

Am I Pregnant?

Carrie called MotherToBaby on a Monday morning. She sounded anxious. “I just got home from a pretty wild bachelorette party held last week in New Orleans. I started feeling nauseous on the plane and I have thrown up twice this morning. I couldn’t eat breakfast. I’m really tired and my breasts hurt a little. I’m worried I might be pregnant.” Carrie was wondering if we could help her figure out if she was pregnant or not. Although MotherToBaby mainly answers questions about medications and other exposures during pregnancy and breastfeeding, the “am I pregnant” question is one we hear often.

This call reminded me of another one that I received several weeks prior – Anya called to say that she was two days late for her period, but she hadn’t been able to take a pregnancy test just yet. She was taking birth control pills and had missed one day but took two pills the next day, just like her doctor had told her to do if that happened. She was hoping she wasn’t pregnant, but she was worried that taking the birth control pills may have increased the chance for a birth defect in her baby if she was pregnant.

January is National Birth Defects Awareness Month, and a great time for those planning a pregnancy to review their own risk for having a child with a birth defect. Over half of all pregnancies in this country are unplanned. Talk with one of our specialists. Together with MotherToBaby, you can consider your own risk in a thorough discussion. Also see [this link](#) to the CDC page on birth defects prevention.

Back to our callers’ situations. There are many signs of early pregnancy and they may be different from person to person. Yet there can be other reasons a person might have any of these symptoms, which is why it’s important to perform a pregnancy test. The following symptoms could be side effects from hormonal contraception OR early signs of illness OR your period is about to start OR actually signs of pregnancy. These include light vaginal bleeding or spotting, mild uterine cramping, sore or swollen breasts, feeling tired, feeling bloated, feeling moody, urinating more often than usual, food aversions, nausea or vomiting, constipation, stuffy or runny nose. Even a missed period might not mean you are pregnant.

If you think you may be pregnant, the best way to know for sure is to take a pregnancy test. Home pregnancy tests, sold at grocery stores, pharmacies and drugstores, are about 90% accurate on the day you are supposed to have your period. If you wait just one more week, the tests are reported to be about 97-99% accurate. Taking a test sooner than the day your period is supposed to start can lead to false negative results. How? Pregnancy tests measure a hormone called human chorionic gonadotropin (hCG) in your urine and your body only makes this hormone if you’re pregnant. Your body makes more hCG as time passes though, and your test could be negative if there isn’t enough hCG to measure in your urine yet. Home urine pregnancy tests are just as accurate as the urine tests at the doctor’s office when they are used correctly and at the right time in your menstrual cycle. Before you begin, make sure to check the expiration date on the outside of the box. Carefully read the instructions. If you still aren’t sure about the result, visit a clinic to be tested again.

While a woman waits until the day she can take a pregnancy test, meaning until she knows for certain whether or not she is pregnant, it’s important to avoid **alcohol**, **smoking**, and drugs. All of these substances can be harmful to a pregnancy and to a developing baby. MotherToBaby is an excellent resource for discussing these exposures during pregnancy, plus for any medications you might be taking. This conversation can be useful in making decisions with your doctor about continuing or stopping a medication. In some cases, it may actually be better to continue taking certain medicines, for both your own health and the baby’s well-being. Don’t stop your medications until you speak with your doctor or pharmacist.

If your period has not started within a week after a negative result, you should take another pregnancy test. If it's still negative, make an appointment with your healthcare professional to determine what may be going on. You might be stressed, be exercising too much, getting sick or experiencing hormonal imbalances. All of these should be discussed with a doctor. If you are not pregnant, it's also an excellent time to discuss short-term birth control or long-acting reversible contraception (LARC) like IUDs or birth control implants. No contraceptive method is 100% effective, and I've spoken with people who became pregnant even with LARC, but the chance of an unplanned pregnancy is far less with correct use of contraception with every sexual act. It's also a good idea to start tracking your periods to learn more about your body and to know when to expect your period. Check out your app store for free apps like: Flo, Clue Period & Cycle Tracker, or Ovia Fertility & Cycle Tracker.

