

Educational Toolkit: Perinatal Drug Exposure Resources

Developed for Patients and Providers

Northern Arizona Healthcare in collaboration with the 2017 Arizona Substance Abuse Task Force and the Arizona Statewide Task Force on Preventing Prenatal Exposure to Alcohol and Other Drugs have developed this toolkit to be disseminated across Arizona to healthcare providers and patients.

www.azprenatal.wixsite.com/taskforce



Educational Toolkit: Perinatal Drug Exposure Resources

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Basics of Sensitive Baby-Care

A baby in withdrawal is sensitive — and requires sensitive care. The clinical term for a baby in withdrawal is Neonatal Abstinence Syndrome (NAS). This handout describes how you can provide sensitive care in the hospital and at home. It offers ideas for responding to specific symptoms you may see in your newborn. These strategies also promote bonding and help you and baby engage, learn, and enjoy. Keep in mind that a big part of sensitive care is learning your baby's cues for comfort and needs.

“Cues” are certain behaviors that you can learn to interpret. They can include things like crying, smiling, arching the back, staring, and turning the head. It may help to write down your baby's cues and how you respond to help your baby feed well, settle down, rest, grow, and engage.

It is important to understand Neonatal Abstinence Syndrome (NAS)

- Signs and symptoms can be different for every baby with NAH. Most of the symptoms of NAS will appear in about 3 days of birth. However, some symptoms can start right after birth or can take a few weeks to start. Signs and symptoms you might see are:
 - Body shakes (tremors), seizures (convulsions), twitching (overactive reflexes), and tight muscles
 - Fussiness, excessive crying or crying that is high-pitched
 - Not eating well, not sucking on the bottle nipple or breast well, or not gaining weight very well
 - Breathing really fast
 - Fever, sweating, or blotchy (red) spots on the skin
 - Trouble sleeping and lots of yawning
 - Diarrhea or throwing up
 - Stuffy nose or sneezing
- Not all babies with NAS have the same symptoms. Symptoms will depend on:
 - What drug you took during pregnancy
 - How much of the drug you were prescribed or took during your pregnancy
 - How many times you took drugs during your pregnancy
 - How your body breaks down (metabolizes) the drug
 - If your baby came early, before 37 weeks of pregnancy
- NAS can last from 1 week to 6 months after your baby is born

In the hospital give your baby the following:

- **Closeness.**
 - Spend as much time as possible with your newborn. Your touch, voice, and presence are familiar and reassuring.
 - Hold your baby skin-to-skin. This closeness comforts your baby and may ease some symptoms of withdrawal. It's also a wonderful and gentle way to get to know each other.
 - You should breastfeed if it is recommended and approved by your baby's provider
 - It is important you are present to provide care to your baby. You are the best treatment for your baby. The Neonatal Intensive Care Unit (NICU)

team will give teach you on how to care for your baby. The NICU team will also help you get the right support while you learn to care for your baby.

- **Quiet, calm, and consistency.**
 - Limit visitors. Your baby will do better with fewer people and less stimulation.
 - Keep things quiet. Voices and music need to be soft. Cell phones should be on vibrate.
 - Avoid too much of anything: bright lights, hot and cold, lots of “fun” toys or games. A baby in withdrawal needs rest, not excitement. Save the peek-a-boo surprises for later.
 - Learn your baby’s cues. Your baby will feel reassured when you are consistent with feedings, naps, and cuddles. If you are able to breastfeed, learning your baby’s feeding cues will help you breastfeed on demand, providing both nourishment and comfort to your baby.
- **While your baby’s being treated for NAS, he may be fussy and hard to soothe.** Doing these things can help calm him:
 - It is very important that you spend time with your baby during their hospital stay.
 - Swaddle your baby in a blanket.
 - Give your baby skin-to-skin care (also called kangaroo care). It’s when you put your baby, dressed only in a diaper, on your bare chest.
 - Your baby’s nurses and neonatal therapists can show you calming techniques for your baby, and you can show them things you learn that help your baby so they can do the same thing when you are not available, or when you have taken a break.
 - Utilize approved soothing strategies, for example:
 - The 5 S’s: Swaddle, suck, sway, shush, and, sidelying or stomach (positioning to hold infant) The nursing staff and Neonatal therapists can review this with you
 - Keep your baby in a quiet, dimly lit room.
 - Breastfeed your baby if you are able. The team will discuss with you if it is appropriate.
 - As stated, a symptom of NAS is poor feeding, sucking, or weight gain. A Neonatal Occupational Therapist can serve as a resource when beginning to feed infant (breast or bottle)
- **Patience and attention.**
 - Notice your baby’s behaviors and cues. Understanding your baby’s cues can help you better understand your baby’s needs.
 - Some common cues that let you know that your baby is getting stressed include:
 - Crying
 - Arching his or her back
 - Hiccups, sneezing, or yawning
 - Turn his or her head away
 - Write down what you observe. You may want to discuss some things with your baby’s doctor or hospital staff.

- Be responsive. You and your newborn are beginning a lifelong conversation. As you learn your baby's ways of communicating, you're also finding your voice — your way of responding to what your baby is saying to you.
 - Be patient with your baby — and with yourself. The newborn period can be intense, and withdrawal can pose an additional challenge. Reach out for support as you and your baby move through this process together.
 - Have a backup plan. There will be times when you need a break yourself but the baby needs comfort. Knowing ahead of time who can relieve you will make it easier for you to take care of yourself and your baby.
- **Comfort positions and pressures.**
 - Try different ways of holding your baby. A baby may feel more secure and comfortable held over your shoulder, curled in a C-shape, or with his side or tummy along your thighs as you sit.
 - Experiment with massage and touch. Many babies are soothed by firm, rhythmic strokes and pats. Try patting your baby's back and bottom as you walk, sway, or rock. (Avoid light, feathery touch — this irritates many babies.)
 - Many hospitals have Developmental Specialists, Neonatal Specialists, and nurses who can teach you how to massage your baby, ways to soothe your baby, and positions that will work well for you and your baby.

When you are home:

- **Closeness.**
 - Sleep in the same room with your baby (**not in the same bed**). This makes it easier to check on your baby and to respond to your baby's needs. Always put your baby to sleep on his or her back, on a firm mattress. Keep the room at a temperature that's comfortable for you — that's the right temperature for baby, too.
 - Hold your baby skin-to-skin, during breastfeeding or any time. This closeness comforts your baby and may ease some symptoms of withdrawal. It's also a wonderful and gentle way to get to know each other.
- **Quiet, calm, and consistency.**
 - Limit visitors. Your baby will do better with fewer people and less stimulation.
 - Keep things quiet. Voices and music should be soft. Cellphones should be soothing and low or set on vibrate.
 - Avoid too much of anything: bright lights, heat and cold, lots of "fun" toys or games. A baby in withdrawal needs rest, not excitement. Save the peek-a-boo surprises for later.
- **Patience and attention.**
 - Keep practicing what you learned about your baby during your hospital stay.

- Be patient with your baby — and with yourself. The newborn period can be intense, and withdrawal can pose an additional challenge. Reach out for support as you and your baby move through this process together.
- Know when you need a break and have someone you trust as backup when you need relief but the baby needs comfort.
- **Comfort positions and pressures.**
 - Keep practicing what you learned about your baby during your hospital stay.
 - Use the positions of comfort you found during your hospital stay.
 - Continue to use massage and touch.

References:

<https://intermountainhealthcare.org/ext/Dcmnt?ncid=522597150>

Cocaine and Your Baby

Is there any safe amount of cocaine I can use during pregnancy?

No. Researchers have not figured out just how much cocaine it takes to cause birth defects and other problems for an exposed baby. Cocaine should not be used at any time during pregnancy. If you are having hard time quitting cocaine we have included some helpful agencies below.

When I use cocaine, does it get into my baby's body too?

Yes. Cocaine crosses the placenta and enters the baby's blood. Cocaine can be found in the urine, meconium (stool), umbilical cord and hair of an exposed newborn. Cocaine is cleared more slowly in the fetus and newborn than in an adult. Because of this, the cocaine stays in the baby's body for a longer period of time.

How long does cocaine stay in the body?

Cocaine and its breakdown products can be found for 30 hours in the urine of the pregnant woman, and for 2 to 7 days in the newborn after the drug is used.

I have heard that cocaine can cause a miscarriage. Is this true?

Yes. During the first months of pregnancy, cocaine exposure may increase the risk for miscarriage. Later in pregnancy, cocaine use can cause the placenta to separate from the wall of the uterus before labor begins. This condition, called placental abruption, can lead to heavy bleeding and can be fatal for both the mother and baby. Cocaine may also increase the risk for premature delivery.

Does cocaine cause birth defects?

Studies do not agree as to whether cocaine causes birth defects. Birth defects that have been reported with maternal cocaine use include abnormalities of the brain, skull, face, eyes, heart, limbs, intestines, genitals, and urinary tract. Most babies exposed to cocaine during pregnancy do not have a birth defect. The risk for a birth defect may be greater when the mother has used cocaine often during the pregnancy.

Can cocaine cause other problems for the baby?

Yes. Cocaine-exposed infants, especially those exposed near birth, have been found to be more irritable, jittery, and have interrupted sleep patterns, visual disturbances, feeding problems, and problems with sensory stimulation. Some of these complications may last 8 to 10 weeks after birth or even longer.

Cocaine can cause significant central nervous system problems that may not be seen until the child is older.

These effects may include problems with sustained attention and behavioral self-control, like increased aggression.

Delays in learning, abnormal muscle tone, slower growth rate, language difficulties and an increased need for special education in school-aged children have been reported.

Where can I find more help and support?

<http://mothertobaby.org>:

Mothertobaby help line: 1-866-626-6847 or text 1-855-999-3525

[National Council on Alcoholism and Drug Dependence](https://www.ncadd.org/)
<https://www.ncadd.org/>

Hope Line: **1-800-622-2255**

[Substance Abuse Treatment Facility Locator](https://findtreatment.samhsa.gov/)
<https://findtreatment.samhsa.gov/>

SAMHSA's National Helpline (also known as the Treatment Referral Routing Service) is a confidential, free, 24-hour-a-day, 365-day-a-year, information service, in English and Spanish, for individuals and family members facing mental and/or substance use disorders. This service provides referrals to local treatment facilities, support groups, and community-based organizations. Callers can also order free publications and other information.

Call **1-800-662-HELP (4357)** or visit the <https://findtreatment.samhsa.gov/>. The service is open 24/7, 365 days a year.

References:

<https://mothertobaby.org/fact-sheets/cocaine-pregnancy/pdf/>

Ecstasy and Your Baby

What is ecstasy?

Ecstasy or 3,4 methylenedioxymethamphetamine (MDMA), is a man-made drug that is similar to methamphetamine but also causes users to have hallucinations. Some common street names for MDMA are Ecstasy, Molly, Adam, XTC, X, California Sunrise, Scooby Snacks, hug drug, beans, and love drug.

When I use ecstasy does it get into my baby's body too? What happens when I use ecstasy during pregnancy?

When pregnant women use MDMA or Ecstasy, it passes from her bloodstream, through the placenta, and into the baby's bloodstream.

Ecstasy can cause your heart rate and blood pressure to increase. Ecstasy can make your body temperature get too high. Ecstasy can also have bad effects on your mind such as depression, confusion, sleeping problems, and severe anxiety. Ecstasy can be addictive. Some people have withdrawal symptoms when they stop using ecstasy. These symptoms include fatigue, loss of appetite, depression, and problems with concentration.

How long does ecstasy stay in the body?

Ecstasy can stay in your body for up to three days. The exact amount of time it is in your system can be different based on your body. If you have problems with your liver or took any other drugs or alcohol when you took ecstasy, it can stay in your body longer. Also, your age, your weight, your metabolism, and any other drugs that were mixed in with the ecstasy can make it stay in your body longer.

Does ecstasy cause birth defects or other problems for my baby?

Exposing a baby to Ecstasy during pregnancy can lead to a number of potential problems for babies including:

- Altered brain development in the first trimester of pregnancy
- Changes in newborn behavior related to this alteration
- Delayed development of normal motor function (coordinated muscle movement) in the middle and latter stages of pregnancy
- Heart defects in the newborn
- Club Foot
- Developmental and brain development delays for the first year of life

What can you do?

- Ecstasy should be avoided.
- Always tell your doctor if you have used Ecstasy.
- Follow medical advice regarding developmental follow-up for your baby.

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References:

<http://www.drugaddictiontreatment.com/types-of-addiction/designer-drugs/effects-of-mdma-ecstasy-use-during-pregnancy/>
<http://ecstasy.org/info/pregnancy.html>

Heroin and Your Baby

What is heroin?

