is higher in drug-exposed infants often resulting in acute medical problems following delivery with an extended hospital stay. These babies also are at greater risk for, "…bleeding of the brain tissue, hydrocephalus, bronchial problems, eye disease, and interferences with the normal ability to feed," (ARCH).

- **Failure to Thrive** – Weight loss, slow weight gain, and not reaching developmental milestones are symptoms of FTT. This is often because the infants have difficulty sucking, problems swallowing, and are easily distracted. FTT can be due both to medical or environmental factors with infants suffering from neglect.

- **Neurobehavioral symptoms** – Withdrawal symptoms can occur within 72 hours after birth. These symptoms include tremors, irritability, red and dry skin, fever, sweating, diarrhea, excessive vomiting, and even seizures.

- **Infectious diseases** – Chlamydia, syphilis, gonorrhea, hepatitis B, HIV, and AIDS are common infectious diseases given to the baby by the drug-using mother.

- **Sudden Infant Death Syndrome** – Apnea/cardiac monitoring is recommended for drug-exposed infants because of the increased risk of dying from SIDS.

- **Fetal Alcohol Syndrome** – Growth problems, central nervous system abnormalities, and facial abnormalities are factors of FAS. These children can have learning disorders, social-emotional problems, and other disabilities.

Developmental Outcomes:

If the child is in a structured and nurturing environment, many are able to grow and develop quite typically. Only a small percentage of children have been found to have moderate to severe developmental problems (ARCH). The list below discusses possible developmental outcomes of prenatal drug exposure on infants and children. For specific drugs and their effects, see the table beginning on page 11.

Service Coordinator Considerations

- **Motor Development** – Children from birth to 15 months prenatally exposed often exhibit poor fine, gross, and oral motor skills. Studies have shown rigidity as well as significant delays in the emergence of their equilibrium reactions and acquisition of their transitional motor skills. Dystonia is often present, but can resolve in as early as 8 months or last until 24 months. As these children grow older, motor deficits, including difficulty with motor planning, can be present. Motor planning includes initiating and sequencing movements in a motor activity, coordinating bilateral movement, and rapidly alternating movements. These children also show persistent fine tremors and a lack of coordination. Everyday activities that can be affected include speaking, walking, buttoning, tying, and using scissors. Children also showed a weakness in sensorimotor integration, spatial awareness, orientation, directionality, and left-right discrimination. (Budden, Sarojini. Intrauterine Exposure to Drugs and Alcohol: How Do The Children Fare, 1996).

- **Cognitive Development** – The affects on cognitive development have been shown to range from mild to severe, depending upon the type of exposure. Children with severe affects are often those children with fetal alcohol syndrome. Children with ADHD often show mild affects. These children often have difficulty generalizing and applying information to daily problem solving as well as show a weakness with visual motor integration tasks and visual perceptual skills. Visual sequencing may also be impaired. Finally, children exposed to drugs in utero often show problems with appropriate play. The emergence of symbolic play can be delayed with a lack in imitative play. These children do not demonstrate interactive behavior during play, use toys appropriately, transfer skills, or move from one activity to another while gaining experiential learning. Transitioning during these and other activities can be difficult. (Budden, 1996).

- **Language Development** – Below the age of 12 months, some infants lack spontaneous vocalization and babbling with a lack in imitative vocal play. Auditory responses in infants can also be affected. Stuttering, slurring, poor articulation, and oral dyspraxia can be present. Telegraphic speech or unconnected single words is common. In addition, problems with grammar, syntax, meaning, and a lacking in vocabulary can occur. Frequently, these children have difficulty following directions and have auditory language processing deficits. Frustration is a common behavior of these children with expressive and receptive language problems due to the inability to communicate needs and wants (Budden, 1996).

- **Social-Emotional Development** – The drug-exposed child is often hyperactive with a short attention span. They are prone to lose control easily, be withdrawn, have mood swings, and problems with transitions. These children can either go from one adult to another showing no preferences for a particular person or overreact to separation from their primary caregiver. Distractibility, unfocused play, inattention, and impulsivity often interfere with the child's ability to learn (Budden, 1996).

- **Adaptive Skills** – Because infants and children prenatally exposed to drugs often have motor, cognitive, and language delays, the child's self-help or adaptive skills may in turn be affected as well. These skills can include, but are not limited to, feeding, dressing, and toileting. Infants experiencing feeding problems due to oral motor difficulties can result in weight loss and failure to thrive. Children exposed prenatally to drugs often show maladaptive behavior hindering independence because the child requires more supervision and assistance in order to learn how to behave appropriately.

