

# General Anesthesia

## The safety of general anesthesia during pregnancy or breastfeeding

The information provided below is for readers based in the United States of America. Readers outside of the United States of America should seek the information from local sources.

### **THIS MEDICATION CAN CAUSE HARM TO YOUR BABY:**

General anesthesia may increase the risk of birth defects, miscarriage, stillbirth, or death of the baby after birth. It also may cause low birth weight or impaired brain development in babies. If possible, general anesthesia should be avoided during pregnancy, especially during the first and third trimesters, unless the benefits outweigh potential risks.

#### **General anesthesia description:**

General anesthesia is used during medical procedures to put you into a sleep-like state where you are completely unconscious and unable to feel any pain. Specialized doctors, called anesthesiologists, and certified registered nurse anesthetists are specially trained to provide general anesthesia. Anesthetics are given prior to surgery through an IV (intravenous) line that goes into a vein in your arm or hand. Types of IV drugs that might be used include propofol, etomidate, and ketamine. You may also be asked to breathe in gases through a mask. Sevoflurane is the most frequently used inhaled agent for bringing about anesthesia. General anesthesia is only given in a hospital or other medical facility under specialized supervision.

#### **What is general anesthesia used for?**

General anesthesia is given before major medical procedures to ensure that you stay completely still, feel no pain, and don't remember the procedure. It is given for procedures that: affect your breathing (surgery in the chest or upper part of the stomach), involve a major organ, take at least a few hours, involve a large portion of your body, expose you to a cold environment, or result in a large blood loss. For minor surgeries or procedures done on a small part of your body, you may only need local or regional anesthesia.

## How does general anesthesia work?

General anesthesia works by altering the activity of chemicals in your brain. It can cause certain areas of your brain to be inactive, making you unconscious. Under anesthesia, your brain will not respond to pain signals or reflexes.

## If I am having a procedure and need general anesthesia, can it harm my baby?

The FDA recently issued a warning in 2016 regarding the use of general anesthetics in pregnant women. Animal studies showed that exposure to a general anesthetic or sedative drug for over 3 hours could cause loss of nerve cells in the developing brain of the offspring, particularly during the third trimester of pregnancy. It was suggested that this could lead to long-term effects on learning or behavior. In the U.S., surgeries requiring general anesthesia for expecting moms in their third trimester of pregnancy are only performed when medically necessary and usually do not last longer than 3 hours. The FDA advises that in these cases, expecting moms should not avoid or delay surgeries or procedures because doing so could result in harm to themselves or the baby. For procedures lasting longer than 3 hours, the benefits of treatment must be weighed against potential risks to the baby.

Various medications are used during general anesthesia, some of which have been shown to result in possible harm to the baby. **The FDA advises that general anesthesia medications should only be used during pregnancy when medically necessary.** A few anesthetics, such as ketamine, are not recommended at all for use in pregnant women. Anesthetics, such as etomidate, ketamine, and propofol, should also be avoided during labor and delivery, including during Caesarean section. Other medications that are sometimes used in conjunction with general anesthetics, including lorazepam, midazolam, fentanyl, and pentobarbital, have warnings from the FDA that their use may cause harm to your baby. If you are having a procedure with general anesthesia, your doctor will determine which medications are safest.

In addition to the risks of having a procedure with general anesthesia during pregnancy, the National Institute for Occupational Safety and Health (NIOSH) warns that **working in an operating or recovery room with a person or animal that is anesthetized could increase your likelihood of having a miscarriage if anesthetic inhalants are not properly controlled.** Nurse anesthetists, anesthesiologists, veterinarians, dentists, surgeons, operating-room nurses, operating-room technicians, or recovery-room nurses may be at risk for exposure to anesthetics.

## Evidence:

One study found an increased risk of miscarriages seen in expecting moms who needed surgery with general anesthesia in the first or second trimester. Another study reported an increased rate of birth defects involving the eyes and a condition causing fluid buildup in the brain in babies whose moms had a procedure requiring anesthesia during the first trimester of pregnancy.