Heroin is a naturally occurring opiate that is made from morphine. It comes from Poppy plants and was first made in 1874 as a treatment for morphine and opium addiction. Unfortunately, it is even more addictive than either morphine or opium. Street names for heroin include smack and junk. Heroin addiction is commonly treated with Methadone.

When I use heroin does it get into my baby's body too?

Yes. When you use heroin, in any way or form, it passes from your bloodstream, through the placenta, and into your baby's body.

How long does heroin stay in the body?

The amount of time that heroin stays in your body depends on your age, your height and weight, your metabolism, your body fat, the amount and kind of heroin you took, and the health of your liver and kidneys. Heroin can be detected in your system for up to 7 days.

What happens if a woman uses heroin while she's pregnant?

If you use heroin during pregnancy, it can cause serious problems for your baby like premature birth, Neonatal Abstinence Syndrome (NAS), birth defects and stillbirth. If you're pregnant and using heroin, don't stop taking it without getting treatment from your health care provider first. Quitting heroin suddenly (going cold turkey) can cause severe problems for your baby, including death.

Treatment with drugs like methadone or buprenorphine can help you reduce your dependence on heroin in a way that's safer for your baby.

40-80% of babies born to moms who are addicted to heroin or who are taking Methadone will go through withdrawal; this is called NAS.

Neonatal abstinence syndrome (NAS)

- Signs and symptoms can be different for every baby with NAS. Most appear within 3 days (72 hours) of birth, but some can appear right after birth or within a few weeks of birth. Signs and symptoms can include:
 - Body shakes (tremors), seizures (convulsions), overactive reflexes (twitching) and tight muscle tone
 - Fussiness, excessive crying or having a high-pitched cry
 - Poor feeding, poor sucking or slow weight gain
 - Breathing really fast
 - Fever, sweating or blotchy skin
 - Trouble sleeping and lots of yawning
 - Diarrhea or throwing up
 - Stuffy nose or sneezing
- Not all babies with NAS have the same symptoms. Symptoms depend on:
 - What drug you used during pregnancy
 - How much you used and how long you took it
 - How your own body breaks down the drug
 - If your baby was born prematurely (before 37 weeks of pregnancy)

- NAS can last from 1 week to 6 months after birth.

How is your baby tested for NAS?

Your baby's provider can use these tests to see if he/she has NAS:

- Neonatal abstinence scoring system. This system gives points for each NAS symptom depending on how severe it is. Your baby's provider uses the score to decide what kind of treatment your baby needs.
- Test of your baby's first bowel movements (also called meconium)
- Test of your baby's urine

How is NAS treated?

- Your baby's treatment may include:
 - **Your presence at bedside.** It is important you stay with your baby as much as possible to provide care to your baby. You are the best treatment option for your baby. The NICU team will provide education and partner with the you to provide support for you while caring for your infant. The focus will be on the infant's ability to eat, sleep, console.
 - **NAS Scoring** every 4 hours. If symptoms are severe the scoring will be done every 2 hours. Babies with high scores will be scored every 2 hours until their scores are consistently lower.
 - **Taking medicines to treat or manage severe withdrawal symptoms.** If your baby has high NAS scores, your baby's provider may give him or her a medicine that's similar to the drug you used during pregnancy. This can help relieve your baby's withdrawal symptoms. Once these symptoms are under control, your baby gets smaller doses of the medicine over time so his or her body can adjust to being off the medicine. Medicines used to treat severe withdrawal symptoms include morphine, methadone and buprenorphine.
 - **Getting fluids through a needle into a vein (also called intravenous or IV).** Babies with NAS can get very dehydrated from having diarrhea or throwing up a lot. If a baby's dehydrated, he or she does not have enough water in his or her body. Getting fluids through an IV helps keep your baby from getting dehydrated.
 - **Drinking higher-calorie baby formula/breast milk.** Some babies with NAS need extra calories to help them grow because they have trouble feeding or slow growth.
- While your baby's being treated for NAS, he or she may be fussy and hard to soothe. Doing these things can help calm him:
 - Your presence is very important during the baby's hospital stay.
 - Swaddle your baby in a blanket.
 - Give your baby skin-to-skin care (also called kangaroo care). It's when you put your baby, dressed only in a diaper, on your bare chest.
 - Your baby's nurses or neonatal therapists can show you calming techniques for your baby, and you can show them things you learn that help your baby so they can do the same thing when you are not available, or when you have taken a break.

- Keep your baby in a quiet, dimly lit room.
- Breastfeed your baby if you are able. The team taking care of your baby in the hospital will talk with you about if this is possible.
- Ask your doctor for the handout called “Caring for your Sensitive Baby”.
- Most babies with NAS who get treatment get better in 5 to 30 days although some take months to fully get better. It is important to follow up in a Developmental Follow Up clinic and get these appointments set up before your baby goes home (discharge).

More information

- [National Council on Alcoholism and Drug Dependence](#)
- [Substance Abuse Treatment Facility Locator](#)
- [Organization of Teratology Information Specialists](#)

Where can I find more help and support?

<http://mothertobaby.org>:

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Methamphetamine and Your Baby

What is methamphetamine?

Methamphetamine is a highly addictive stimulant or upper that is made from amphetamines like pseudoephedrine from Sudafed. A few different street names for methamphetamine are crank, meth, crystal, ice, and chalk. Methamphetamine is much more addictive than amphetamine because more of the drug can get to the brain at smaller doses.

Is there any safe amount of methamphetamine I can use during pregnancy?

No. There is no safe amount of methamphetamine that you can take during pregnancy. People who use methamphetamines are more likely to use other drugs, smoke, and/or drink alcohol.

You should stop using methamphetamines as soon as you find out you are pregnant. Do not use methamphetamines if you are trying to get pregnant. If you stop using methamphetamines at any point in your pregnancy, you and your baby will be healthier.

How long will methamphetamine stay in the body?

Methamphetamine can stay in your body for up to 4 days.

What happens when a pregnant woman takes methamphetamine?

Methamphetamine is a stimulant or upper. Methamphetamine causes the heart rate of the mother and baby to increase. Methamphetamine can also increase your blood pressure and body temperature to dangerous levels.

I heard methamphetamines can make me go into labor early, is this true?

Yes. Methamphetamines can cause you to go into labor early. Methamphetamine also increases the risk that your baby will not be able to get enough oxygen during labor leading to a decreased heart rate and possible brain damage.

How can methamphetamine affect my baby?

Taking methamphetamine during pregnancy can result in problems like those seen with the use of cocaine in pregnancy.

- The use of methamphetamine can cause the baby to get less oxygen, which can lead to low birth weight.
- Methamphetamine can also increase the likelihood of premature labor, miscarriage, and placental abruption.
- Babies can be born addicted to methamphetamine and suffer withdrawal symptoms that include tremors, sleeplessness, muscle spasms, and feeding difficulties.
- Learning and behavior difficulties may result as the child gets older.

Where can I find more help and support?

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Marijuana and Your Baby

What is marijuana?

Marijuana is a mixture of leaves and flower buds of hemp plants. Marijuana has many street names including Mary Jane, pot, grass, weed, herb, ganga, and bud. Marijuana is a psychoactive drug, meaning that it causes a change in your mood, consciousness, or behavior.

When I smoke marijuana does it get into the baby's body too?

Marijuana crosses the placenta to your baby. Marijuana, like cigarette smoke, contains toxins that keep your baby from getting the proper supply of oxygen that he or she needs to grow.

It is advised that you stop smoking marijuana before you become pregnant and do not smoke during pregnancy or breastfeeding.

How long does marijuana stay in the body?

There are many different things that will affect how long marijuana will stay in your system. Your metabolism, the amount of marijuana that you smoked, ate, or drank, how strong the marijuana is, and how often you use marijuana. Marijuana may be detectable in your system anywhere from 10-90 days depending on all these factors.

What if I only eat marijuana, like edibles?

Marijuana can still affect you and your baby. With edibles you may not know exactly how strong the drug is or how much you are getting. It is best to not smoke, eat, or drink marijuana at all while you are pregnant.

I heard that marijuana is good for morning sickness...

Marijuana is not safe to take during pregnancy. There are other ways to help with morning sickness that don't involve taking illicit drugs. Talk with your doctor about your morning sickness and make a plan.

How can marijuana affect the baby?

Smoking marijuana increases the levels of carbon monoxide and carbon dioxide in the blood, which reduces the oxygen supply to the baby. Smoking marijuana during pregnancy can increase the chance of miscarriage, low birth weight, premature births, developmental delays, and behavioral and learning problems that last through adulthood.

More information

[National Council on Alcoholism and Drug Dependence](#)

[Substance Abuse Treatment Facility Locator](#)

<http://mothertobaby.org/fact-sheets/marijuana-pregnancy/pdf/>

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Opioids-Neonatal abstinence syndrome (NAS)

Key Points

- People take opioids, both prescribed and illegal, for different reasons.
- If you have been taking opioids and become pregnant, talk with your doctor about what you have been taking and the reasons why. Your doctor can help you come up with the best plan to manage your pain or concern during your pregnancy.
- If you're pregnant and taking opioids, talk to your provider before you stop taking them. Stopping opioids too quickly can harm you and your baby.
- Even if you use an opioid exactly as your health care provider tells you to, it may cause neonatal abstinence syndrome in your baby.

What are signs and symptoms of NAS?

- Signs and symptoms can be different for every baby with NAS. Most appear within 3 days (72 hours) of birth, but some can appear right after birth or within a few weeks of birth. Signs and symptoms can include:
 - Body shakes (tremors), seizures (convulsions), overactive reflexes (twitching) and tight muscle tone
 - Fussiness, excessive crying or having a high-pitched cry
 - Poor feeding, poor sucking or slow weight gain
 - Breathing really fast
 - Fever, sweating or blotchy skin
 - Trouble sleeping and lots of yawning
 - Diarrhea or throwing up
 - Stuffy nose or sneezing
- Call your baby's health care provider if your baby has any of these symptoms. Not all babies with NAS have the same symptoms. Symptoms depend on:
 - What drug you used during pregnancy, how much you used and how long you took it
 - How your own body breaks down the drug
 - If your baby was born prematurely (before 37 weeks of pregnancy)
- NAS can last from 1 week to 6 months after birth.
- Neonatal abstinence syndrome can cause serious problems for your baby, like being born too small or having seizures.
- Tell your prenatal care provider about any opioid you take, especially if it's prescribed to you by another health care provider.
- Neonatal abstinence syndrome (also called NAS) happens when a baby is exposed to drugs in the womb before birth. A baby can then go through drug withdrawal after birth.
- NAS most often is caused when a woman takes opioids during pregnancy. Opioids are painkillers (used to relieve pain) your provider may prescribe if you've been injured or had surgery. Prescription opioids include:
 - Codeine and hydrocodone (Vicodin®)
 - Morphine (Kadian®, Avinza®)
 - Oxycodone (OxyContin®, Percocet®)

- The street drug heroin also is an opioid. When you take these kinds of drugs during pregnancy, they can pass through the placenta and cause serious problems for your baby. The placenta grows in your uterus (womb) and supplies your baby with food and oxygen through the umbilical cord.

Can using other drugs lead to neonatal abstinence syndrome in your baby?

- Yes. In addition to opioids, using these drugs during pregnancy can lead to NAS in your baby:
 - Antidepressants (prescription drugs used to treat depression)
 - Benzodiazepines (sleeping pills, sedatives)

What problems can neonatal abstinence syndrome cause in your baby?

- Babies with NAS are more likely than other babies to be born with low birthweight (less than 5 pounds, 8 ounces), have breathing and feeding problems and seizures. They usually have to stay in the hospital longer after birth than babies without NAS.
- Taking opioids and other drugs during pregnancy can cause your baby to be born with birth defects. A birth defect is a health condition that is present at birth. Birth defects can change the shape or function of one or more parts of the body. They can cause problems in overall health, how the body develops, or in how the body works.

What can you do to help prevent NAS in your baby?