Intervention Strategies

Infants

Intervention strategies for infants must first and foremost include treatment for withdrawal and withdrawal symptoms, seizures, apnea, and malnutrition. Besides treating any apparent health conditions through medical intervention, caregivers can apply various techniques in a general plan of care that can be individualized depending upon the need of the child. These techniques include:

1. Provide a calm environment: low lighting, soft voices, and slow transition from one activity to another.
2. Be aware of signs of escalated behavior and frantic distress states before they occur, e.g., increased yawns, hiccoughs, sneezes, increased muscle tone and flailing, irritability, disorganized sucking, and crying.
3. Use calming and special care techniques on a regular basis, such as
    - swaddling blankets tightly around the infant
    - using a pacifier even when the infant is not organized enough to maintain a regular suck
    - rocking, holding, or placing the infant in a swing, or Snuggly™ carrier
    - massaging the child
    - bathing in a warm bath, followed by a soothing application of lotion
    - rubbing ointment on diaper area to prevent skin breakdown
4. Encourage developmental abilities when the infant is calm and receptive using only one stimulus at a time. Look for signs of infant distress and discontinue the activity if this occurs.
5. Gradually increase the amount and time of daily developmental activities; encourage the child to develop self-calming behaviors and self-control of his own body movements (ARCH Factsheet Number 49).

Neurodevelopmental therapy can also be used to help treat children. This approach to therapy is based on the premise that therapeutic intervention should take into account the child's present neurodevelopmental and functional skills and build upon those, rather than intervening at the stage of a typically developing child of the same age. Sensory-motor integration, facilitating normal balance and equilibrium, and inhibiting primitive reflexes are all part of neurodevelopmental therapy.

Judith Schaffer of the New York State Citizen's Coalition for Children recommends caregivers watch for overexcitement in the infants. Indications of overexcitement can be color change, eye aversions, sneezes, and other clues. Her other recommendations include:

- Swaddling and pacifiers
- Gentle "up and down" rocking as opposed to "side to side"
- Only play with baby when they seem ready to respond
- Because these babies tend to be more stiff, propping up at the sides may be necessary
- Jumpers and walkers are discouraged
- Massage for at least 30 minutes a day (Adamec and Pierce, 2000)

Children

Intervention strategies for children also need to be individualized to meet the specific needs of the child.

- **Feeding Problems** – Feed the baby more often; feed smaller amounts at one time; allow the infant to rest frequently during feeding. Place the infant upright for feeding; after feeding, place the child on his side or stomach to prevent choking; if vomiting occurs, clean the skin immediately to prevent irritation.
- **Irritability/unresponsive to caregiver** – Reduce noise in the environment; turn down lights; swaddle the infant: wrap snugly in a blanket with arms bound close to the body. Hold the infant closely; put the infant in a bunting-type wrapper and carry it close to your body. Rock the infant slowly and rhythmically, either horizontally or with its head supported vertically, whichever soothes. Place the child in a front-pack carrier; walk with the infant; offer the infant a pacifier or place it in an infant swing.
- **Goes from one adult to another, showing no preference for a particular adult** – Respond to specific needs of child with predictability and regularity.
- **May have poor inner controls/frequent temper tantrums** – Use books, pictures, doll play, and conversation to help the child explore and express a range of feelings.
- **Ignores verbal/gestural limit setting** – Talk the child through to the consequence of the action.
- **Shows decreased compliance with simple, routine commands** – Provide the child with explicitly consistent limits of behavior.
- **Exhibits tremors when stacking or reaching** – Observe the child and note the onset of tremors, their duration, and how the child compensates for them; provide a variety of materials to enhance development and refinement of small motor skills, e.g., blocks, stacking toys, large Leggos™, and puzzles with large pieces. Sand and water play are soothing and appropriate.
- **Unable to end or let go of preferred object or activity** – Provide attention and time to children who are behaving appropriately; provide child with an opportunity to take turns with peers and adults.
- **Delayed receptive and expressive language** – Create a stable environment where the child feels safe to express feelings, wants, and needs; use stories/records/songs; use hands-on activities to reinforce the child's language abilities.
- **Expresses wants, needs, and fears by having frequent temper tantrums** – Remove and help calm the child; redirect the child's attention; verbalize the expected behavior; reflect the child's feelings. Praise attempts toward adaptive behavior. Set consistent limits.
- **Difficulty with gross motor skills (e.g. swinging, climbing, throwing, catching, jumping, running, and balancing)** – Provide appropriate motor activities through play, songs, and equipment. Offer guidance, modeling, and verbal cues as needed.

- **Over-reacts to separation of primary caregiver** – Offer verbal reassurance; be consistent, and help the child learn to trust adults.
- **Withdraws and seems to daydream or not be there** – Provide opportunities for contact; move close to the child, make eye contact, use verbal reassurance; allow, identify, and react to the child's expressions of emotions.
- **Frequent temper tantrums** – Understand that a tantrum is usually a healthy release of rage and frustration; protect the child from harm; remove objects from the child's path if he is rolling on floor. Some children do not want to be held during a tantrum and doing so can cause more frustration. Remain calm, using a soothing voice; anger will only escalate the child's frustration. Do not shout or threaten to spank the child–the adult needs to be in control. Help the child to use words to describe emotions. Read stories about feelings. Help the child gain control by making eye contact, sitting next to the child, giving verbal reassurance, and offering physical comfort (rubbing back, etc.). Note the circumstances that provoked the tantrum, and try to avoid such confrontations when possible. Provide a neutral area for the child to work through the tantrum, (e.g., a large cushion or bean bag chair). Some children want to work through a tantrum alone; keep the child in sight, but do not interact until he is calm.