Two studies using data from Swedish health care registries followed 5,405 and 778 expecting moms who had an operation requiring anesthesia. In both of these studies, there was not an increased risk of birth defects or stillbirths (death in the womb) seen, but there was an increased number of babies born that were low birth weight. There was also a larger number of babies who were born alive but died within 7 days after birth.

A study analyzed a total of 104 expecting moms who had operations with anesthesia. There was no increased rate of birth defects seen. The study found that babies born to moms who had surgery during pregnancy had a lower birth weight.

A study looked at 77 expecting moms who had abdominal surgery that required general anesthesia. It was determined that surgery during the first and second trimesters did not increase the risk of preterm labor, birth defects, or death of the baby. However, surgery during the third trimester increased the risk of preterm labor. Another study found a higher risk of preterm labor in expecting moms who had a non-obstetric surgery (surgery that did not involve the female reproductive organs) in 78 expecting moms who had an operation.

**Bottom line: Procedures requiring general anesthesia may increase the risk of birth defects, low birth weight, miscarriage, stillbirth, or death after birth. If possible, procedures requiring general anesthesia should be delayed until after pregnancy, unless they are medically necessary.** The FDA has also issued a warning that surgical procedures that are longer than 3 hours, especially during the third trimester, have been shown to impair brain development in the offspring of animals. In these cases, the benefits of treatment must be weighed against potential risks. Your doctor will determine if your procedure can be delayed until after your pregnancy. If the procedure is necessary, your doctor will choose which drugs are safest to use during your procedure.

**If I become pregnant and have a procedure scheduled that requires general anesthesia, what should I do?**

If you become pregnant prior to an upcoming medical procedure, you should contact your doctor immediately. Your doctor may decide to reschedule your procedure until after your pregnancy.

## **If I am having a procedure that uses general anesthesia, can I continue to safely breastfeed my baby?**

The FDA recommends exercising caution with most medications used for general anesthesia if you are breastfeeding. Some anesthetics and medications used in conjunction with general anesthetics have been shown to pass into breast milk, including propofol, pentobarbital, midazolam, lorazepam, and fentanyl. There is very little evidence on the safety of breastfeeding after a procedure with general anesthesia. One expert panel recommends discontinuing breastfeeding for a certain amount of time after administering propofol to moms. Anesthesiologists often advise moms to discontinue breastfeeding temporarily after a procedure to avoid exposing their baby to any of the medications used during general anesthesia.

Some studies have determined that it may not be necessary to discontinue breastfeeding. Despite the fact that anesthetic drugs pass into breast milk, data has suggested that the amount of drug in breast milk is not significant and presents little to no risk to the breastfed baby. The medications used during general anesthesia pose a risk of harm to the baby, but because these drugs are only used for a short period of time during the procedure, risks to the baby are minimized. This study concluded that nursing moms could begin to breastfeed as soon as they are awake and comfortable, but babies should be monitored for possible side effects. Depending on the medications used for your anesthesia and the length of your procedure, your doctor will determine whether breastfeeding after your procedure is safe for your baby or if it should be temporarily discontinued.

In cases where breastfeeding should be discontinued after surgery, moms can pump their milk prior to the procedure and store it for their baby. Moms may also pump and dump breast milk after anesthesia, although there is no evidence to support this practice. Please speak to a lactation consultant about how to maintain your milk supply during this time if you do need to temporarily stop breastfeeding.

**Bottom line: Most medications used during general anesthesia will pass into breast milk and could potentially cause harmful effects in your baby if you are nursing.** Depending on the length of your procedure and the medications used during general anesthesia, your doctor will determine whether breastfeeding should be temporarily discontinued after the procedure or if you can resume breastfeeding.

**If I am having a procedure with general anesthesia or work in an environment where I am exposed to anesthetic gases, will it be more difficult to get pregnant?**

There have been no studies looking at the effects of general anesthesia on fertility in women, but one study found that male anesthesiologists did not have any abnormalities in sperm count. The study collected semen samples from 46 anesthesiologists who worked at least 1 year in hospital operating rooms that had modern ventilating devices to control and eliminate anesthetic gases. The study concluded that limited exposure to anesthesia did not affect sperm production. However, men who are working in an environment that does not have proper ventilation for anesthetics may be at risk for potential problems with sperm production and function.