- If you're pregnant and you use any of the drugs that can cause NAS, tell your health care provider right away. But don't stop taking the drug without getting treatment from your provider first. Quitting suddenly (sometimes called cold turkey) can cause severe problems for your baby, including death. If you need help to stop using these drugs, talk to your provider about treatment to help you quit. Getting treatment can help you stop using drugs and is safer for your baby than getting no treatment at all.
- If you're addicted to opioids, medication-assisted treatment (also called MAT) during pregnancy can help you and your baby. NAS in babies may be easier to treat for babies whose moms get MAT during pregnancy. Medicines used in MAT include methadone and buprenorphine.
- Even if you use a prescription drug exactly as your provider tells you to, it may cause NAS in your baby. During pregnancy, tell your prenatal care provider about any drug or medicine you take. If you go to a health care provider who prescribes medicine to treat a health condition (like sleep problems or severe pain), **make sure that provider knows you're pregnant**. You may need to stop taking certain medicines or change to medicine that's safer for your baby. Ask all your health care providers if the drugs you take—even prescription drugs—can cause NAS in your baby.
- If you're pregnant, tell your health care provider right away about any drug or medicine you take. She can make sure that what you're taking is safe for you and your baby. She also can help you get treatment for using street drugs or abusing prescription drugs if you need it. If you abuse prescription drugs, it means you take more than has been prescribed for you, you take someone else's prescription drug, or you get the drug from someone without a prescription.

How is your baby tested for NAS?

- Your baby's provider can use these tests to see if he has NAS:
 - Neonatal abstinence scoring system. This system gives points for each NAS symptom depending on how severe it is. Your baby's provider uses the score to decide what kind of treatment your baby needs.
 - Test of your baby's first bowel movements (also called meconium)
 - Test of your baby's urine

How is NAS treated?

- Your baby's treatment may include:
 - **Your presence at bedside.** It is important you are present to provide care to your baby. You are the best treatment option for your baby. The NICU team will provide education and partner with the you to provide support for you while caring for your infant. The focus will be on the infant's ability to eat, sleep, console.
 - **NAS Scoring:**
 - Your baby will be scored every 4 hours. If they have high scores they will get scored every 2 hours until 24 hours after their scores are lower. Scoring is based on how much your baby cries, sleeps, any seizures or tremors, and sweating, among other things. Based on your baby's score, the physician will determine if medications are needed, if a medication dose is working, or if it is time to lower the dose.
 - **Your nurse will explain the scoring in full detail.**
 - **Scores are based on an average since the last scoring was done, so points may be given for excessive sneezing, for example, when the baby is not currently sneezing.** The points might be given if there was a sneezing spell since the last scoring was done.
 - **Taking medicines to treat or manage severe withdrawal symptoms.** Your baby's provider may give her a medicine that's similar to the drug you used during pregnancy. This can help relieve your baby's withdrawal symptoms. Once these symptoms are under control, your baby gets smaller doses of the medicine over time so the baby's body can adjust to being off the medicine. Medicines used to treat severe withdrawal symptoms include morphine, methadone and buprenorphine.
 - **Getting fluids through a needle into a vein (also called intravenous or IV).** Babies with NAS can get very dehydrated from having diarrhea or throwing up a lot. If a baby is dehydrated, she doesn't have enough water in her body. Getting fluids through an IV helps keep your baby from getting dehydrated.
 - **Drinking higher-calorie baby formula.** Some babies with NAS need extra calories to help them grow because they have trouble feeding or slow growth. Extra calories can be added to your pumped breast milk too.
- Most babies with NAS who get treatment get better in 5 to 30 days but some infants require more than a month in the hospital to recover.

- Babies with NAS do much better when family is by their side to comfort and hold them. While your baby is in the hospital plan to come frequently.
- **While your baby's being treated for NAS, the baby may be fussy and hard to soothe. Doing these things can help calm your baby:**
 - Swaddle your baby in a blanket.
 - Give your baby skin-to-skin care (also called kangaroo care). It's when you put your baby, dressed only in a diaper, on your bare chest.
 - Keep your baby in a quiet, dimly lit room.
 - Breastfeed your baby.
 - Have a backup holder, someone who can relieve you when the baby needs to be held but when you need a break.

Where can I find more help and support?

<http://mothertobaby.org>:

Mothertobaby help line: **1-866-626-6847** or text **1-855-999-3525**

[National Council on Alcoholism and Drug Dependence](https://www.ncadd.org)

[https://www.ncadd.org/](https://www.ncadd.org)

Hope Line: **1-800-622-2255**

[Substance Abuse Treatment Facility Locator](https://findtreatment.samhsa.gov/)

<https://findtreatment.samhsa.gov/>

SAMHSA's National Helpline (also known as the Treatment Referral Routing Service) is a confidential, free, 24-hour-a-day, 365-day-a-year, information service, in English and Spanish, for individuals and family members facing mental and/or substance use disorders. This service provides referrals to local treatment facilities, support groups, and community-based organizations. Callers can also order free publications and other information.

Call **1-800-662-HELP (4357)** or visit the [online treatment locators](#). The service is open 24/7, 365 days a year.

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Hallucinogenic Drugs: PCP, LSD, Peyote, and Ketamine

What are hallucinogenic drugs?

Hallucinogenic drugs are drugs that change the way you think or are aware of reality. There are two types of hallucinogenic drugs. Classic hallucinogens cause you to see or hear things that aren't really there. Dissociative hallucinogens cause you to feel separated from yourself (depersonalization) or separated from reality (derealization). Types of hallucinogenic drugs include LSD, PCP, Peyote, and Ketamine

When I use hallucinogenic drugs do they get into my baby's body too?

Yes. Any drugs that you take during pregnancy can pass through the placenta and into your baby's blood stream.

How long do hallucinogenic drugs stay in the body?

Each drug is slightly different and how quickly your body can get rid of it depends on many factors including your metabolism, how much of the drug you took, any other drugs or alcohol consumed with the drug, and what kind of drug you took. PCP can be in your body for up to 14 days, LSD can be in your body for up to 3 days, Peyote can be in your body for up to 10 days, and Ketamine can stay in your body for up to 2 weeks. It is important to remember that many drugs are stored in specific areas of your body, like your hair follicles, where it can be detected for three months.

How do hallucinogenic drugs affect my baby?

PCP is also known as Angel Dust, PeaCe Pill, Hog, Lovely, Wack, Ozone, Dust, Embalming Fluid, Rocket Fuel; Supergrass and may be used in "killer joints" combined with marijuana. PCP use during pregnancy can lead to low birth weight, poor muscle control, brain damage, and withdrawal syndrome if used frequently. Withdrawal symptoms include lethargy, alternating with tremors.

LSD is also known as acid, blotter, dots, Heavenly Blue, micro dot, Tab, Yellow Sunshine, Golden Dragon, Hippie, Zen, Pane, Cid. There is not very much information on the effect of LSD on an unborn baby. Some research does say that LSD can lead to birth defects if used frequently.

Peyote: Peyote is also known as Mescaline. Mescaline can cause problems with your baby's growth in the womb. Mescaline can also cause babies to have birth defects when used during pregnancy. For Native mothers wondering about using peyote during spirit journeys while pregnant or when breastfeeding, there is great information at the following link: <http://nativemothering.com/2011/05/should-i-use-peyote-if-i-am-pregnant-or-breastfeeding/>

Special K/Ketamine can possibly cause your baby to be too small when it's born, which is called small for gestational age. Ketamine can also have some bad side effects when take during and later in pregnancy, such as poor reflexes and muscle control and it can also slow the breathing of your baby after delivery, known as respiratory depression. It

is safe to stop taking Ketamine during pregnancy and it is best to not take it at all if you plan to become pregnant or at any time during your pregnancy.

Where can I find more help and support?

<http://mothertobaby.org>:

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SSRI's

What are SSRI's?

Selective Serotonin Reuptake Inhibitors or SSRI's are a type of antidepressant medication that are usually considered to be safe to take during pregnancy.

Can I use an SSRI during pregnancy?

Women who use SSRI's should keep taking them during pregnancy. Ideally the lowest possible dose should be used.

Some SSRIs can increase the risk of birth defects, but the chance is very low.

One particular SSRI, paroxetine or Paxil, has the greatest possibility of causing heart defects in your unborn baby. If you are taking Paxil and become pregnant talk to your doctor about changing your medication

Do not stop taking your SSRI without talking to your doctor first. Stopping your SSRI medication too fast can lead to increased depression or anxiety, nausea, fatigue, mood swings, and symptoms like you have the flu. It is best to come up with a plan of action with your physician for stopping your SSRI or switching to a lower dose if that is something you choose to do during your pregnancy.

Some babies may require treatment for withdrawal from meds after birth.

Talk to your doctor and the Lactation Consultant about breastfeeding on your particular medication.

Where can I find more help and support?

<http://mothertobaby.org>:

Mother to baby help line: **1-866-626-6847** or text **1-855-999-3525**

<http://mothertobaby.org/fact-sheets/citalopramescitalopram-celexalexapro-pregnancy/pdf/>

<http://mothertobaby.org/fact-sheets/fluoxetine-prozac-pregnancy/pdf/>

<http://mothertobaby.org/fact-sheets/paroxetine-paxil-pregnancy/pdf/>

<http://mothertobaby.org/fact-sheets/sertraline-zoloft-pregnancy/pdf/>

Cocaine Prenatal Management for Providers

There are two conflicting schools of thought regarding Cocaine and Neonatal Abstinence Syndrome (NAS). Both are presented here for your consideration. An extensive bibliography is included for additional independent review. Both agree that Cocaine in pregnancy is bad, the difference lies solely in whether the drug causes a true NAS, or if the behavioral issues at birth are a transient drug effect.

Areas of Agreement amongst All Sources:

Maternal Complications:

- Poor nutritional status
- Increased risk for infections
- Hypertension/tachycardia/arrhythmias/myocardial infarctions
- Central nervous system hemorrhage
- Depression and low self-esteem
- Increased tendency to engage in risk behaviors for HIV

Pregnancy, Labor, and Delivery Complications:

- Spontaneous abortion
- Poor weight gain
- Abruptio placentae
- Fetal demise
- Precipitous delivery

Neonatal Complications:

- Intrauterine growth retardation
- Microcephaly or reduced head circumference
- Prematurity
- Congenital malformations/vascular disruption
- Congenital infections
- Cardiovascular dysfunction/arrhythmias
- Feeding difficulties/necrotizing enterocolitis
- Central nervous system hemorrhagic-ischemic lesions
- Neurobehavioral dysfunction
- Seizure activity
- Sudden infant death syndrome (SIDS)
- Increased possibility of HIV involvement

Area of disagreement:

- Cocaine causes NAS:
 - Babies who are exposed to cocaine later in pregnancy may be born dependent and suffer from withdrawal symptoms such as tremors, sleeplessness, muscle spasms, and feeding difficulties.
- Cocaine does not cause NAS: AAP and Emory University
 - “There is a lack of evidence confirming the presence of NAS following gestational cocaine and marijuana exposure.”

- For cocaine and other stimulants like methamphetamine, exposure to such drugs does not produce a “clearly defined” withdrawal syndrome in babies. (In some studies, observers failed to detect specific problems in babies, unless they were specifically told the babies had been exposed to cocaine.) While some studies have found subtle differences in behavior in cocaine-exposed children, these are comparable in scale to those seen in babies born to women who smoked cigarettes while pregnant.
- No studies have been published that substantiate or quantify cocaine withdrawal in neonates. Neurobehavioral abnormalities frequently occur in neonates with intrauterine cocaine exposure, most frequently on days 2 and 3; however, this is consistent with cocaine effect rather than with withdrawal. Stimulant-exposed neonates (amphetamines, cocaine, or both) have been shown to be less symptomatic than opiate-exposed infants. In the only study in which observers blinded to infant drug exposure performed the observations, no differences in withdrawal signs were seen between cocaine-exposed and unexposed infants. Finnegan et al have suggested a separate scoring instrument might be appropriate to assess cocaine exposure.
- Neurobehavioral abnormalities frequently occur in neonates with intrauterine cocaine exposure, most frequently on the second or third postnatal days. These abnormalities may include irritability, hyperactivity, tremors, high-pitched cry, and excessive sucking. Because cocaine or its metabolites may be detected in neonatal urine for as long as 7 days after delivery, observed abnormalities in exposed infants may reflect drug effect rather than withdrawal.
- Recent studies have failed to find any characteristic neonatal withdrawal syndrome based on the Brazelton Neonatal Behavioral Assessment Scale. In addition, more recent controlled studies, published in the 2000s, have failed to confirm earlier reports regarding cocaine withdrawal. Eyer et al compared cocaine-exposed infants based on urine toxicology testing status at birth and failed to find any evidence for acute cocaine toxicity or cocaine withdrawal in those infants who were positive for cocaine metabolites at birth. However, an overall drug effect of cocaine was noted, and consisted of increased autonomic regulation (eg, more startles and tremors). Similarly, the Maternal Lifestyle Study failed to demonstrate neonatal withdrawal in cocaine-exposed infants but did report mild, transient neurologic findings such as irritability, jitteriness, tremors, high-pitched cry, and excessive sucking. Investigators concluded that these increased central and autonomic nervous system symptoms and signs were more likely in keeping with a cocaine effect. Therefore, due to the lack of convincing evidence from controlled studies, neonatal cocaine withdrawal is not likely a true syndrome and earlier findings may have been more indicative of an intrauterine cocaine exposure effect.