  (ARCH Factsheet Number 49)

Family

Diana Kronstadt, Ed.D., former director of the Early Education Project in Massachusetts and current consultant for perinatal substance abuse in California, offers several other intervention strategies to consider for the families of the drug-exposed infant/child:

- Training in parenting skills
- Having a basic knowledge and practical skills that match the needs of the child
- Creating a working partnership between the family and all service providers
- The child needs to bond or develop an attachment with at least one person who does not have to be parent

(Kronstadt, 1991)

It is vital that any caregiver for the drug exposed infant / child learn the care routine, control techniques, possible medical conditions, developmental patterns, and background of the child. Proper education will also assist in providing an understanding of the child's behavioral cues.

Other Factors

It is often difficult to determine the exact effect of a specific drug because polydrug use is very common among addicts. For example, illegal drugs are often combined with alcohol and cigarettes. This and the fact that illegal substances are seldom pure, makes it hard to determine which drug has been used, how much has been taken, when during the pregnancy was it taken, and which drug is producing the effect.

In addition, the socio-economic status of these women needs to be considered as well. Often times, these women have poor nutrition, increased infections or other medical problems. No prenatal care is also common and another factor that makes it even more difficult to determine if the effects were caused from the drug usage or simply an unhealthy environment.

Finally, children who remain with the birth mother are also at risk for abuse and neglect if the mother continues to use drugs. In a recent study, 56% of the participating mothers were back on the drug within a month after the child's birth (Adamec and Pierce, 2000).

Considerations for Families:

H.E.L.P. (Helping to Encourage Loving Parenting)
Macomb Family Services
Phone: 586-752-9696 (Romeo)
Parents of school children can take classes offered in northern Macomb County only. Topics include communication skills, reflective listening, how to talk to your child, ownership of feelings, stages of development, behavior management, family rules anger, and coping with stress. Classes run for ten weeks for 2 1/2 hours. $35 per person or $45 a couple. Free book and child care (if available).

More H.E.L.P.
Macomb Family Services
Phone: 586-752-9696
Classes focused on the needs of parents who grew up in dysfunctional families relating to alcohol or other drugs. Offered in northern Macomb County only, 2 1/2 hour classes for 10 weeks. Topics include adult child of alcoholic issues, parenting programs, adult/child stress cycles, addiction co-dependency, breaking ineffective life patterns, and family of origin work. Same fees as above

Parenting Classes for Non-Custodial Parents
Macomb Family Services
Phone: 586-468-2656
For parents who **do not** have current custody of children. Parenting class and therapeutic issues relating to abuse and neglect, designed to access and meet the educational needs of parents who do not currently have custody of their children. The program has a revolving 24-week curriculum specifically structured to address issues related to abuse and neglect. Sliding scale fee.

Support Group for Caregivers of Drug-Exposed Infants
Phone: 586-412-0033
Monthly support group for all caregivers of infants and children who were prenatally exposed to alcohol and/or other drugs.

MCFARES (Macomb County Fetal Alcohol Resource Education and Support)
Phone: 586-329-6722
www.mcfares.org
Resources, education and support for families living with Fetal Alcohol Spectrum Disorder.

NAR-ANON
Phone: (586) 447-2868
For family and close friends of drug abusers, 7:30-9:30 p.m. Sundays, St. John Hospital and Medical Center. 22101 Moross Road, at Mack Avenue, Detroit, (888) 757-5463.

Healthy Families Macomb – Judson Center
(586) 258-0002

Healthy Families Macomb -Spaulding for Children
(248) 443-0300
Families with children aged 0 - 3 at risk for child abuse and neglect. Intensive, in-home services provided by trained social workers including assessment, information and referral, case management, and child development and management issues.

Judson Center, Nurturing Program
(586) 258-0222
Home-based and group services for Macomb County parents with young children. The program is designed to reduce child abuse and neglect by promoting effective family communication, cooperation, closeness, and respect. Practical techniques for handling challenging behaviors and situations, and using non-violent, nurturing parenting skills are taught.

CARE of Macomb
(586) 541-0033
Case managers may visit clients in their current living environment (if it is safe, etc.) to assess needs and provide case management services. Afterwards, intensive case management and supportive services to achieve a successful outcome, and provide after-care support to maintain recovery following completion of substance abuse treatment are available.

Child Care Emotional Protection
Program, (586) 466-6912
Home visits, coaching and training, onsite observation, lending library, developmental assessments, positive behavior support, referrals to community services.

Families Anonymous- SE Michigan Intergroup:
Call (248) 435-2027 or visit www.familiesanonymous.org for a meeting near you.
Self-help & 12 Step groups for families coping with a drug/alcohol and behavioral problems in the family.