If your home pregnancy test is positive, make an appointment with your healthcare provider. The sooner your pregnancy is confirmed, the sooner you can begin prenatal care. Either before or when you suspect a pregnancy, begin taking a daily prenatal vitamin with at least 400mcg of folic acid. These help support the baby's growth and development and are an important supplement to a good nutritious diet. Check to see if you are up to date on all recommended vaccines. Get some exercise, plenty of sleep, and pay attention to your mental health. See our [healthy pregnancy blog](#) post for more details. MotherToBaby is here to help with any questions you have throughout pregnancy and while breastfeeding.

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at [MotherToBaby.org](https://www.MotherToBaby.org).

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As the coronavirus that causes COVID-19 continues to spread, pregnant and breastfeeding women are understandably concerned. Many of your recent calls, chats, texts, and emails to MotherToBaby have been about the virus itself and how it might affect a developing baby or breastfed infant (more about that on our [COVID-19 fact sheet](#)). But we're also hearing related concerns about how to stay safe and healthy while pregnant or breastfeeding during the pandemic. Here, we answer some of the most common questions we're getting during this uncertain time:

FAQs

Can I use supplements to boost my immunity?

We're receiving even more inquiries than usual about using supplements such as elderberry, zinc, and vitamin C to "boost immunity." Unfortunately, there is no good data to suggest that these supplements have a protective effect against coronavirus. Additionally, the use of supplements in pregnancy and lactation comes with potential concerns.

The first concern is the lack of regulation. Dietary supplements do not require the same oversight by the Food and Drug Administration (FDA) as medications do, which means that supplement manufacturers do not have to prove the safety and effectiveness of their products before they hit the shelves. Supplements may be contaminated with other ingredients (such as prescription medications or lead), and differences may be found between the amount or ingredient listed on the label and what is actually in the product.

The second concern about supplements is that usually they are not well studied for use in pregnancy and lactation. Without good research, we just don't know how something like elderberry might affect a developing baby or breastfed infant. Mega-doses of any vitamin (like the 1000 mg of vitamin C commonly found in some supplements) are of particular concern as they are much higher than what is recommended for pregnant or breastfeeding women in a single day. Generally speaking, if you are eating a healthy diet and taking a prenatal vitamin, you are probably covering all your vitamin and mineral needs. Taking additional supplements might present increased risks to your pregnancy or your breastfed baby, with no clear evidence that they would effectively boost your immunity. You can read more on our [Herbal Products Fact Sheet](#).

Are cleaning products safe for me and my baby?

The Centers for Disease Control and Prevention (CDC) recommend **cleaning and disinfecting** high-touch surfaces as one way to help prevent exposure to the virus. This means wiping down doorknobs, light switches, desks, faucets, electronics, and more... but does all this exposure to cleaning products increase risks to a pregnancy or a breastfed baby?

Our previous Baby Blog on [household cleaners](#) explains that when you use cleaning products as directed, the actual exposure to your developing baby or breastfed infant is likely to be quite low. Even if you can smell the fumes, brief inhalation while cleaning generally won't allow for much absorption of these kinds of compounds into your blood. Likewise, your skin is a surprisingly good barrier that prevents significant absorption of cleaning products through the skin. Any chemicals that might get into your blood through inhalation or skin contact typically won't reach the developing baby or get into your breastmilk in any meaningful quantity. Working in a ventilated area and wearing gloves when using cleaning products can further reduce your exposure, and help prevent respiratory and skin irritation. And of course, wash your hands after cleaning.

Should I still go to my prenatal appointments?

You've read you should stay home as much as possible since this virus can spread easily from person to person. This is true, but your prenatal appointments are still important! These visits are vital opportunities for your provider to assess

the health of your pregnancy and identify any issues that might affect you or your developing baby. Some healthcare providers are offering **some** appointments virtually (over the internet) or spreading out the time between appointments a bit longer than normal. But sometimes you will have to be seen in person, especially for screenings, labs, and vaccines, such as the **flu shot** and **Tdap** vaccine that help protect both mom and baby against serious illness.