How often are meds required for withdrawal?

In an unblinded study, all drug-exposed infants, including those exposed only to cocaine, had more severe abstinence signs on an opiate scoring system than the unexposed group. Of the infants, 6%, 14%, and 35% of infants exposed to cocaine only, heroin only, or cocaine plus heroin, respectively, qualified for treatment based on scoring. In the only study in which observers blinded to infant drug exposure performed the observations, no differences in withdrawal signs were seen between cocaine-exposed and unexposed infants.

Management:

Treatment for the neonate demands an appropriate nursery environment, comprehensive assessments, pharmacologic intervention, and clinical diagnostic studies.

- Optimal Nursery Environment - Such an environment features sound primary nursing care, gentle handling by as few caretakers as possible, and an avoidance of stimuli such as light and noise that will irritate the baby. To facilitate and promote optimal infant growth and development, nursery personnel should carefully monitor feeds, initiate strategies to facilitate intake for those infants experiencing feeding difficulties, observe for feeding intolerance or necrotizing enterocolitis, provide opportunities to interact with parents and environment as the infant is able to tolerate them, and provide primary nursing to facilitate parent-infant interactions.
- Brazelton Neonatal Behavioral Assessment Scale - Use of the Brazelton Neonatal Behavioral Assessment Scale is encouraged. This scale has been used extensively to evaluate newborn behavior such as habituation and responsivity to stimuli (faces, voices, light, bell, rattle, etc.); state (sleeping, alertness); characteristics of changes in state (irritability, inconsolability); and neurological and motor development. Although clinical expertise is demanded to administer the Brazelton Scale, programs will find it useful in evaluating infants exposed to drugs
- Neonatal Neurotoxicity Assessment - While asymptomatic infants do not need to be systematically assessed for neonatal neurotoxicity, consideration should be given to developing scoring criteria for those infants who are symptomatic. In the presence of significant withdrawal symptoms, other etiologies, including polydrug and alcohol exposure and metabolic problems, should be explored.
- Pharmacotherapy - If irritability persists in an infant, a short course of phenobarbital is recommended.
- Central Nervous System Imaging - Cranial sonograms are not routinely recommended, but recent literature is suggestive of CNS abnormalities, including hemorrhagic ischemic lesions in some drug-exposed infants. As yet, evidence is insufficient to support a mandate for cranial sonograms in all cocaine-exposed infants. However, special consideration should be given to specific neuroimaging of cocaine-exposed preterm infants, infants whose head circumference falls below the 10th percentile on standardized fetal growth curves, and infants with abnormal neurologic signs, neurobehavioral dysfunction, or seizure activity.
- Assessment for Congenital Malformations / Vascular Disruptions - Clinicians should have a heightened awareness of the possibility of uncommon but

significant congenital malformations or vascular disruptions reported in cocaine-exposed neonates. Systems that may be affected include the genitourinary tract, cardiovascular system (congenital heart malformations), gastrointestinal tract, and skeletal system. Echocardiography and abdominal ultrasound are not currently recommended as routine assessments in cocaine-exposed infants, but should be performed based on clinical indications.

- Sudden Infant Death Syndrome - As indicated earlier, SIDS is a multifactorial problem, and opiate exposure is known to increase the neonate's risk of SIDS. There is some controversy over the incidence of SIDS in cocaine-exposed infants, but crack cocaine does appear to raise the risk slightly over controls. Data also suggest that cocaine-exposed infants may exhibit respiratory dysfunction. There are no indications that apnea monitoring decreases the incidence of SIDS. Routine home apnea monitoring for drug-exposed infants is therefore not recommended.

Preterm Infants:

- Cocaine may cause premature birth or abruption leading to early delivery.
- The constellation of complications will depend on the gestation at birth.
- Chances of a premature delivery increase 25% with cocaine use.

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Ecstasy: X, E or MDMA Prenatal Management for Providers:

It is safe to stop amphetamines and ecstasy during pregnancy.

It's hard to know exactly how club drugs affect pregnancy. Pregnant women who take club drugs often drink alcohol or smoke. So it's hard to know which of these activities is responsible for certain pregnancy problems. But using any kind of street drug during pregnancy may cause serious problems, including:

- **Premature birth.** Birth before 37 weeks of pregnancy.
- **Low birthweight.** Birthweight less than 5 pounds, 8 ounces.
- **Congenital Problems.** Cardiac issues, cleft palate, musculoskeletal, club foot
- **Developmental Delays.** Studies show developmental delays well into childhood including learning disabilities.
- **NAS.** NAS is rarely the result of Ecstasy use alone.

What is ecstasy?

- Ecstasy comes as a pill taken by mouth. It's sometimes called the "love drug" because it makes users feel very friendly and touchy-feely. It also can cause feelings of depression or confusion and make one have trouble remembering things. It is an amphetamine.
- Using ecstasy may cause maternal health problems, including:
 - Trouble sleeping
 - Very fast heart rate
 - High blood pressure
 - Nausea
 - Blurred vision
 - Teeth clenching

Risks for the Neonate:

- According to a study published in 2003 in the journal *Neurotoxicity and Teratology*, the use of MDMA in the first trimester of pregnancy produces as much as a 500 percent increase in the number of cells called neurons inside the fetal brain; outside of the womb, these cells carry out the basic tasks required for coordinated brain function and the maintenance of normal consciousness. More nerve cells does not mean the baby does better.
- The greatest impact of this excessive neuron growth occurs in the frontal cortex, a portion of the brain that helps control impulsive behavior, helps maintain focus and attention, and is needed for higher-level planning. Excessive neuron growth also occurs in a portion of the brain called the striatum, which has responsibilities during childhood and adulthood that include controlling normal movement and regulating the links between pleasurable sensations and behaviors that support health and well-being.
- Developmental delays have been noted at 4 and 12 months; studies unclear if these delays persist. The severity of the delay appears related to the amount of Ecstasy taken during the pregnancy.
- A retrospective report of 136 babies exposed to Ecstasy *in utero* noted premature births, a significantly increased risk of congenital defects,

cardiovascular anomalies, and musculoskeletal anomalies. Another study in the Netherlands reported congenital cardiac malformation and spontaneous abortions. Additionally there is an increased risk for cleft palate. The risk for congenital anomalies is about 4 times more than normal.

- Few studies have been completed on its use. Babies born to women who use these drugs during pregnancy may face some of the same risks as babies exposed to other types of amphetamines.
- Possible effects of generalized amphetamine use on the fetus and newborn have been reported and include the following:
 - increased fetal and neonatal blood pressure
 - hypoxia
 - increased risk of congenital heart disease
 - higher risk of congenital anomalies
 - preterm labor
 - 2.2% develop withdrawal symptoms (drowsiness, jitteriness, tremors, hypertonicity, hypotonicity or floppiness, trouble eating or sleeping, lethargy, high-pitched cry, frantic fist-sucking, diarrhea, fever, tachypnea, hyperreflexia, excoriation, yawning, or sneezing)

How often are meds required for withdrawal?

In a study done in Thailand between 1998 and 2002 amphetamine exposed infants developed drug withdrawal symptoms with the mean onset of 10-21 hours. None of the amphetamine withdrawal infants needed specific treatment. They recovered spontaneously within 1-6 days.

Management:

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until/unless Finnegan scores indicate that a higher level of care is needed.
- Finnegan Abstinence Scoring is done after feeds, at 3 to 4 hour intervals, when the infant is awake. The score should represent the status of the infant both at the time of assessment, and during the preceding time period.
- **Developmental follow up is very important to minimize the impact of brain and motor delays during the first year of life.**

Preterm Infants:

- Amphetamines in general may cause premature birth.
- The constellation of complications will depend on the gestation at birth.

Breastfeeding:

AAP 2001: The Committee on Drugs strongly believes that nursing mothers should not ingest drugs of abuse, because they are hazardous to the nursing infant and to the health of the mother.

- Drugs of abuse for which adverse effects on the infant has been reported (Amphetamine, Cocaine, Heroin, Marijuana, Phencyclidine)CDC:

Breastfeeding is NOT advisable if the infant's mother is using or is dependent upon an illicit drug.

Resources for patients:

- National Council on Alcoholism and Drug Dependence
(800) 622-2255
- Substance Abuse Treatment Facility Locator
(800) 662-4357

References:

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Heroin Prenatal Management for Providers

The cycle of opioid use and withdrawal is particularly devastating for the developing fetus. The repetitive pattern of use and withdrawal leads to fetal hypoxia and uteroplacental insufficiency with resultant increased risk of prematurity, fetal demise and low birth weight.

Comprehensive prenatal care is essential for these patients.

- Medication-assisted treatment has been the standard of care for pregnant opioid-dependent patients. At appropriate dosages, methadone, a synthetic opioid, will eliminate symptoms and signs of withdrawal, reduce cravings, and block euphoric effects should supplemental opioids be used. The long half-life and predictable dosing prevents erratic opioid levels in the fetus, and is associated with a longer duration of pregnancy and improved fetal growth.
- As the pregnancy progresses, methadone is metabolized more rapidly and higher doses are required. Although there were early reports suggesting that the dose of methadone correlated with the incidence and severity of neonatal withdrawal signs, recent evidence does not demonstrate such a relationship. (Berghella V, 2003) (McCarthy JJ, Leamon MH, 2005).
- It is well accepted that lowering the dose during pregnancy may lead to increased illicit drug use, thus exposing the mother and fetus to more harm. Buprenorphine, a partial opioid-agonist, has recently been approved by the United States Food and Drug Administration for the treatment of opioid addiction in an outpatient office setting. Although not yet approved for use in pregnancy, preliminary studies suggest that buprenorphine is associated with a decreased incidence of neonatal withdrawal when compared with methadone (Kakko J, 2008).

Onset, Duration, and Frequency of NAS Caused by Various Substances

| Drug | Onset | Frequency | Duration |
|---------------|-------------|-----------|-----------------------|
| Heroin | 24–48 hours | 40–80% | 8–10 days |
| Methadone | 48–72 hours | 13–94% | Up to 30 or more days |
| Buprenorphine | 36–60 hours | 22–67% | Up to 28 or more days |

Clinical Symptoms in Neonates:

The different time courses reflect variations in the half-lives of drug elimination. However, if 1 week or longer has elapsed between the last maternal opioid use and delivery of the infant, the incidence of neonatal withdrawal is relatively low.

- **Neurologic Excitability**
 - Tremors, Irritability, Increased wakefulness, High-pitched crying, Increased muscle tone, Hyperactive deep tendon reflexes, Exaggerated Moro reflex, Seizures, Frequent yawning and sneezing

- **Gastrointestinal Dysfunction**
 - Poor feeding, Uncoordinated and constant sucking, Vomiting, Diarrhea, Dehydration, Poor weight gain,
- **Autonomic signs:**
 - Increased sweating, Nasal stuffiness, Fever, Mottling, Temperature instability

The severity of symptoms of Neonatal Abstinence Syndrome depend on:

- The type of drug the mother used
- How the mother's body breaks down the drug
- How much of the drug she was taking
- How long she used the drug
- Whether the baby was born full-term or early (premature)

How often are meds required for withdrawal?

Approximately 50-75 percent of infants born to women on heroin (or Methadone/ Buprenorphine) will require treatment with medicine for withdrawal symptoms.

Management:

At the delivery of a known opioid-dependent woman, naloxone should be avoided in resuscitation of the infant as it may precipitate seizures.

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until/unless Finnegan scores indicate that a higher level of care is needed.
- Women on methadone or buprenorphine maintenance therapy are encouraged to breastfeed their infants, providing they are HIV negative (McCarthy J, 2000) (Substance Abuse and Mental Health Services Administration, Treatment Improvement Protocols, 2004).
- Finnegan Abstinence Scoring is done after feeds, at 3 to 4 hour intervals, when the infant is awake. The score should represent the status of the infant both at the time of assessment, and during the preceding time period.
- Quantifying the severity of NAS assists in determining if and when pharmacological intervention will be needed. Scoring also assists in monitoring, titrating, and terminating therapy.
- If abstinence scores are over 8 for in 3 consecutive exams, the infant should be transferred to the NICU/Special Care Nursery for treatment and monitoring.
- Infants may require intravenous fluids to maintain hydration.
- Caloric expenditure is frequently elevated, and therefore increasing the caloric density of feeds may be indicated.
- Pharmacologic therapy is indicated for infants with increasing severity of signs and in cases of significant vomiting, diarrhea, or excessive weight loss.
- Throughout the hospital stay family involvement is imperative and can lessen the impact of withdrawal on the infant.
- Infants may be treated with a variety of medications including short-acting opioids such as morphine sulfate and long-acting opioids such as methadone.
 - Methadone may be continued and weaned as an outpatient.