Baby Steps: Caring for Babies with Prenatal Substance Exposure (December 2003)
Ministry of Children and Family Development, British Columbia
Information in this guide focuses on the daily care of babies aged birth to 6 months of age who have been exposed to substances in the womb. This caregiver guide is intended to be a hands-on resource for parents and caregivers of babies who have been prenatally exposed to alcohol and other drugs. Information for the handbook was gathered from various sources, including parents, caregivers, professionals and published books and articles.
http://www.aidp.bc.ca/babysteps.pdf

Caring for Drug Exposed Infants
Pediatric Interim Care Center, The Newborn Nursery
This web site has been designed to help caregivers in identifying the signs and symptoms of a drug exposed infant and to provide effective comforting and assisting techniques. These techniques have been developed by Barbara Drennen from the Pediatric Interim Care Center.
http://www.drugexposedinfants.com

Books:

Living with Prenatal Drug Exposure: A Guide for Parents
By Lissa Cowan and Jennifer Lee | Researched and developed by Emilie Cameron

Name of Drug	FDA Risk Factor	Possible Problems	What You Need to Know
A. Antihistamines			
Allegra (fexofenadine)	C	Reports of use during pregnancy are not available.	Product too new to evaluate. Use over-the-counter product like chlorpheniramine if treatment necessary.
Claritin (loratidine), Zyrtec (ceftrizine)	B	Reports of use during pregnancy are not available.	Product too new to evaluate. Use over-the-counter product like chlorpheniramine if treatment necessary.
Hismanal (astemizole)	C	Limited reports of use in pregnancy available.	Product too new to evaluate. Use over-the-counter product like chlorpheniramine if treatment necessary.
B. Antibiotics/Anti-infectives			
1. Antifungals			
Terrazol (terconazole)	C	No known link to birth defects.	Use as directed by your physician for vulvo-vaginal yeast infections.
Diflucan (fluconazole)	C	Possible birth defects with continuous use at higher doses.	Should be avoided in pregnancy, if possible.
Fulvicin (griseofulvin)	C	May be associated with conjoined twins.	Avoid.
Mycostatin (nystatin) oral or cream	B	Doesn't appear to be linked to birth defects.	A possible alternative to terconazole.
2. Antimalarials			
Aralen (chloroquine)	C	May be responsible for various birth defects. Research inconclusive.	A safer alternative than quinine.
Paludrine (proguanil)	B	Doesn't appear to be linked to birth defects.	May be best choice for malaria prophylaxis in pregnancy.
Quinine	D	Possible birth defects.	Use alternatives if possible.
3. Antimalarials			
Isoniazid (INH)	C	Toxic in animal embryos; may cause neurological abnormalities.	Use only as directed by your physician.

Myambutol (ethambutol)	B	Doesn't appear to be linked to birth defects.	Use only as directed by your physician.
Rifampin (antituberculosis)	C	Possible increase in fetal anomalies.	Use only as directed by your physician.
4. Antivirals			
Famvir (famciclovir)	B	Reports of use during pregnancy are not available.	For treatment of genital herpes. Avoid use during pregnancy, if possible.
Retrovir (zidovudine-AZT)	C	Doesn't appear to be linked to birth defects.	Effective in preventing maternal-fetal transmission of HIV.
Valtrex (valcyclovir)	B	Reports of use during pregnancy are not available.	For treatment of genital herpes. Avoid use during pregnancy, if possible.
Zovirax (acyclovir)	B	Reports of use during pregnancy are not available.	For treatment of genital herpes. Avoid use during pregnancy, if possible. Recent evidence suggests it may be warranted in certain situations.
5. Cephalosporins			
Keflex (cephalexin), Ceclor(cefaclor), Duricef (cefadroxil), Suprax (cefixime)	B	Doesn't appear to be linked to birth defects.	Use only as directed by your physician.
6. Quinolones			
Cipro (ciprofloxacin) Floxin (ofloxacin)	C	Doesn't appear to be linked to birth defects.	Should be avoided in pregnancy unless no safer alternatives exist.
NegGram (nalidixic acid)	C	Causes birth defects in animals.	Should be avoided in pregnancy unless no safer alternatives exist.
Noroxin (norfloxacin)	C	May be associated with birth defects.	Should be avoided in pregnancy unless no safer alternatives exist.
7. Penicillins			
Amoxicillin, ampicillin, cloxacillin, dicloxacillin, penicillin	B		Use only as directed by your physician.