If you haven't already, talk to your pregnancy care provider about any changes to your upcoming appointments. For virtual visits, ask what technology (phone, laptop, etc.) you will need to connect with your provider, and write down a list of questions so you don't forget to ask anything. Just like a regular appointment, it can be helpful to have someone "come along" virtually to help make sure all your concerns are addressed. For in-person visits, your provider may ask that you come alone (no partner, no kids). While there, try to stay at least 6 feet away from other patients in the waiting room, wear a **cloth face cover**, and don't forget to wash your hands! For more prevention tips, check out guidance from the CDC [here](#).

Why have they delayed my fertility procedure?

Many kinds of medical procedures are being put on hold as a way to help prevent the spread of coronavirus and reserve essential medical supplies for critical medical care. For this reason, the **American Society for Reproductive Medicine** has made the difficult decision to suspend initiation of new treatment cycles (intrauterine insemination or IUI and in vitro fertilization or IVF) for the time being. We completely empathize with anyone who gets this news. When you've been trying to get pregnant and each passing month feels like another missed opportunity, a setback like this is the last thing you want. During this difficult but necessary delay, make sure to continue practicing healthy habits like staying active, avoiding **alcohol**, and taking a prenatal vitamin with at least 400 mcg of **folic acid** every day. That way, you'll be ready to go once you get the green light that IUI and IVF treatments are back on.

I still have to go to work every day. What can I do to avoid getting COVID-19?

If you aren't able to work from home, you might be worried that going in to work could increase your chance of contact with the virus. How true this is might depend on your job situation. If you have contact with the public at work and you are pregnant or breastfeeding, you could talk to your employer about being temporarily reassigned to another role that limits your contact with other people. However, not every workplace will be able to accommodate this request. CDC **workplace recommendations** for everyone include strategies such as not shaking hands, wiping down frequently-touched surfaces, limiting in-person meetings, maintaining at least 6 feet of distance between you and people with whom you need to interact, not sharing food, and of course, staying home if you are sick. In addition, CDC guidelines recommend wearing a **cloth face covering** when you may be near other people to help reduce the spread of the virus.

If you are a pregnant healthcare worker, be sure your employer knows you are pregnant before you provide any direct patient care to a person with confirmed or suspected COVID-19. When possible, and depending on staffing needs, management should **consider limiting your exposure** to these patients. This is especially true if you perform procedures with a higher chance of coming into contact with a patient's respiratory droplets (such as intubation). If you do provide care to a patient with confirmed or suspected COVID-19, be sure to follow the **Infection Control** guidelines for all healthcare personnel. Our fact sheet on **Reproductive Hazards of the Workplace** can answer additional questions about staying safe at work during pregnancy and while breastfeeding.

I'm stressed! Can this affect my pregnancy?

With the constant news stream about the pandemic, it can be tough not to feel anxious or depressed during this time. Plus, social distancing means that many women are separated from their support network of friends and family members. Add in trying to work from home with a partner and/or kids, and it's easy to see why many women are feeling stressed out! We discussed mental health and COVID-19 at length in our recent podcast episode, which you can listen to [here](#).

One big takeaway from the podcast? Some studies suggest that ongoing **stress** and uncontrolled **depression** or **anxiety** during pregnancy can increase the chance of outcomes such as preterm birth and low birth weight. So, if you feel like your mental health is suffering because of this pandemic, we encourage you to reach out to your healthcare provider (maybe virtually!) to figure out the best approach for treatment. Some women can benefit from making simple changes in their daily habits (like watching less news and getting more fresh air), while others might need to use a medication to help manage their symptoms. If that's the case, MotherToBaby can share with you what is known about your particular antidepressant or anti-anxiety medication in pregnancy and/or lactation.

Whatever your concerns about COVID-19 or other exposures might be, please know that MotherToBaby is here for you with evidence-based answers. Please **reach out to us** with your questions. We're all in this together.