- Morphine sulfate should be restricted to hospitalized infants and weaned completely prior to discharge home. *The weaning process is completely dependent on the individual and may take weeks to complete.*

Preterm Infants:

Preterm infants have been described as at lower risk of drug withdrawal with less severe and/or prolonged courses. Infants born at <35 weeks' gestation whose mothers received methadone maintenance had significantly lower total and CNS abstinence scores than did term infants of mothers receiving similar methadone dosages. In a more recent study, lower gestational age correlated with a lower risk of neonatal withdrawal. The apparent decreased severity of signs in preterm infants may relate to:

- developmental immaturity of the CNS
- differences in total drug exposure
- lower fat depots of drug
- clinical evaluation of abstinence may be more difficult because scoring tools to describe withdrawal were largely developed for use with term or late preterm infants.

In a retrospective study, Dysart et al compared the length of hospital stay, duration of medication, and cumulative medication exposure for preterm and term infants born to mothers enrolled in a methadone maintenance program. Infants were evaluated by using an abstinence scoring system and treated uniformly with a neonatal opiate solution. All adverse outcomes were reduced in the preterm cohort.

Although the withdrawal process may be less difficult with the premature baby, the babies will still be impacted by other complications related to the degree of prematurity (respiratory insufficiency, feeding difficulties, etc).

References:

<http://pediatrics.aappublications.org/content/134/2/e547>

<http://pediatrics.aappublications.org/content/129/2/e540>

http://www.pqcnc.org/documents/nas/nasresources/VCHIP_5NEONATAL_GUIDELINE_S.pdf

Kratom Prenatal Management for Providers

What is Kratom?

Kratom is a tropical tree native to Southeast Asia. Consumption of its leaves produces both stimulant effects (in low doses) and sedative effects (in high doses), and can lead to psychotic symptoms and psychological addiction. The psychoactive ingredient is found in the leaves from the kratom tree. These leaves are subsequently crushed and then smoked, brewed with tea, or placed into gel capsules. Also known as thang, kakuam, thom, ketum, and biak, kratom is more commonly abused in the Asia Pacific region than the United States.

Kratom has sedative, narcotic and euphoric effects at high dosages. It is used in traditional medicine and as an opium substitute. Researchers are currently looking at Kratom as an alternative treatment to opioids and opioid dependence although no studies have yet been completed.

It is listed by the DEA as a drug of concern but is not scheduled under the Controlled Substances Act in the US. Kratom is widely available on the Internet. The DEA was going to change this to a Class I drug, however they were taking public comments until Dec 1, 2016 and have not issued a statement yet based on that input.

Kratom is controlled under narcotic laws in several countries throughout Europe and in Australia, Malaysia, Myanmar, Thailand and New Zealand.

How does kratom affect the brain?

Two compounds in kratom leaves, *mitragynine* and *7-hydroxymitragynine*, interact with opioid receptors in the brain, producing sedation, pleasure, and decreased pain, especially when users consume large amounts of the plant. However, there can be uncomfortable and sometimes dangerous side effects.

Mitragynine may also interact with other receptor systems in the brain to produce stimulant effects. When kratom is taken in small amounts, users report increased energy, sociability, and alertness instead of sedation.

Kratom Dependence

The withdrawal symptoms in humans are relatively mild and typically diminish within a week.

- Craving, weakness and lethargy, anxiety, restlessness, rhinorrhea, myalgia, nausea, sweating, muscle pain, jerky movements of the limbs, tremor as well as sleep disturbances and hallucination may occur.
- Can precipitate withdrawal symptoms in Neonates (NOTE: No reference available for this statement).

Kratom and animal studies

- Cough-suppressant effects of mitragynine were comparable to those of codeine.
- The analgesic effect of 7-hydroxymitragynine was several times more potent than morphine.
- Mice chronically treated with 7-hydroxymitragynine developed tolerance and cross-tolerance to morphine.
- Withdrawal precipitated by naloxone administration

The many forms of Kratom:

- Tinctures and capsules, filled with powdered kratom
- Kratom Tea:
 - Traditionally, the fresh or dried leaves of kratom are chewed or brewed into tea. Lemon juice is often added to facilitate the extraction of plant alkaloids. Sugar or honey may be added to mask the bitter taste.
- Ketum Drinks:
 - Prepared by extended boiling of fresh leaves in water. One 250 ml glass of 'ketum' contained 22.5–25 mg mitragynine. About three such drinks a day are said to be sufficient to diminish opiate withdrawal symptoms.
- 4 x 100:
 - Ice-cold cocktails made from Kratom leaves, Caffeine-containing soft drink and Codeine- or diphenhydramine-containing cough syrup. May also add anxiolytic, antidepressant or an analgesic drug

Pregnancy and breast-feeding

There is not enough reliable information about the safety of taking kratom during pregnancy or breast-feeding. Encourage patients to avoid.

What are the health effects of kratom?

Reported health effects of kratom use include:

- sensitivity to sunburn
- nausea
- itching
- sweating
- dry mouth
- constipation
- increased urination
- loss of appetite
- Psychotic symptoms have been reported in some users.

Kratom by itself is not associated with fatal overdose, but commercial forms of the drug are sometimes laced with other compounds that have caused deaths.

Is kratom addictive?

Like other opioid drugs, kratom may cause dependence (feeling physical withdrawal symptoms when not taking the drug), and some users have reported becoming addicted to kratom. Withdrawal symptoms include:

- muscle aches
- insomnia
- irritability
- hostility
- aggression
- emotional changes
- runny nose
- jerky movements

References:

<https://dbhdid.ky.gov/dbh/documents/ksaods/2015/Phinney.pdf>

<http://www.webmd.com/vitamins-supplements/ingredientmono-1513-kratom.aspx?activeingredientid=1513&activeingredientname=kratom>

<https://www.drugabuse.gov/publications/drugfacts/kratom>

https://www.dea.gov/pr/multimedia-library/publications/drug_of_abuse.pdf

Methamphetamines Prenatal Management for Providers

Methamphetamines are made in makeshift labs or imported into the United States. These illegal drugs are some of the most abused drugs in America. Methamphetamines are chemically related to amphetamines. Street names include meth, speed, crystal meth, Tina, p, glass, crank, crystal, zip, and ice. The chemicals involved in the manufacturing of methamphetamines are flammable, explosive, and corrosive. Methamphetamine is very detrimental and addictive when smoked, snorted, injected, or taken orally or rectally. Products used in the extraction and purification of methamphetamines may include ammonia, lye, drain cleaner, and ephedra. Methamphetamines can cause tachycardia, sweating, decreased appetite, difficulty sleeping, hallucinations, and emotional problems, such as paranoia or anxiety. Pregnant women who abuse methamphetamine are at increased risk of preterm birth, placental abruption, fetal distress, and intrauterine growth restriction at rates similar to those for pregnant women who use cocaine.

Clinical risks to the fetus and newborn:

| Drug Class | Onset of withdrawal | Frequency of withdrawal | Duration |
|------------------|---------------------|-------------------------|-----------|
| Methamphetamines | 24 hours | 2–49% | 7–10 days |

Effects to the fetus and newborn of methamphetamine use in pregnancy are comparable to cocaine and include:

- miscarriage/fetal death
- placental abruption
- prematurity with its subsequent potential problems
- low birth weight
- smaller-than-normal head circumference
- breathing problems
- poor state control (infant unable to self-regulate)
- increased risk of SIDS
- fetal/neonatal death
- withdrawal symptoms (drowsiness, tremors, hypertonicity, hypotonicity or floppiness, trouble eating or sleeping, lethargy, high-pitched cry, frantic fist-sucking, hyperreflexia)

Possible long-term problems for the baby include:

- aggressive behavior
- peer-related problems
- decrease in IQ at 4 years of age
- poor academic performance and various adolescent behavior problem

How often are meds needed to treat withdrawal?

In one study, only 4% of infants exposed to methamphetamine were treated for drug withdrawal, but it was not possible to exclude concomitant abuse of other drugs as contributory in all cases.

Management

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until discharge.
- Infants may require intravenous fluids to maintain hydration.
- Caloric expenditure is frequently elevated, and therefore increasing the caloric density of feeds may be indicated.
- Pharmacologic therapy is indicated for infants with increasing severity of signs and in cases of significant vomiting, diarrhea, or excessive weight loss.

Developmental follow-up should be done to mitigate long term effects as the baby grows up.

Preterm Infants:

Preterm infants have been described as being at lower risk of drug withdrawal with less severe and/or prolonged courses. In a more recent study, lower gestational age correlated with a lower risk of neonatal withdrawal.

The apparent decreased severity of signs in preterm infants may relate to:

- developmental immaturity of the CNS
- differences in total drug exposure
- lower fat deposits of drug
- clinical evaluation of abstinence may be more difficult because scoring tools to describe withdrawal were largely developed for use with term or late preterm infants.

Depending on the degree of prematurity, the immediate problems associated with drug use may be overshadowed by the problems inherent in prematurity itself.

Resources:

https://www.westernschools.com/Portals/0/html/H8397/GNn_Yx_files/OEBPS/Text/N1445%20ebooks-4.html

<http://pediatrics.aappublications.org/content/134/2/e547>

<http://pediatrics.aappublications.org/content/129/2/e540>

Marijuana Prenatal Management for Providers

- Pregnant patients should be counseled to stop smoking marijuana.
- Problems at birth are generally mild (unless the baby is premature) but marijuana during pregnancy can have life-long effects on the child.
- The American College of Obstetricians and Gynecologists recommends the following:
 - Before pregnancy and in early pregnancy, all women should be asked about their use of tobacco, alcohol, and other drugs, including marijuana and other medications used for nonmedical reasons.
 - Women reporting marijuana use should be counseled about concerns regarding potential adverse health consequences of continued use during pregnancy.
 - Women who are pregnant or contemplating pregnancy should be encouraged to discontinue marijuana use.
 - Pregnant women or women contemplating pregnancy should be encouraged to discontinue use of marijuana for medicinal purposes in favor of an alternative therapy for which there are better pregnancy-specific safety data.
 - There are insufficient data to evaluate the effects of marijuana use on infants during lactation and breastfeeding, and in the absence of such data, marijuana use is discouraged.

Clinical Symptoms in Neonates and beyond:

- There is a lack of evidence confirming the presence of NAS following gestational marijuana exposure.
- While the gestational and newborn growth outcomes remain equivocal, postnatal neurobehavioral outcomes are only slightly less so.

Newborns exposed to marijuana may exhibit:

- Sleep disturbances (a problem that persists through age 3).
- Shorter, high-pitched cry.
- Altered responses to visual stimuli and increased startles and tremors were noted in newborns exposed to marijuana, with some such symptoms lasting for at least 30 days after birth.
- Other observers, also using the Brazelton Neonatal Behavioral Assessment Scale, have shown no significant differences on these outcomes.

Effects during infancy:

- Decreased mental scores in marijuana-exposed children at 9 months of age were found in the Pittsburgh group, an effect attributed to exposure during the third trimester.
- At 19 months, no significant differences were seen relative to controls. Meanwhile, others have shown no significant cognitive deficits in children ages 1–3 years that were prenatally exposed to marijuana.

Effects during childhood:

- Exposed children at 3 years of age from the higher risk MHPCD study demonstrated attenuated cognitive development, including decreased short-term memory, verbal, and visual skills. These effects correlated with exposure during the first and second trimester yet that can in some populations be ameliorated by environmental enrichment.