8. Sulfonamides (Sulfa Drugs)			
Bactrim, Septra (sulfamethoxazole)	B	May be associated with birth defects. Not confirmed. If administered near term, may cause neonatal jaundice.	Use only as directed by your physician.
9. Antitrichomonas			
Flagyl, Protostat (metronidazole)	B	Controversy regarding safety during pregnancy.	Should be avoided in first trimester and used only if absolutely necessary in second and third trimesters.
10. Urinary Antibiotics			
Macrodantin/Macrobid (nitrofurantoin)	B	Doesn't appear to be linked to birth defects.	Avoid using near term or with suspected G6PD deficiency (a genetic disorder that weakens red blood cells).
Monurol (fosfomycin)	B	Reports of use during pregnancy are not available.	Taken as a single dose.
11. Scabicides/Pediculocides (Anti-lice and Scabies)			
Kwell (lindane shampoo)	B	May be associated with nerve damage and anemia.	Use pyrethrins with piperonyl butoxide for lice infestations in pregnancy. See over-the-counter medication chart.
12. Other			
Augmentin (clavulonate/amoxicillin)	B	May be associated with spina bifida. Not confirmed.	Use only as directed by your physician.
Betadine (povidone—iodine)	D	Prolonged use or use near term may cause fetal thyroid disorder.	Use only as directed by your physician.
Betasept, Hibiclens (chlorhexidine gluconate)	B	Doesn't appear to be linked to birth defects.	Used as a presurgical skin cleanser.
Biaxin (clarithromycin)	B	Doesn't appear to be linked to birth defects.	Related to erythromycin, but newer.
Cleocin (clindamycin)	B	Doesn't appear to be linked to birth defects.	Use only as directed by your physician.
Erythromycin	B	Doesn't appear to be linked to birth defects. Possible maternal liver toxicity with certain forms	Preferred drug in pregnancy for chlamydia.

pHisoHex (hexachlorophene)	C	Causes birth defects in animals in high doses.	Avoid in pregnancy, especially on mucous membranes or injured skin.
Vibramycin, Doryx (doxycycline), Minocin (minocycline), tetracycline	D	May cause various birth defects, tooth discoloration, and possible bone damage.	Avoid during pregnancy.
Zithromax (azithromycin)	B	Doesn't appear to be linked to birth defects.	Related to erythromycin, but newer.
C. Antilipemics (Cholesterol-Lowering Drugs)			
Lipitor (atorvastatin), Mevacor (lovastatin), Lescol (fluvastatin), Pravachol (pravastatin), Zocor (simvastatin)	X	Theoretically toxic to fetal development.	Do not use during or prior to pregnancy.
Lopid (gemfibrozil)	C	May be associated with birth defects.	Rarely necessary during pregnancy.
Questran (cholestyramine), Colestid (colestipol)	B	Doesn't appear to be linked to birth defects.	Has limited use during pregnancy.
D. Cancer Drugs			
Adriamycin (doxorubicin), fluorouracil, methotrexate, Cytoxan (cyclophosphamide), Idamycin (idarubicin), Novantrone (mitoxantrone), Oncovin (vincristine),	D	Highly toxic. Multiple birth defects, neonatal bone-marrow suppression, and intrauterine growth restriction.	Benefits must clearly outweigh the risks. Occupational exposure to these agents by pregnant women is potentially toxic in the first trimester.

Platinol (cisplatin), Vesanoid (tretinoin Oral)			
Novadex (tamoxifen)	D	Toxic in animal studies. Possibly carcinogenic as well.	Avoid in pregnancy and for at least two months before conceiving.
E. Muscle Relaxants			
Flexeril (cyclobenzaprine)	B		Use only as directed by your physician.
Parafon Forte (chlorzoxazone), Robaxin (methocarbamol), Norflex (orphenadrine)	C	Doesn't appear to be linked to birth defects.	Avoid during pregnancy.
F. Cardiovascular Drugs			
1. Angiotensin-Converting Enzyme Inhibitors (ACE Inhibitors)			
Capoten (captopril), Vasotec (enalopril), Zestril (lisinopril)	D	Toxic to fetus. Causes birth defects even in second and third trimesters.	Avoid during pregnancy.
2. Antihypertensives (Blood Pressure Medications)			
Aldomet (methyldopa)	C	Doesn't appear to be linked to birth defects.	Discuss switching from your current antihypertensive to methyldopa or labetalol with your caregiver.
Inderal (propranolol)	C	Decreased heart rate, low blood sugar, possible growth restriction.	Consider switching to methyldopa or labetalol.
Lopressor (metoprolol)	C	First-trimester reports lacking; mild neonatal hypotension and decreased heart rate a possibility.	Consider switching to methyldopa or labetalol.
Normodyne (labetalol)	C	First-trimester reports lacking; mild neonatal hypotension and decreased heart rate a possibility.	Preferred to methyldopa by some maternal-fetal medicine specialists.