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By Kurt Martinuzzi, MD, Asst. Professor in the Dept of Ob/Gyn at Emory University and Claire D. Coles, PhD, MotherToBaby Georgia Director

Aryan* and Shanaya had been married for two years and very much wanted to start a family. When they were not successful at getting pregnant, they were tested for fertility (all tests came back as normal) and months of expensive medical treatments were tried without success. Emotionally and financially spent, the couple sought the counsel of friends and family. A childhood friend from India recommended an over-the-counter herbal fertility supplement called **vasantha kusumakaram**. The product is described as being “100% natural” so she was certain that it must be safe. Shanaya took this daily for 5 months and hoped for a baby.

In India, the traditional approach to medical care is referred to as **ayurvedic medicine**. In this 2000-year-old tradition, naturally occurring herbs are mixed with other substances and are prescribed for a range of symptoms. Vasantha kusumakaram is reported to be a treatment for many illnesses and problems including diabetes, lung, heart and kidney diseases as well as heavy periods, impotence and tuberculosis. It is also felt by some to be an aphrodisiac!

During the months that Shanaya took the herbal treatment she did not become pregnant. Eventually, her husband suggested checking in again with her primary health care provider because she had started to suffer from abdominal pain, constipation, fatigue and loss of appetite. At that return visit, her blood pressure was surprisingly elevated and her blood count was low (anemia)...the combination of symptoms was a dead ringer for lead poisoning.

After recognizing the symptoms of lead poisoning, her doctor took a detailed history.

- Renovating a home that was built prior to 1978 can expose occupants to high lead levels from old paint, but Aryan and Shanaya’s apartment had been built in 2002.
- Some occupations such as construction, plumbing, and auto refinishing cause exposure to lead, but Aryan was an engineer and Shanaya was an accountant.
- Hobbies such as pottery, target shooting and working with stained glass involve lead, but Aryan and Shanaya mostly spent their free time hiking with their dog and watching movies on Netflix.
- Her doctor knew that 1 out of 5 ayurvedic medicines purchased over the internet contain heavy metals such as lead, mercury, and arsenic suggesting that the vasantha kusumakaram might be responsible.

Lead Shouldn’t Be In Your Body At All

Lead levels greater than 5 micrograms/deciliter (ugm/dl) are considered harmful. Shanaya’s level was 114 ugm/dl! Unfortunately, the lead in her body had become incorporated into her bones where it would be released over the next decade.

At Shanaya’s next visit she reported that she had missed a period and had a positive home pregnancy test result. She and Aryan had thought that they would never be able to have children and now they had gotten pregnant on their own!

Lead + Babies = Not Good. Now what?

Lead is not good for babies. During pregnancy, calcium is released from bones to help form the baby’s bones... bringing any lead along with it. Thankfully, prior to Shanaya’s surprise pregnancy, she underwent chelation treatment in order to get lead out of her bones more quickly. This is a process in which a medication is given that sticks to the lead and allows the body to excrete it. The chelation worked and her lead levels came down to 70 and then 22 ugm/dl over 6 months of treatment.

After discovering her pregnancy, a repeat lead level showed a slight climb in lead levels to 30 ugm/dl. While Shanaya and Aryan’s developing baby was at an increased risk for problems such as miscarriage, brain and kidney development issues, and the potential for learning and behavior issues and decreased IQ, chelation was not an option to reduce lead levels. It is potentially harmful in pregnancy and unless lead levels climb above 45 ugm/dl, it is not recommended.

Essential Supplements Are Musts

As her OBGYN, I saw Shanaya and Aryan at 7 weeks along in their pregnancy. We were all relieved to see a healthy fetus with a normal heart rate! I made recommendations to improve chances for a healthy baby, including taking in 2,000 mg of calcium through diet and supplements to provide the calcium that the baby’s bones would need. Green leafy vegetables, almonds and dairy products are excellent sources of calcium. Because of her anemia, we had her start to take iron twice a day. Vitamin D is also involved with bone development so this was the final supplement that we added. At 7 weeks into her pregnancy, her lead level was 17 ugm/dl and by the second part of pregnancy it was stable at 13 ugm/dl.