Effects during school age:

- As children approach school age, additional detrimental effects of prenatal marijuana exposure become apparent.
- These deficits are not generalized to overall cognition but are specific to higher order function, specifically, executive function.
- Impairments in verbal and memory tasks become apparent in children at age 4, despite exhibiting no such alterations when tested at younger ages.
- At 5–6 years of age, exposed children showed no overall deficits in cognition or language skills, but 6–year-olds showed attention deficits, elevated impulsivity, and hyperactivity. Deficits in short-term memory and verbal reasoning were apparent at this age as well.
- Over time, attention deficits remain and can escalate to increased delinquency and externalizing behaviors. Interestingly, a study on marijuana-exposed fetuses found elevated levels of D2 receptor transcript in the amygdala of males, suggesting potential for altered emotional regulation.
- Alterations in visuospatial memory are also noted in early adolescence. Deficits in these more complex domains were seen at ages 9–12, although other data indicate that deficits in visual and abstract reasoning can be detected as early as 3 years of age.
- Perhaps most striking is that even in their early 20 s, exposed individuals still have deficits in visuospatial working memory and impulsivity.
- Adolescents performed more poorly in some areas of academic testing. These data indicate that prenatal marijuana exposure has significant effects on multiple neurobehavioral outcomes—deficits that are enduring, particularly at the level of executive function.
- Exposed children also exhibit signs of neuropsychiatric disorders and may be more susceptible to substance abuse. For example, children from the MHPCD cohort presented with signs of depression as early as 10 years of age. Moreover, decreased levels of D2 receptor transcript were found in the NAc of exposed fetuses, potentially linking susceptibility to drug use to prenatal marijuana exposure. Prenatally exposed children were also more likely to experiment with marijuana at an earlier age as well as smoke the drug more frequently. Given that drug use and psychiatric disorders are burdens not only to the individual but also to society as a whole, in total these results indicate the prenatal marijuana exposure has persistent deleterious effects that can have considerable consequences

How often are meds required for withdrawal?

Withdrawal is usually not severe enough to warrant medications, unless there is poly-drug use.

Management:

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until/unless Finnegan scores indicate that a higher level of care is needed.
- Finnegan Abstinence Scoring is done after feeds, at 3 to 4 hour intervals, when the infant is awake. The score should represent the status of the infant both at the time of assessment, and during the preceding time period.
- **Developmental follow up is very important to minimize the impact of brain and motor delays during the first years of life.**

Preterm Infants/NICU admission:

In some studies, marijuana use was associated with a doubling of the risk for preterm birth. "Not only did continued use of marijuana increase risk for preterm birth, but it also made these births 5 weeks earlier, on average, with a greater number of women delivering very preterm," said senior researcher Claire Roberts, a professor at the University of Adelaide School of Pediatrics and Reproductive Health in Australia. (Study done in 2012).

Other studies have shown no such correlation, however infants did have a 50% chance of NICU admission when Marijuana was used during the pregnancy. The studies did not spell out the specific diagnoses that led to NICU admission.

References:

<https://www.dovepress.com/clinical-presentation-and-management-of-neonatal-abstinence-syndrome-a-peer-reviewed-fulltext-article-RRN>

<http://americanpregnancy.org/pregnancy-health/illegal-drugs-during-pregnancy/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262892/>

<http://www.medscape.com/viewarticle/768324>

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0039154>

<http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Marijuana-Use-During-Pregnancy-and-Lactation>

http://www.medscape.com/viewarticle/855638_3

<http://pediatrics.aappublications.org/content/134/2/e547>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4254522/>

Opioids Prenatal Management for Providers

Subsequent to the Drug Addiction Treatment Act of 2000 that allowed office-based treatment of addiction by using FDA schedule III to V drugs, the synthetic opioid buprenorphine (a partial μ -opioid agonist) was approved by the FDA in 2002 as a schedule III controlled substance for the treatment of opioid dependence.

- Neither methadone nor buprenorphine is approved for use in pregnant women, and both are categorized by the FDA as class C pregnancy drugs. Nonetheless, buprenorphine, either alone (Subutex) or in combination with naloxone (Suboxone), has been used both as a first-line treatment of heroin addiction and as a replacement drug for methadone.
- Recent results from the Maternal Opioid Treatment: Human Experimental Research studies suggest that buprenorphine has some advantages to methadone as a treatment of opioid addiction in pregnant women.
- Infants born to mothers treated with buprenorphine had shorter hospital stays (10 vs 17.5 days), had shorter treatment durations for NAS (4.1 vs 9.9 days), and required a lower cumulative dose of morphine (1.1 vs 10.4 mg) compared with infants born to mothers on methadone maintenance.

Clinical Symptoms in Neonates:

TABLE 1
Onset, Duration, and Frequency of NAS Caused by Various Substances

| Drug | Onset | Frequency | Duration |
|---------------------------------|-------------|-----------|-----------------------|
| Heroin | 24–48 hours | 40–80% | 8–10 days |
| Methadone | 48–72 hours | 13–94% | Up to 30 days or more |
| Buprenorphine | 36–60 hours | 22–67% | Up to 28 days or more |
| Prescription opioid medications | 36–72 hours | 5–20% | 10–30 days |

The different time courses reflect variations in the half-lives of drug elimination. However, if 1 week or longer has elapsed between the last maternal opioid use and delivery of the infant, the incidence of neonatal withdrawal is relatively low.

- **Neurologic Excitability**
 - Tremors, Irritability, Increased wakefulness, High-pitched crying, Increased muscle tone, Hyperactive deep tendon reflexes, Exaggerated Moro reflex, Seizures, Frequent yawning and sneezing
- **Gastrointestinal Dysfunction**

- Poor feeding, Uncoordinated and constant sucking, Vomiting, Diarrhea, Dehydration, Poor weight gain,
- **Autonomic signs:**
 - Increased sweating, Nasal stuffiness, Fever, Mottling, Temperature instability

The severity of symptoms of Neonatal Abstinence Syndrome depend on:

- The type of drug the mother used
- How the mother's body breaks down the drug
- How much of the drug she was taking
- How long she used the drug
- Whether the baby was born full-term or early (premature)

How often are meds required for withdrawal?

Approximately 50–75 percent of infants born to women on opioids will require treatment for opioid withdrawal. See table above.

Management

At the delivery of a known opioid-dependent woman, naloxone should be avoided in resuscitation of the infant as it may precipitate seizures.

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until/unless Finnegan scores indicate that a higher level of care is needed.
- Women on methadone or buprenorphine maintenance therapy are encouraged to breastfeed their infants, providing they are HIV negative (McCarthy J, 2000) (Substance Abuse and Mental Health Services Administration, Treatment Improvement Protocols, 2004).
- Finnegan Abstinence Scoring is done after feeds, at 3 to 4 hour intervals, when the infant is awake. The score should represent the status of the infant both at the time of assessment, and during the preceding time period.
- Quantifying the severity of NAS assists in determining if and when pharmacological intervention will be needed. Scoring also assists in monitoring, titrating, and terminating therapy.
- If abstinence scores are over 8 for 3 consecutive exams, the infant should be transferred to the NICU/Special Care Nursery for treatment and monitoring.
- Infants may require intravenous fluids to maintain hydration.
- Caloric expenditure is frequently elevated, and therefore increasing the caloric density of feeds may be indicated.
- Pharmacologic therapy is indicated for infants with increasing severity of signs and in cases of significant vomiting, diarrhea, or excessive weight loss.
- Infants may be treated with a variety of medications including short-acting opioids such as morphine sulfate and long-acting opioids such as methadone (AAP Committee on Drugs. Neonatal Drug Withdrawal. Pediatrics 1998;101;1079-1088).
 - Methadone may be continued and weaned as an outpatient.

- Morphine sulfate should be restricted to hospitalized infants and weaned completely prior to discharge home. *The weaning process is completely dependent on the individual and may take weeks to complete.*

Preterm Infants

Preterm infants have been described as being at lower risk of drug withdrawal with less severe and/or prolonged courses. Infants born at <35 weeks gestation whose mothers received methadone maintenance had significantly lower total and CNS abstinence scores than did term infants of mothers receiving similar methadone dosages. In a more recent study, lower gestational age correlated with a lower risk of neonatal withdrawal.

The apparent decreased severity of signs in preterm infants may relate to:

- developmental immaturity of the CNS
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- lower fat depots of drug
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In a retrospective study, Dysart et al compared the length of hospital stay, duration of medication, and cumulative medication exposure for preterm and term infants born to mothers enrolled in a methadone maintenance program. Infants were evaluated by using an abstinence scoring system and treated uniformly with a neonatal opiate solution. All adverse outcomes were reduced in the preterm cohort.

References:

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http://www.pqcnc.org/documents/nas/nasresources/VCHIP_5NEONATAL_GUIDELINE_S.pdf

PCP (Angel Dust) and LSD Prenatal Management for Providers (Hallucinogens)

Hallucinogens are drugs that can cause a change in the user's mental state to the point where the perception of objective reality is distorted. These drugs are sometimes referred to as illusionogenic, psychedelic, or mind-expanding, and have long been used in cultural and religious contexts. Hallucinogens vary greatly in chemical structure, and can exist naturally or be produced synthetically. For example, Lysergic Acid Diethylamide (LSD) was first synthesized in Europe in the late 1930s. There was little recognition that certain drugs had hallucinogenic properties in modern society until research began on the therapeutic effects of LSD in the 1950s. Hallucinogens were widely used in the youth culture of the 1960s and 1970s, and during the 1980s, their popularity declined. Some recent studies have indicated that hallucinogen use is again on the rise.

Peyote is a button from the cactus that is used by some Native American tribes as part of religious ceremonies. It is used in the Native American Church during ceremonies for healing, birth or death. The NAC has branches in Tucson and several in northern Arizona. In addition, many tribes across the south and plains have used Peyote in ceremonies.

Prenatal Management:

It is safe to stop amphetamines, ecstasy, cannabis and LSD during pregnancy. It's hard to know exactly how club drugs affect pregnancy. Pregnant women who take club drugs often drink alcohol or smoke. So it's hard to know which of these activities is responsible for certain pregnancy problems. But using any kind of street drug during pregnancy may cause serious problems, including:

- Premature birth
- Increased risk of miscarriage
- Low birthweight
- Neonatal abstinence syndrome (also called NAS)
- Sally Long (1972) examined the reports of 162 children of parents who took LSD before or during pregnancy. Of these children, seven were thought to have defects that could potentially be attributed to LSD intake. These included mostly cases of limb defects and one case of megacolon. Another series of cases reported by Jacobson et al (1972) included reports of sacral myelomeningocele, heart defects, including tetralogy of Fallot and an AV malformation, various limb defects and hydrocephalus. It was also speculated at the time that LSD could directly alter DNA and result in cellular abnormalities. Apple et al (1974) observed an exposed fetus with extensive ocular malformations (including marked cortical degeneration of the left eye lens and partial opaqueness of the cornea) and anencephaly.
- However, there is no solid epidemiological evidence of a cause-and-effect relationship between LSD use and congenital anomalies (McGlothlin et al, 1970). The greatest drawback to the aforementioned studies on LSD and hallucinogens

in general is that people who use LSD as a recreational drug during pregnancy are more likely to use other drugs as well (e.g., cannabis, alcohol, tobacco), more likely than someone in the average population to have infectious diseases such as gonorrhea and hepatitis, and more likely to be exposed to additional risk factors that could also have an adverse effect on pregnancy. *Since the 1970s, there have been few studies done on the teratogenic effects of LSD.*

There is a lack of epidemiological evidence showing that hallucinogens adversely affect pregnancy outcome. Therefore, risk assessments cannot be made with any certainty. In the case of MDMA and PCP, studies are still in progress that may better characterize fetal effects. Other drugs, e.g. LSD, have not been studied over the past decades. Individuals using hallucinogens during pregnancy are often exposed to additional risk factors, making counseling difficult. The avoidance of these substances during pregnancy should be stressed.

Clinical Symptoms in Neonates:

The following possible effects of hallucinogens on the newborn have been reported:

- increased reflexes/depressed grasp and rooting reflexes
- low birth weight/intrauterine growth restriction
- meconium-stained amniotic fluid
- jitteriness/tremors
- poor attention
- irritability, which may alternate with lethargy
- bizarre eye movements/staring episodes
- hypertonicity or hypotonicity
- sudden, rapid change in level of consciousness
- diarrhea
- vomiting
- withdrawal symptoms (jitteriness, hypertonicity, irritability)
- brain damage
- Effects of PCP exposure during pregnancy have a noted effect on the child as he or she matures. For example, the child may have temperament and sleep problems.
- Phencyclidine taken late in pregnancy appears to cause withdrawal symptoms in newborns. It may also lead to intrauterine growth retardation, pre-term delivery, meconium staining and poor ability to console. Studies are generally based on fewer than 10 infants, and the mothers are usually heavy users of other drugs, making interpretation difficult.

Management:

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until/unless Finnegan scores indicate that a higher level of care is needed.
- In the presence of symptoms, the infant should be transferred to the NICU/Special Care Nursery for treatment and monitoring.
- Infants may require intravenous fluids to maintain hydration.