Tenormin (atenolol)	C	May be associated with birth defects.	Consider switching to methyldopa or labetalol.
3. Calcium Channel Blockers			
Calan (verapaml), Norvasc (amlopidine), Procardia (nifedipine)	C	Not proven to be safe during pregnancy. Possible temporary fetal/neonatal cardiovascular functional abnormalities.	Consult your cardiologist.
4. Cardiac Drugs			
Lanoxin (digoxin)	C	Maternal overdose may be toxic to developing baby.	Consult your cardiologist.
5. Vasodilators			
Nitroglycerin	B	Doesn't appear to be linked to birth defects.	Also used for treatment of excessive uterine contractions/premature labor.
G. Central Nervous System (CNS) Drugs			
1. Analgesics (Pain Relievers)			
Darvon, Darvocet (propoxyphene)	C D	May be associated with multiple birth defects. Not confirmed. Neonatal withdrawal symptoms if used for prolonged periods.	Narcotic analgesics are generally preferred for occasional use in pregnancy when acetominophen is not effective.
2. Anticonvulsants (Epilepsy Drugs)			
Depakene (valproic acid), Depakote (sodium valproate)	D	High incidence of cranial, facial, and limb defects, including cleft lip and palate, and underdeveloped fingers. Impaired physical and mental development, congenital heart defects.	Untreated epilepsy poses a greater risk than valproic acid. The minimum effective dosage should be used.

Dilantin (phenytoin, diphenylhydantoin)	D	Fetal Dilantin syndrome. (High incidence (2%-26%) of cranial, facial, and limb defects, including cleft lip and palate, and underdeveloped fingers. Impaired physical and mental development, congenital heart defects.	Untreated epilepsy poses a greater risk than phenytoin. The minimum effective dosage should be used.
Tegretol (carbamazepine)	C	Possible birth defects.	Preferred drug for grand mal seizures. Discuss medication strategy with your neurologist.
Zarontin (ethosuximide)	C	Possible birth defects.	Preferred drug for petit mal epilepsy, especially during first trimester.
3. Antidepressants			
Effexor (venlafaxine)	C	Limited reports of use during pregnancy available	Unrelated to other antidepressants.
Luvox (fluvoxamine)	C	Reports of use during pregnancy are not available.	A selective seritonin re-uptake inhibitor (SSRI) used to treat obsessive-compulsive disorder (OCD).
Paxil (paroxetine)	B	Limited reports of use during pregnancy available.	An SSRI.
Prozac (fluoxetine)	B	Limited reports of use during pregnancy available.	Because there is longer follow-up data for this drug than for newer SSRIs, this is probably the best choice of antidepressant for use during pregnancy.
Remeron (mirtazapine)	C	Reports of use during pregnancy are not available.	A tetracyclic antidepressant chemically unrelated to tricyclics, SSRIs, and monamine oxidase (MAO) inhibitors.
Serzone (nefazodone)	C	Reports of use during pregnancy are not available.	An SSRI.
Sinequan (doxepin)	C	May be associated with birth defects.	When antidepressants are needed in pregnancy, the SSRI drugs appear to be the safest.
Tricyclics including Elavil (amitriptyline),	D	Possible facial, head, limb and central nervous system defects;	Avoid in pregnancy if possible.

Surmontil (trimipramine), Tofranil (imipramine)		possible neonatal withdrawal symptoms.	
Wellbutrin (bupropion)	B	Reports of use during pregnancy are not available.	Mechanism of action unrelated to other antidepressants.
Zoloft (sertraline)	B	Reports of use during pregnancy are not available.	An SSRI.
4. Narcotic Analgesics			
Codeine	C D	May be associated with multiple birth defects. Not confirmed. If used for prolonged periods or in high doses at term.	Use only as directed by your physician.
Dilaudid (hydromorphone), OxyContin, Percodan, Tylox, (oxycodone), Synalgos-DC (dihydrocodeine), Vicodin, Lortab (hydrocodone)	B D	Reports of use during pregnancy are not available. If used for prolonged periods or in high doses at term.	Use only as directed by your physician.
Demerol (meperidine)	B D	May be associated with hernias. If used for prolonged periods or in high doses near term, baby may experience withdrawal, respiratory depression, growth restriction and neonatal death.	Use only as directed by your physician.

Heroin (diacetylmorphine)	B D	Possible chromosome damage. If used for prolonged periods or in high doses near term, baby may experience withdrawal, respiratory depression, growth restriction, lagging intellectual development and neonatal death.	Do not use during pregnancy.
Methadone	B D	If used for prolonged periods or in high doses near term, baby may experience withdrawal, respiratory depression, growth restriction, and neonatal death.	Use only as directed for treatment of narcotic addiction.
Morphine	B D	May be associated with hernias. If used for prolonged periods or in high doses near term, baby may experience withdrawal, respiratory depression, growth restriction, and neonatal death.	Use only as directed by your physician.
Talwin (pentazocine)	B D	If used for prolonged periods or in high doses near term, baby may experience withdrawal, respiratory depression, growth restriction, and neonatal death.	Use only as directed by your physician.
Ultram (tramadol)	C	Possibly toxic in animals at high doses-related to codeine but not addictive.	Too new to recommend over traditional narcotic pain-relievers.
5. Nonsteroidal Anti-inflammatory Drugs (NSAIDs)			
Anaprox (naproxen)	B	Doesn't appear to be linked to birth defects.	Should not be used by women trying to conceive. May impair implantation.