We performed an ultrasound scan at 20 weeks and their healthy daughter is developing perfectly with no signs of birth defects. While it appears that all will turn out well for this couple, they are already investigating ways to enrich their daughter's early years to make up for any possible small decrease in IQ as a result of the lead exposure.

Avoiding Lead Exposure

Lead is a metal that doesn't belong in any of us, but especially in pregnant women. Sadly, though, the only two states that require pregnant women to have lead levels checked are New York and Minnesota. Here's what you can do to avoid lead:

- Avoid natural or herbal supplements unless your doctor tells you that they are 100% safe.
- Don't be misled by advertisements that are designed to sell products that haven't been evaluated for safety and quality.
- Doctors should consider screening all women (not just those who are pregnant) exposed to lead through work or hobbies, who are recent immigrants, live in homes built before 1978, or who have cravings to eat non-food items (pica).

For more information, visit MotherToBaby's [Lead Fact Sheet](#), or contact a MotherToBaby expert via [phone](#), [text](#), [live chat](#), or [email](#). In addition, MotherToBaby has a whole section dedicated to lead exposure education including videos and brochures [here](#).

**The names and some of the details of this couple have been changed to protect their identity.*

About the Authors

Kurt Martinuzzi, MD, is an assistant professor and specialist in Obstetrics and Gynecology at Emory University in Atlanta, Georgia. His interests include resident and medical student education, recurrent pregnancy loss, premature ovarian failure and polycystic ovary syndrome. He has been an active member of the Region 4 Pediatric Environmental Health Specialty Unit since 2015. Over his 25 plus year career he has been awarded multiple teaching awards and presented at many national and regional Ob/Gyn meetings.

Claire D. Coles, PhD, is Professor of Psychiatry and Behavioral Sciences and Pediatrics at Emory University, Director of the Maternal Substance Abuse and Child Development Laboratory, and Director of MotherToBaby Georgia. Her expertise is in the developmental and behavioral effects of prenatal exposure to drugs and alcohol and the interaction of these effects with the postnatal environment. She was among the first to describe the behavioral effects of prenatal alcohol exposure and to investigate the effects of cocaine exposure on child development. Dr. Coles established the only multidisciplinary clinic in the Southeastern United States that provides specialized services to individuals prenatally exposed to drugs and alcohol. Her team also designed interventions for those affected, including the Math Interactive Learning Experience and the GoFAR intervention.

About MotherToBaby

MotherToBaby is a service of the Organization of Teratology Information Specialists (OTIS), suggested resources by many agencies including the Centers for Disease Control and Prevention (CDC). If you have questions about exposures, like lead, during pregnancy and breastfeeding, please call MotherToBaby toll-FREE at 866-626-6847 or try out MotherToBaby's new [text information service](#) by texting questions to (855) 999-3525. You can also visit [MotherToBaby.org](#) to browse a library of fact sheets about dozens of viruses, medications, vaccines, alcohol, diseases, or other exposures during pregnancy and breastfeeding or connect with all of our resources by downloading the new MotherToBaby free app, available on [Android](#) and [iOS](#) markets.

References

Saper RB, Russell SP, Sehgal AS et al. Lead, Mercury, and Arsenic in US- and Indian-manufactured Medicines Sold via the Internet. JAMA 2008; 300(8):915-923.

Guidelines for the identification and management of lead exposure in pregnant and lactating women. <https://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf>

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By Dr. Sarah Običan, OBGYN, MotherToBaby

It's noon. I just ran into my academic office to call back a few patients in between a packed schedule. I just spent my morning seeing 17 patients and gauging by my afternoon schedule, the day was not going to get much easier. I was new at my job as an OBGYN having joined the academic practice where I completed my residency. It was a busy practice, but I loved my job and I loved my patients. As I sat in my chair, I finally felt my feet again and realized they were hurting, but before I could kick off my heels, my cell phone rang. It was my IVF doctor.

By this time, my husband and I had been dealing with infertility for over a year and had decided to have tests done by one of my medical partners. She phoned to give me results of my testing.... As it turns out a hormone, called anti-mullerian, was low. It may have been in part a cause to our inability to conceive naturally. I could not muster a response to her. Instead - silence. A whole minute must have passed, after which all I said to my doctor was "I must be one of the 10%."