If you work in an environment where you may be exposed to anesthetic gases, you should not try to become pregnant before first speaking with your doctor. Exposure to improperly controlled anesthetic inhalants may increase your risk of having a miscarriage.

### **If I am having a procedure with general anesthesia, what should I know?**

**Most medications used for general anesthesia are not recommended for use during pregnancy unless the benefits outweigh the risks.** Some of the medications are not recommended at all during pregnancy and have the potential to cause harm to your baby. General anesthesia may increase the risk of birth defects, miscarriage, stillbirth, or death of the baby after birth. It can also cause low birth weight in the baby. Procedures using general anesthesia should be avoided during pregnancy if possible, especially during the first and third trimesters of pregnancy. The FDA has warned that general anesthesia may increase the risk of impaired brain development, particularly when a procedure is performed during the third trimester of pregnancy and for procedures that are longer than 3 hours. Your doctor will determine if your procedure can be scheduled after your pregnancy. If you have to have general anesthesia for a procedure during pregnancy, your doctor will determine which anesthesia medications are safest for both you and your baby.

Most medications used for general anesthesia pass into breast milk and may cause harm to your baby. Some studies have concluded that the amount of drug that passes into breast milk is not significant. Anesthesiologists often recommend temporarily discontinuing breastfeeding after your procedure, but some studies have determined that breastfeeding can be resumed after the procedure. Your doctor will determine whether you should temporarily stop breastfeeding after general anesthesia, or whether you can continue nursing.

### **If I am taking any medication, what should I know?**

All pregnancies have some risk for having a miscarriage, a baby with a birth defect, or other poor birth outcomes regardless of medical conditions or drug exposures. There is no absolutely safe medication

for all pregnant women, but sometimes a medical condition can be more harmful than the drugs that are available to treat it. Always consult a health care professional about medications and other treatment options that you may need during your pregnancy to determine what is best for you and your baby.

You may find Pregistry's expert reports about the individual medications used during general anesthesia [here](#).

The information in this report is not intended as a substitute for the advice and care of your doctor or other health care provider. Always consult your doctor before you take or stop taking any medications during your pregnancy and while you breastfeed.

This report provides a summary of available information about the use of general anesthesia during pregnancy and breastfeeding. Content is from the product label unless otherwise indicated.

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## **General information**

It is very common for women to worry about having a miscarriage or giving birth to a child with a birth defect while they are pregnant. Many decisions that women make about their health during pregnancy are made with these concerns in mind.

For many women these concerns are very real. As many as 1 in 5 pregnancies end in a miscarriage, and 1 in 33 babies are born with a birth defect. These rates are considered the background population risk, which means they do not take into consideration anything about the health of the mom, the medications she is taking, or the family history of the mom or the baby's dad. A number of different things can increase these risks, including taking certain medications during pregnancy.

It is known that most medications, including over-the-counter medications, taken during pregnancy do get passed on to the baby. Fortunately, most medicines are not harmful to the baby and can be safely taken during pregnancy. But there are some that are known to be harmful to a baby's normal

development and growth, especially when they are taken during certain times of the pregnancy. Because of this, it is important to talk with your doctor or midwife about any medications you are taking, ideally before you even try to get pregnant.

If a doctor other than the one caring for your pregnancy recommends that you start a new medicine while you are pregnant, it is important that you let them know you are pregnant.

If you do need to take a new medication while pregnant, it is important to discuss the possible risks the medicine may pose on your pregnancy with your doctor or midwife. They can help you understand the benefits and the risks of taking the medicine.

Ultimately, the decision to start, stop, or change medications during pregnancy is up to you to make, along with input from your doctor or midwife. If you do take medications during pregnancy, be sure to keep track of all the medications you are taking.