- Caloric expenditure is frequently elevated, and therefore increasing the caloric density of feeds may be indicated.
- Pharmacologic therapy is indicated for infants with increasing severity of signs and in cases of significant vomiting, diarrhea, or excessive weight loss.
- Infants may be treated with a variety of medications including short acting opioids such as morphine sulfate and long-acting opioids such as methadone.
 - Methadone may be continued and weaned as an outpatient.
 - Morphine sulfate should be restricted to hospitalized infants and weaned completely prior to discharge home. *The weaning process is completely dependent on the individual and may take weeks to complete.*

Preterm Infants:

The constellation of complications will depend on the gestation at birth.

Breastfeeding:

AAP 2001: The Committee on Drugs strongly believes that nursing mothers should not ingest drugs of abuse (Amphetamine, Cocaine, Heroin, Marijuana, Phencyclidine) because they are hazardous to the nursing infant and to the health of the mother.

Per the CDC: Breastfeeding is NOT advisable if the following condition is true:
The infant whose mother is using or is dependent upon an illicit drug.

Resources for patients:

- National Council on Alcoholism and Drug Dependence
(800) 622-2255
- Substance Abuse Treatment Facility Locator
(800) 662-4357
- <http://nativemothering.com/2011/05/should-i-use-peyote-if-i-am-pregnant-or-breastfeeding/>

References:

<http://fetal-exposure.org/the-effects-of-hallucinogen-use-during-pregnancy/> This contains information specific to many hallucinogenic drugs including nutmeg, LSD, mescaline, **Psilocybin**, **Dimethyltryptamine (DMT)**, **Phencyclidine (PCP)**, and MDMA (Ecstasy).

<http://nativemothering.com/2011/05/should-i-use-peyote-if-i-am-pregnant-or-breastfeeding/> : well referenced and culturally sensitive information for the Native woman on the use of peyote during pregnancy and breastfeeding.

<http://pediatrics.aappublications.org/content/134/2/e547>

http://www.camh.ca/en/hospital/health_information/a_z_mental_health_and_addiction_information/hallucinogens/Pages/default.aspx

<http://www.drugaddictiontreatment.com/types-of-addiction/designer-drugs/effects-of-mdma-ecstasy-use-during-pregnancy/>

<http://www.idph.state.il.us/about/epi/pdf/Epi01-4.pdf>

<http://www.livescience.com/18943-ecstasy-pregnancy-development.html>

<http://www.marchofdimes.org/pregnancy/ecstasy-methamphetamine-and-other-amphetamines.aspx>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262892/>

https://www.westernschools.com/Portals/0/html/H8397/GNn_Yx_files/OEBPS/Text/N1445%20ebooks-4.html

www.cecentral.com/assets/2634/011-Bada.pp

Special K: Ketamine Prenatal Management for Providers

It's hard to know exactly how club drugs affect pregnancy. Pregnant women who take club drugs often drink alcohol or smoke. So it's hard to know which of these activities is responsible for certain pregnancy problems. But using any kind of street drug during pregnancy may cause serious problems, including:

- Premature birth. This is birth before 37 weeks of pregnancy.
- Low birthweight. This is when a baby is born weighing less than 5 pounds, 8 ounces.
- Neonatal abstinence syndrome (also called NAS). This is a group of conditions a newborn can have if his mother is addicted to drugs during pregnancy. NAS happens when a baby gets addicted to a drug before birth and then goes through drug withdrawal after birth.
- Hypotonia at birth, resolved by 21 days.
- Moderate cerebral dysfunction.

What is special K?

Special K is a white, crystal-like powder. It's usually eaten, snorted or injected with a needle. It can make users feel far away from what's going on around them and make them feel scared and anxious. It can cause health problems, including:

- High blood pressure
- Respiratory failure.
- Hallucinations
- Ketamine is known to cross the placenta to the developing fetus. In humans, it has been reported to cause increased muscle tone and slowed breathing in newborns when given before delivery. It may also increase the frequency and intensity of contractions, and raise blood pressure and heart rate in the mother.
- Large, repeated doses of ketamine may eventually cause 'ketamine bladder syndrome', a painful condition needing ongoing treatment. Symptoms include difficulty holding in urine, and incontinence, which can cause ulceration in the bladder. Anyone suffering from ketamine bladder syndrome needs to stop using ketamine and see a health professional - See more at: <http://www.druginfo.adf.org.au/drug-facts/ketamine#sthash.it8yYimh.dpuf>
- Because ketamine is a short-acting anesthetic, it is unlikely to produce newborn side effects unless given immediately prior to delivery

Clinical Symptoms in Neonates:

Similar to PCP.

The following possible effects of PCP on the newborn have been reported:

- increased reflexes/depressed grasp and rooting reflexes
- low birth weight/intrauterine growth restriction
- meconium-stained amniotic fluid
- jitteriness/tremors
- poor attention
- irritability, which may alternate with lethargy
- bizarre eye movements/staring episodes

- hypertonicity or hypotonicity
- sudden, rapid change in level of consciousness
- diarrhea
- vomiting
- withdrawal symptoms (jitteriness, hypertonicity, irritability)
- brain damage

How often are meds required for withdrawal?

No data available.

Management:

Supportive care is essential in the management of infants exhibiting signs of withdrawal.

- Decreased stimulation, swaddling, and frequent feedings on demand are beneficial.
- Barring other complications, the baby should remain with Mom until/unless Finnegan scores indicate that a higher level of care is needed.
- If the infant shows signs of withdrawal or increasing symptoms, they should be transferred to the NICU/Special Care Nursery for treatment and monitoring.
- Infants may require intravenous fluids to maintain hydration.
- Caloric expenditure is frequently elevated, and therefore increasing the caloric density of feeds may be indicated.
- Pharmacologic therapy is indicated for infants with increasing severity of signs and in cases of significant vomiting, diarrhea, or excessive weight loss.
- Infants may be treated with a variety of medications including short acting opioids such as morphine sulfate and long-acting opioids such as methadone (AAP Committee on Drugs. Neonatal Drug Withdrawal. Pediatrics 1998;101;1079-1088).
 - Methadone may be continued and weaned as an outpatient.
 - Morphine sulfate should be restricted to hospitalized infants and weaned completely prior to discharge home. *The weaning process is completely dependent on the individual and may take weeks to complete.*

Preterm Infants:

The extent of issues related to prematurity will of course depend upon the gestation at birth.

Breastfeeding:

AAP 2001: The Committee on Drugs strongly believes that nursing mothers should not ingest drugs of abuse, because they are hazardous to the nursing infant and to the health of the mother.

- Drugs of abuse for which adverse effects on the infant has been reported (Amphetamine, Cocaine, Heroin, Marijuana, Phencyclidine)

CDC: Breastfeeding is NOT advisable if the following condition is true:

- The infant whose mother is using or is dependent upon an illicit drug.

Resources for patients:

National Council on Alcoholism and Drug Dependence

<https://www.ncadd.org/>

(800) 622-2255

Substance Abuse Treatment Facility Locator

<https://findtreatment.samhsa.gov/>

(800) 662-4357

References:

<http://pain.emedtv.com/ketamine/ketamine-and-pregnancy.html>

<http://pediatrics.aappublications.org/content/134/2/e547>

<http://www.drugaddictiontreatment.com/types-of-addiction/designer-drugs/effects-of-mdma-ecstasy-use-during-pregnancy/>

<http://www.livescience.com/18943-ecstasy-pregnancy-development.html>

<http://www.marchofdimes.org/pregnancy/ecstasy-methamphetamine-and-other-amphetamines.aspx>

<http://www.sciencedirect.com/science/article/pii/S187595721060054X>

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SSRI's Prenatal Management for Providers

Selective serotonin reuptake inhibitors (SSRIs) are a class of antidepressant medications that became available for widespread clinical use in 1988. SSRIs (eg, **fluoxetine [Prozac], paroxetine [Paxil], sertraline [Zoloft], citalopram [Celexa], escitalopram [Lexapro], and fluvoxamine [Luvox]**) are now the most frequently used drugs to treat depression both in the general population and in pregnant women. SSRI treatment should be continued during pregnancy at the lowest effective dose, because withdrawal of medication may have harmful effects on the mother-infant dyad.

Onset, Duration, and Frequency of NAS Caused by Various Substances

| Drug | Onset | Frequency | Duration |
|-------|-------------|-----------|----------|
| SSRIs | 24–48 Hours | 20–30% | 2–6 days |

What did we already know?

Selective serotonin reuptake inhibitors (SSRIs) are medications used to treat depression and other mental health conditions. Previous studies provide conflicting evidence about potential links between the use of SSRIs during pregnancy and certain birth defects.

What does the latest CDC study show?

In a CDC study published in the BMJ, researchers re-assessed several previously reported links between SSRI use and birth defects using more recent data. These results reflect not only the new data, but also incorporate results from previously published independent studies. Researchers found some birth defects occur about two or three times more frequently among babies born to women who took certain SSRI medications, like **fluoxetine and paroxetine**, early in pregnancy. *However, links between birth defects and other SSRIs, like **sertraline**, were not observed in this CDC study.*

What were this study's main findings?

- Researchers investigated links reported in previous studies by combining those results with new data.
 - **Fluoxetine:** researchers observed fluoxetine to be linked with these two birth defects:
 - Heart defects with obstruction of the right ventricular outflow tract
 - Craniosynostosis
 - **Paroxetine:** paroxetine appeared to be linked with these birth defects:
 - Anencephaly
 - Atrial septal defects
 - Heart defects with obstruction of the right ventricular outflow tract
 - Gastroschisis
 - Omphalocele
 - **Sertraline:** Reassuringly, researchers did not confirm links between sertraline, the SSRI used most often, and any of the birth defects observed in previous studies.
- Despite the increased risks for certain birth defects from some SSRIs found in this study, the actual risk for a birth defect among babies born to women taking one of

these medications is still very low. Because these specific types of birth defects are rare, even doubling the risk still results in a low absolute risk.

Clinical Symptoms in Neonates:

Crying, irritability, tremors, poor suck, feeding difficulty, hypertonia, tachypnea, sleep disturbance, hypoglycemia, seizures. The onset of these signs ranged from several hours to several days after birth and usually resolved within 1 to 2 weeks. In 1 infant exposed to paroxetine, signs persisted through 4 weeks of age. In severely affected infants, a short-term course of chlorpromazine provided measurable relief of symptoms. Although 1 study reported decreased pain reactivity at 2 months of age in infants with prenatal exposure to SSRIs, several recent reviews have not identified adverse neurodevelopmental outcomes among infants born to women treated with SSRIs during pregnancy.

How often are meds required for withdrawal?

In the largest study found, none of the exposed infants with symptoms required treatment. In another smaller study 33% of patients required meds during withdrawal.

Management:

Clinicians should be aware that infants are at risk for manifesting clinical signs of drug toxicity or withdrawal over the first week of life and arrange for early follow-up after the initial hospital discharge.

Breastfeeding:

A mother on treatment with an SSRI who desires to nurse her infant should be counseled about the benefits of breastfeeding as well as the potential risk that her infant may continue to be exposed to a measureable level of the SSRI with unknown long-term effects.

References:

<http://pediatrics.aappublications.org/content/129/2/e540>

<http://pediatrics.aappublications.org/content/134/2/e547>

<http://www.webmd.com/parenting/baby/news/20060206/infants-antidepressant-withdrawal#2>

<https://www.cdc.gov/pregnancy/meds/treatingfortwo/index.html>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2672676/>

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<http://americanpregnancy.org/pregnancy-health/illegal-drugs-during-pregnancy/>

Web site intended for use by the pregnant woman. Good information, frightening pictures of a woman with a needle full of drugs.

<http://ecstasy.org/info/pregnancy.html>

ecstasy.org aims to gather and make accessible objective, authoritative, and up to date information about the drug ecstasy (principally MDMA). The site is non-profit making and is maintained by volunteers. Sources are not listed. MDMA psychotherapy research, sponsored by the non-profit Multidisciplinary Association for Psychedelic Studies (MAPS), has been approved in the United States, Switzerland and Israel. For information about the research and for an updated review of the scientific literature on MDMA, see maps.org. The bulk of the material on ecstasy.org should now be considered as 'archive'. This means that it is no longer being updated regularly and may be out of date. Users of the site should proceed with caution as some of the information should be read for historical interest only.

<http://fetal-exposure.org/the-effects-of-hallucinogen-use-during-pregnancy/>

This contains information specific to many hallucinogenic drugs including nutmeg, LSD, mescaline, **Psilocybin**, **Dimethyltryptamine (DMT)**, **Phencyclidine (PCP)**, and MDMA (Ecstasy).