Ansaid (flurbiprofen), Clinoril (sulindac), Motrin (ibuprofen), Ponstel (mefenamic acid), Voltaren (diclofenac)	D	If used during the third trimester or near delivery, this drug can cause neonatal pulmonary hypertension.	Should not be used by women trying to conceive. May impair implantation.
Relafen (nabumetone), Daypro (oxaprozin)	C D	Doesn't appear to be linked to birth defects. If used during the third trimester or near delivery, this drug can cause neonatal pulmonary hypertension.	Should not be used by women trying to conceive. May impair implantation.
6. Sedatives and Hypnotics			
Ambien (zolpidem)	B	Reports of use during pregnancy are not available.	Relatively new, so if sleeping pill is absolutely needed, most doctors will prescribe a barbiturate, narcotic, or antihistamine for occasional use only.
Benzodiazepines such as Valium (diazepam), Xanax (alprazolam), Klonipin (clonazepam) Ativan (lorazepam)	D	Possible birth defects, neonatal depression, "floppy baby" syndrome, neonatal withdrawal.	Avoid, especially in first trimester. Severe panic disorders may need to be treated in the second and third trimesters.
7. Stimulants/Appetite Suppresants			
Fastin, Adipex-P (phentermine)	C	May be associated with stillbirth.	Avoid during pregnancy and preconceptionally.
Meridia (sibutramine)	C	Causes birth defects in animals at higher doses.	Avoid during pregnancy.

8. Tranquilizers			
Lithium	D	Possible changes in newborn heart rhythms and thyroid function; possible goiter, jaundice, electrolyte imbalance. Possible birth defects, especially of the heart.	Avoid during pregnancy.
Phenothiazines such as Trilafon (perphenazine), Compazine (prochlorperazine), Fluphenazine	C	Research regarding birth defects is inconclusive. Possible neurological effects on fetus when taken close to term.	Avoid using these drugs near term. It may be safe to use some of these drugs for the treatment of severe nausea and vomiting in the first trimester.
H. Anticoagulants (Blood Thinners)			
Coumadin (warfarin)	D	High incidence of birth defects (for example, "Fetal warfarin syndrome"); may lead to fetal hemorrhage or death.	Do not use these drugs during pregnancy. Heparin is the drug of choice when anticoagulation is necessary.
Heparin	C	Fetal and maternal complications possible with prolonged use.	Generally preferable to Coumadin (warfarin) when anticoagulation is needed in pregnancy.
I. Diuretics			
Lasix (furosemide)	C	Possible electrolyte imbalance, increased fetal urine output.	Should be used only in cases of severe hypertension and other cardiovascular disorders.
Thiazides such as Dyazide, Maxzide, Aldactazide (hydrochlorthiazide), Diuril (chlorothiazide)	D	Bone-marrow depression, possible birth defects, decreased platelet count (poor blood clotting), electrolyte imbalance.	Should be used only in cases of severe hypertension and other cardiovascular disorders.

J. Gastrointestinal Drugs			
1. Antidiarrheal			
Immodium (loperamide)	B	Doesn't appear to be linked to birth defects.	Use only as directed by your physician.
Lomotil (diphenoxylate)	C	Doesn't appear to be linked to birth defects.	Related to narcotic meperidine. (Demerol).
2. Anti-emetics (Antinausea)			
Phenergan (promethazine), Tigan (trimethobenzamide), Compazine (prochlorperazine)	C	Doesn't appear to be linked to birth defects. Frequent use in later part of pregnancy may be associated with neonatal jaundice, depression and withdrawal symptoms.	An option for severe morning sickness (hyperemesis gravidarum).
Reglan (metoclopramide)	B	Doesn't appear to be linked to birth defects.	Also used when needed to stimulate breast milk production in nursing mothers.
3. Antisecretory Drugs			
Cytotec (misoprostil)	X	Causes miscarriage and birth defects.	Do not use during pregnancy.
Pepcid (famotidine)	B	Reports of use during pregnancy are not available.	Use only as directed by your physician.
Prilosec (omeprazole)	C	No birth defects in animals, but effects unclear in humans.	Avoid during pregnancy, especially prior to week 20.
Prevacid (lansoprazole)	B	Reports of use during pregnancy are not available.	Structurally similar to omeprazole. Avoid during pregnancy, especially prior to week 20.
Zantac (ranitidine)	B	Doesn't appear to be linked to birth defects.	Use only as directed by your physician.
K. Hormones			
1. Adrenal			
Cortisone, Hydrocortisone (forms other than topical)	D	Possible birth defects. Possible neonatal adrenal suppression and electrolyte imbalance.	Switch to prednisone if necessary.