I was not alone.

According to a CDC survey from 2006 - 2010, more than ten percent of couples trying to conceive have infertility. It's a medical problem that impacts entire families, marriages and your work. The journey is long, time intensive, costly, emotionally heavy with so much joy and pain all wrapped up into a six week treatment cycle. It's not for the faint of heart.

Since the first IVF conceived child was born in 1978, things have changed. In fact, even in the 3 year period and 11 cycles I went through in my own life things have changed. We are learning so much about new technologies and improving outcomes. We're able to offer patients better risk assessments and counseling today.

Is IVF safe?

All things considered, assisted reproductive technologies (ART) are safe and the studies are proving it. Multiple studies have supported that IVF does not increase your risk of breast cancer or cancer overall. However, pregnancy conceived by ART are at increased risk of multiples, including monozygotic twins (when twins share the same placenta). These types of twins do carry increased risk of birth defects, preterm labor and delivery.

On average, women necessitating these medical interventions tend to be older and may have additional medical issues, all which impact the pregnancy.

For the baby, while we do know any risk of birth defects is low, some studies do show a small increased risk of overall birth defects, specifically heart defects, in IVF-conceived children, including a 2012 Australian study that looked at more than 6000 children conceived by using ART. It's hard to completely understand if the risk is due to the

interventions itself or due to any underlying issues the higher-risk patients being studied carry.

The formation of a baby's heart is an exceptionally complex biological process. Because of this, it's not surprising that, of all birth defects, heart defects tend to be most common. Similarly, the infertile population and those who undergo ART have an increased risk of having a baby with a heart defect, specifically defects affecting the ventricular and atrial septum, as well as a complex birth defect called Tetralogy of Fallot. All women with an ART conceived pregnancy should have a detailed ultrasound between 18-22 weeks to evaluate fetal anatomy and a fetal echocardiogram to evaluate for heart defects. Folic acid supplementation is also important.

Drawbacks to the studies

Despite 60,000 infants being born in the U.S. using ART, the vast majority of studies investigating the associated risk with ART have studied a population which conceived and delivered outside of the U.S. Other limitations of the early studies include looking at relatively small numbers of patients. As a doctor, I hope more studies will be conducted examining U.S. pregnancies involving ART since we have such a diverse population. Studying IVF among our differing ethnicities, age and socioeconomic backgrounds will help doctors make even better recommendations to the couples trying exhaustively to start their families.

For now, just breathe...

I did. Chin up, support system intact, I kept forging ahead. With each failed IVF attempt along the way, my heart may have broken a little, but, at least the absolute risk of heart defects in the potential pregnancy remained small. Three years of trying and my son finally arrived. My heart is now full.



Sarah G. Obican, MD, is an OBGYN, Maternal Fetal Medicine specialist at the University of South Florida. She currently serves on MotherToBaby's Board of Directors. She's also a councilmember of MotherToBaby's sister society, the Teratology Society.

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References:

<http://www.cdc.gov/nchs/fastats/infertility.htm>

Davies MJ, Moore VM, Willson KJ, Van Essen P, Priest K, Scott H, Haan EA, Chan A. Reproductive technologies and the risk of birth defects. *N Engl J Med.* 2012 May 10;366(19):1803-13.

Olson CK1, Keppler-Noreuil KM, Romitti PA, Budelier WT, Ryan G, Sparks AE, Van Voorhis BJ. In vitro fertilization is associated with an increase in major birth defects. *Fertil Steril.* 2005 Nov;84(5):1308-15.

Hansen M1, Kurinczuk JJ, Milne E, de Klerk N, Bower C. Assisted reproductive technology and birth defects: a systematic review and meta-analysis. *Hum Reprod Update.* 2013 Jul-Aug;19(4):330-53.

Kelley-Quon LI, Tseng CH, Janzen C, Shew SB. Congenital malformations associated with assisted reproductive technology: a California statewide analysis. *J Pediatr Surg.* 2013 Jun;48(6):1218-24.

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