<http://healthland.time.com/2012/01/30/updated-guidelines-for-treating-babies-exposed-to-drugs-in-the-womb/>

Time Magazine review of current treatment of NAS. Not well sourced.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0039154>

To identify risk factors for spontaneous preterm birth (birth <37 weeks gestation) with intact membranes (SPTB-IM) and SPTB after prelabour rupture of the membranes (SPTB-PPROM) for nulliparous pregnant women. Over 3000 women in study, well referenced. Marijuana use was a risk factor for early birth.

<http://nativemothering.com/2011/05/should-i-use-peyote-if-i-am-pregnant-or-breastfeeding/>:

Well referenced and culturally sensitive information for the Native woman on the use of peyote during pregnancy and breastfeeding.

<http://pediatrics.aappublications.org/content/101/6/1079>

Maternal drug use during pregnancy may result in neonatal withdrawal. This statement presents current information about the clinical presentation, differential diagnosis, therapeutic options, and outcome for the offspring associated with intrauterine drug exposure.

<http://pediatrics.aappublications.org/content/129/2/e540>

Maternal use of certain drugs during pregnancy can result in transient neonatal signs consistent with withdrawal or acute toxicity or cause sustained signs consistent with a lasting drug effect. In addition, hospitalized infants who are treated with opioids or

benzodiazepines to provide analgesia or sedation may be at risk for manifesting signs of withdrawal. This statement updates information about the clinical presentation of infants exposed to intrauterine drugs and the therapeutic options for treatment of withdrawal and is expanded to include evidence-based approaches to the management of the hospitalized infant who requires weaning from analgesics or sedatives.

<http://pediatrics.aappublications.org/content/134/2/e547>

Withdrawal from licit or illicit substances is becoming more common among neonates in both developed and developing countries. NAS leads to a constellation of signs and symptoms involving multiple systems. The Finnegan scoring system is commonly used to assess the severity of NAS; scoring can be helpful for initiating, monitoring, and terminating treatment in neonates. Nonpharmacological care is the initial treatment option, and pharmacological treatment is required if an improvement is not observed after nonpharmacological measures or if the infant develops severe withdrawal. Morphine is the most commonly used drug in the treatment of NAS secondary to opioids. An algorithmic approach to the management of infants with NAS is suggested. Breastfeeding is not contraindicated in NAS, unless the mother is taking street drugs, is involved in polydrug abuse, or is infected with HIV. Future studies are required to assess the long-term effects of NAS on children after prenatal exposure.

<http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Marijuana-Use-During-Pregnancy-and-Lactation>

Cannabis sativa (marijuana) is the illicit drug most commonly used during pregnancy. The self-reported prevalence of marijuana use during pregnancy ranges from 2% to 5% in most studies. A growing number of states are legalizing marijuana for medicinal or recreational purposes, and its use by pregnant women could increase even further as a result. Because of concerns regarding impaired neurodevelopment, as well as maternal and fetal exposure to the adverse effects of smoking, women who are pregnant or contemplating pregnancy should be encouraged to discontinue marijuana use. Obstetrician–gynecologists should be discouraged from prescribing or suggesting the use of marijuana for medicinal purposes during preconception, pregnancy, and lactation. Pregnant women or women contemplating pregnancy should be encouraged to discontinue use of marijuana for medicinal purposes in favor of an alternative therapy for which there are better pregnancy-specific safety data. There are insufficient data to evaluate the effects of marijuana use on infants during lactation and breastfeeding, and in the absence of such data, marijuana use is discouraged.

http://www.camh.ca/en/hospital/health_information/a_z_mental_health_and_addiction_information/hallucinogens/Pages/default.aspx

Canadian website primarily for patients. Centre for Addiction and Mental Health. Also has specific pages for Opioids, Cannabis, Ecstasy, Ketamine, and LSD as well as other specific mental health issues. Information clear and concise.

<http://www.drugaddictiontreatment.com/types-of-addiction/designer-drugs/effects-of-mdma-ecstasy-use-during-pregnancy/>

Consumer focused web site featuring articles on various issues related to drugs and addiction. Information is clear and well-referenced.

<http://emedicine.medscape.com/article/978763-treatment>.

“Neonatal Abstinence Syndrome Treatment & Management”. Free subscription required. Well referenced data for the provider who seeks in-depth information.

<http://www.idph.state.il.us/about/epi/pdf/Epi01-4.pdf>

A study from 1991-1999 looked at drug use amongst pregnant women in Illinois. Data rich, but dated.

<http://www.livescience.com/18943-ecstasy-pregnancy-development.html>

“Ecstasy in Pregnancy Is Bad for Baby, Study Finds”. Web editorial that discusses a Case Western study on impact of ecstasy on pregnancy.

<http://www.marchofdimes.org/pregnancy/ecstasy-methamphetamine-and-other-amphetamines.aspx>

Reputable and reliable source for patients. Web site has information about many other drugs available in an easy to surf web site. The March of Dimes also has an extensive section for professionals.

<http://mothertobaby.org/>

MotherToBaby affiliates around the world provide the most cutting-edge and up-to-date information about the risks of medications, chemicals, herbal products, illicit drugs, diseases and much more during pregnancy and while breastfeeding. **OTIS** (Organization of Teratology Information Specialists) and its information service, **Mother To Baby**, are suggested resources by many agencies including the Centers for Disease Control and Prevention (CDC). More than 100,000 women and their health care providers seek information about birth defect prevention from OTIS and Mother To Baby every year. Site has fact sheets on specific drugs, medications and herbs. Fact sheets are available in Spanish as well as English.

<http://www.medscape.com/viewarticle/768324>

“Marijuana Use Linked to Increased Risk for Preterm Birth”. Study group of over 3000 women. Marijuana use was associated with a doubling of the risk for preterm birth.

http://www.medscape.com/viewarticle/855638_3

“Association Between Marijuana Use and Adverse Obstetrical and Neonatal Outcomes”. **Objective:** To evaluate associations between marijuana exposure and adverse outcomes excluding women with polysubstance abuse and stratifying for concurrent maternal tobacco use. **Conclusion:** Maternal marijuana use does not increase the risk of adverse obstetrical outcomes or fetal anomalies, but does increase the risk for small for gestational age and neonatal intensive care unit admission.

<http://www.narconon.org/drug-abuse/cocaine/harm-to-unborns-and-infants.html>

A commercial website for a drug treatment program, there is evidenced-based information directed toward the drug user. This treatment program was started by L. Ron Hubbard.

<http://pediatrics.aappublications.org/content/129/2/e540>

This statement updates information about the clinical presentation of infants exposed to intrauterine drugs and the therapeutic options for treatment of withdrawal and is expanded to include evidence-based approaches to the management of the hospitalized infant who requires weaning from analgesics or sedatives. Provides a general overview of NAS for the provider.

<http://pediatrics.aappublications.org/content/134/2/e547>

This review provides a summary of the history, epidemiology, pathophysiology, clinical presentation, toxicology confirmation, and treatment of NAS. Implications for breastfeeding and follow-up are discussed.

http://www.pqcnc.org/documents/nas/nasresources/VCHIP_5NEONATAL_GUIDELINE_S.pdf

The management of Neonatal opioid withdrawal was created to provide Vermont practitioners with the consolidated set of recommendations for the management of the opioid exposed newborn. The content is intended to complement standard medical care, the Vermont Buprenorphine Practice Guidelines, and other resources available through the American Academy of Pediatrics (www.aap.org), Substance Abuse and Mental Health Services Administration (www.samhsa.gov) and the Center for Substance Abuse Treatment (www.csat.samhsa.gov). These guidelines are not intended as requirements for practitioners.

<http://www.webmd.com/parenting/baby/news/20060206/infants-antidepressant-withdrawal#2>

Web article referencing two studies on SSRI's and pregnancy. Concludes that transient withdrawal may be present in about 30% of infants, but the risks of maternal depression must be weighed when deciding to continue the meds or not.

<https://pharmacymp.az.gov/>

To review the Controlled Substance Prescription Monitoring Program (CSPMP) for all pregnant members. Requires registration.

<https://www1.maine.gov/dhhs/mecdc/documents/SnuggleME-Project.pdf>

A guide for providers outlining treatment and education suggested at each point in the pre and post natal course.

<https://www.cdc.gov/pregnancy/meds/treatingfortwo/index.html>

The CDC has an excellent collection of resources for providers and patients. Includes an extensive section of full text articles, and another section with data on both therapeutic and illegal drug use during pregnancy. Easy to navigate.

<https://www.dovepress.com/clinical-presentation-and-management-of-neonatal-abstinence-syndrome-a-peer-reviewed-fulltext-article-RRN>

Exposure to prescription medications and illicit drug use during pregnancy has been associated with neonatal abstinence syndrome. The clinical presentation consists of neurological respiratory, gastrointestinal, and vasomotor disturbances. All infants require observation and supportive care to ensure appropriate adaptation and growth in the newborn period. A smaller percentage may also require additional pharmacotherapy, depending on the specific gestational substance exposure. Women should be counseled antenatally about the possible neonatal effects, and mother–baby dyad care should be implemented for this particular patient population. Addresses: neonatal withdrawal, opioids, marijuana, cocaine, benzodiazepines, selective serotonin reuptake inhibitors

<https://www.evidence.nhs.uk/search?q=neonatal%20abstinence>.

A master list of annotated research pertaining to NAS.

<https://www.ncbi.nlm.nih.gov/books/NBK64744/>

Well referenced textbook. The chapter cited deals with opioid and cocaine use and treatment of infants born to users. SAMHSA.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2672676/>

“Neonatal effects of exposure to selective serotonin reuptake inhibitors during pregnancy”. A small study referenced by other sources on SSRI impact on infants.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4254522/>

“It’s Not Your Mother’s Marijuana: Effects on Maternal-Fetal Health and the Developing Child”. Pro-marijuana advocacy efforts exemplified by the “medical” marijuana movement, coupled with the absence of conspicuous public health messages about the potential dangers of marijuana use during pregnancy, could lead to greater use of today’s more potent marijuana, which could have significant short- and long-term consequences. This article reviews the current literature regarding the effects of prenatal marijuana use on the pregnant woman and her offspring. Well-sourced.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4262892/>

“Developmental Consequences of Fetal Exposure to Drugs: What We Know and What We Still Must Learn”. Describes current knowledge on how alcohol, nicotine, cocaine, amphetamine, Ecstasy, and opiates (among other drugs) produce alterations in neurodevelopmental trajectory. Comprehensive sections on each drug are presented. Well-sourced.

<https://www.pediatricnursing.net/ce/2016/article40051.pdf>

“Evidenced-Based Interventions for Neonatal Abstinence Syndrome”. Purpose: to determine best nursing practice by systematically and critically reviewing the appropriate literature and expert guidelines. Results of the comprehensive review showed that traditional supportive interventions also have a body of evidence for their

use. Although there is much research regarding neonatal abstinence syndrome (NAS), the majority of future research needs to be at a higher level of evidence. Nursing applications include obtaining evidence for best practice through diligent searches of the literature and expert guidelines.

https://www.westernschools.com/Portals/0/html/H8397/GNn_Yx_files/OEBPS/Text/N1445%20ebooks-4.html

“Fetal and Neonatal Drug Exposure, 2nd Edition”. Web based education. This course provides information on newborns who have been exposed to opiates, stimulants, marijuana, phencyclidine (PCP), nicotine, inhalants, or sedative-hypnotics in utero. The purpose of this course is to provide nurses with the knowledge to educate pregnant women about substance use, assess newborns for signs of prenatal exposure to maternal drug use, and provide needed interventions for these newborns. The overall goal of this course is to provide a knowledge base for nurses who care for pregnant women in antenatal, intrapartum, and postpartum areas, and those who care for newborns in any setting

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Powerpoint “Narcotic Withdrawal Syndrome. Neonatal Abstinence Syndrome”. Summary states: May need universal screening for in utero drug exposure; Mother will need management (address medical, drug rehabilitation, multiple social issues); Non-judgmental approach; Baby will need monitoring and supportive treatment; Need for pharmacologic treatment will depend on type of drug exposure and manifestations of withdrawal; Promote child growth, health, and safety; Direct treatment or management to child and family. Contains nice graphs and graphics.

<https://www.drugabuse.gov/drugs-abuse>

Learn the facts about the most commonly abused drugs. Each drug page includes a brief overview, street and clinical names, the effects of the drug on the brain and body, statistics and trends, and relevant publications and articles written by NIDA researchers and scientists.