Dexamethasone	C	Birth defects in animals; no observed birth defects in humans. Possible neonatal adrenal suppression and electrolyte imbalance.	Switch to prednisone if necessary.
Prednisone	B	Doesn't appear to be linked to birth defects. Possible neonatal adrenal suppression and electrolyte imbalance.	Preferred adrenal steroid during pregnancy. Should be used instead of other corticosteroids whenever possible.
2. Antidiabetic Drugs			
Diabinase (chlorpropamide)	D	Suspected birth defects, low blood sugar, fetal death.	Change to insulin if your diabetes cannot be controlled by diet alone.
Glucophage (metformin)	B	Appears to be the safest of the oral diabetes drugs.	Though insulin is the drug of choice for the treatment of diabetes during pregnancy, this drug may be preferred for women of childbearing age who are not planning a pregnancy.
Glucotrol (glipizide)	C	Doesn't appear to be linked to birth defects.	Change to insulin if your diabetes cannot be controlled by diet alone.
Glynase (glyburide)	D	Possible birth defects with first trimester use.	Change to insulin if your diabetes cannot be controlled by diet alone.
Insulin	B	Low blood sugar. Maternal insulin shock can result in fetal death.	Your dose may have to be adjusted during pregnancy. Consult your physician.
Orinase (tolbutamide)	D	Possible birth defects, low fetal platelet count, low blood sugar, fetal death.	Change to insulin if your diabetes cannot be controlled by diet alone.
3. Antiprogesterone Drugs			
RU486 (mifepristone)	X	Causes abortion.	Do not use during pregnancy.
4. Antithyroid			
Propylthiouracil (PTU), Tapazole (methimazole)	D	May cause various birth defects and fetal/neonatal hypothyroidism.	PTU is the drug of choice for treatment of hyperthyroidism during pregnancy.
Radioactive Iodine	X	Causes birth defects.	Do not use during pregnancy.

5. Estrogens			
Clomid, Serophene(clomiphene)	X	Though rated X by manufacturer, no birth defects are proven.	A fertility drug. Should be used only after possibility of pregnancy has been ruled out.
DES (diethylstilbestrol)	X	Reproductive organ defects and future reproductive problems.	Should not be used during pregnancy.
Oral contraceptives including the morning-after pill (contain estrogen and/or progestogen)	X	Possible genital anomalies like with DES. Possible advanced neonatal bone age with resulting short stature.	Stop taking your oral contraceptives as soon as pregnancy is confirmed. (You should take a pregnancy test as soon as possible if you suspect that you may be pregnant.)
6. Progestogens			
Crinone, Prometrium, Micronized progesterone (progesterone)	Not Rated	No animal reports and Doesn't appear to be linked to birth defects.	Used for the treatment of infertility, luteal phase deficiency, and assisted reproductive technologies in first 10 weeks of pregnancy.
Provera (medroxyprogesterone)	D	Possible birth defects.	When used to treat abnormalities or absence of menstruation, pregnancy must be ruled out first.
7. Thyroid			
Synthroid (levothyroxine), Armour thyroid (thyroid hormones)	A	No adverse effects with appropriate doses.	Use only as directed by your physician. Dose may need to be adjusted during pregnancy.
L. Asthma Drugs-Bronchodilators			
1. Sympthomimetics			
Alupent (metaproterenol), Max air (pirbuterol), Ventolin, Proventil (albuterol), Serevent (salmeterol)	C	No apparent link to birth defects in normal inhaled doses.	Generally available as inhalers. Use as directed by your physician in minimum effective doses.
2. Antispasmodics			
Aminophyllin, TheoDur (theophyllin)	C	May be associated with birth defects.	One of a number of acceptable treatments for chronic asthma during pregnancy.

M. Other			
1. Acne			
Accutane (isotretinoin)	X	Increased risk of miscarriage and birth defects.	Stop using the drug at least one month prior to attempting pregnancy.
Retin-A (tretinoin)	C	No proven adverse effects when used topically.	Not to be confused with Accutane (above) or cancer drug Vesanoid (tretinoin oral).
2. Antimigraine			
Amerge (naratriptan)	C	Possibly toxic in animals at higher doses.	Limited reports in human pregnancy-avoid in pregnancy.
Imitrex (sumatriptan)	C	No apparent link to birth defects, but data lacking. Possible increase in risk of miscarriage.	Avoid in pregnancy.
Midrin (isometheptene)	C	Reports of use during pregnancy are not available.	Use only as directed by your physician.
3. Urinary Tract Antispasmodics			
Cystospaz (flavoxate)	B	Reports of use during pregnancy are not available.	Avoid in pregnancy.
Detrol (tolterodine tartrate)	C	Possibly toxic in animal pregnancies at high doses.	Avoid in pregnancy.
Ditropan (oxybutynin)	B	Reports of use during pregnancy are not available.	Avoid in pregnancy.
Urospaz (l-hyoscyamine)	C	May be associated with birth defects.	Avoid in pregnancy.
4. Weight Loss/Fat Blocking			
Xenical (orlistat)	B	Reports of use during pregnancy are	Avoid in pregnancy.

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