

Patient information from the BMJ Group

Toxoplasmosis in pregnancy

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Toxoplasmosis in pregnancy

Toxoplasmosis is a common infection that's usually passed on by cats. Anyone can get toxoplasmosis, but if you're in generally good health, it probably won't make you ill. But it's worrying if you get toxoplasmosis when you're pregnant, because it can harm your baby.

We've brought together the best research about toxoplasmosis and weighed up the evidence about how to treat it. You can use our information to talk to your doctor and decide which treatments are best for you and your baby.

What is toxoplasmosis?

Toxoplasmosis is an infection that's usually passed on by cats. Most people who are infected don't know they have it or get only mild symptoms. But if you get toxoplasmosis when you're pregnant, it can cause serious health problems for your baby. Toxoplasmosis can also be a serious illness for anyone with a weak **immune system**.

Toxoplasmosis is caused by a tiny **parasite**. These parasites live inside the bodies of other living things. Some parasites can make you ill, a bit like **viruses** or **bacteria** can.



Toxoplasmosis is an infection that's usually passed on by cats.

The parasite that causes toxoplasmosis grows in the bowels of cats. It comes out in their faeces (stools), mainly into litter boxes and garden soil.

From the soil the parasite can spread to grass, water, and fruit and vegetables. Also, it can be picked up by other animals such as sheep, pigs, or deer. ^[1]

You can get toxoplasmosis if you: ^[1] ^[2]

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- Touch your mouth with your hands after gardening, cleaning a cat's litter box, or touching anything that has come into contact with cat faeces, without washing your hands first
- Eat undercooked meat from infected animals, especially pork, lamb, or venison
- Touch your mouth after handling raw contaminated meat without washing your hands first
- Use kitchen utensils or chopping boards that have been in contact with raw contaminated meat
- Eat unwashed fruit or vegetables from contaminated soil
- Drink contaminated water
- Receive an infected organ transplant or blood transfusion (although this is rare).

Once you've had toxoplasmosis, you are usually immune for life. This means you can't get it again.

Toxoplasmosis and pregnancy



If you're pregnant, it's really important to prevent toxoplasmosis.

Toxoplasmosis is usually harmless and goes away on its own.^[2] But if you pick up toxoplasmosis when you're pregnant, the infection can cause serious health problems for your unborn baby.^[3] That's because the baby's immune system hasn't developed enough to fight off the infection. So the infection can spread and cause serious problems.

If you've had toxoplasmosis in the past, before becoming pregnant, it's highly unlikely to affect your baby.^[1] ^[3] But if you have it during pregnancy, or in the three months before

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you conceive, the infection can pass to your baby through the **placenta** (the organ that passes food and oxygen to your unborn baby).^[4]

What's the risk of the infection being passed to my baby?

If you get toxoplasmosis for the first time during pregnancy, it doesn't always mean your baby will get infected. Some research has found that more than half of pregnant women infected with toxoplasmosis for the first time don't pass the infection to their babies.^[5]

The risk of passing on toxoplasmosis to your baby depends on at what point in your pregnancy you became infected. The risk is:

- Lowest if you get infected in early pregnancy
- Highest if you get infected in late pregnancy.

For example, the risk of your baby getting infected is just 2 in 100 if you get toxoplasmosis at eight weeks of pregnancy. But this risk rises to 80 in 100 if you get it shortly before giving birth.^[6]

Babies infected in early pregnancy are more likely to have serious health problems than those infected later. Also, in early pregnancy you may **miscarry** (lose your baby).

Researchers have worked out that the most dangerous time for you to catch toxoplasmosis is at 24 to 30 weeks of pregnancy, when there is a 10 in 100 chance of your baby being severely affected. Babies who have toxoplasmosis at this time are more likely to have health problems in later life.^[6]

How can I protect myself against toxoplasmosis in pregnancy?

If you're pregnant, it's **really important** to avoid getting toxoplasmosis.^[2]

- If you have a cat, avoid changing its litter if possible. Have another family member do it. Or if you have to do it yourself, use gloves and then wash your hands thoroughly.
- See that the litter box is changed daily. It takes the cat faeces several days to become infectious.
- Ideally keep your cat inside so it can't come into contact with the parasite that causes toxoplasmosis. Or have someone else look after it while you're pregnant. Don't feed it raw or undercooked meat.
- Don't handle or adopt stray cats.

You can also get toxoplasmosis from contaminated food or directly from contaminated soil. So it's important to:

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- Avoid eating raw or undercooked meat or poultry. Cook meat to safe temperatures, using a thermometer to make sure it is cooked all the way through
- Peel or wash fruit and vegetables before eating
- Wash your hands and all utensils, chopping boards, plates, dishes, and counters that have been in contact with raw meat, poultry, seafood, or unwashed fruit and vegetables
- Wear gloves when gardening and during contact with soil or sand. Afterwards, wash your hands thoroughly.

How are babies affected by toxoplasmosis?

A baby who gets toxoplasmosis in the womb is said to have **congenital toxoplasmosis**. Most babies with this infection seem normal at birth. But they can get health problems months or even years later. These include: ^[7]

- Eye infections
- Hearing problems
- Learning difficulties.

Babies who are badly affected by toxoplasmosis are at risk of:

- Blindness
- Deafness
- Seizures (fits)
- Brain damage.

Some badly affected babies are stillborn or die a few days after birth.

Babies born with toxoplasmosis are usually treated with antibiotics for about a year after they're born.

Other people at risk

Apart from pregnant women, toxoplasmosis can also be serious for people whose immune system has been weakened by:

- HIV or AIDS
- Cancer treatment

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- Drugs given after an organ transplant.

People with weak immune systems get a more severe form of the illness, which can be life-threatening. The illness can cause them to have symptoms such as:

- Seizures
- Confusion and other mental problems
- Being partly paralysed
- Speech difficulties.

They can also get serious problems in their eyes, lungs, and other organs.

If you are pregnant and you have a weakened immune system, you will need special care during your pregnancy.

How do I know if I have toxoplasmosis in pregnancy?

You may not know if you've picked up toxoplasmosis while you're pregnant. That's because it often doesn't cause any symptoms.

Most healthy children and adults, including pregnant women, don't have any symptoms if they've got toxoplasmosis. In fact, they don't even know they've got it. ^[4]

About 10 in 100 infected people get a mild flu-like illness that can last for a few weeks. They may get symptoms such as:

- A high temperature
- Swollen glands
- Headache
- Sore throat
- Muscle pain.

If you're pregnant and think there's a chance you may have become infected, you can have blood tests to find out for certain. For instance, you may want to be tested if you are concerned about flu-like symptoms you've had, or if you've eaten some meat that wasn't cooked properly.

If you're planning to get pregnant, you might also wish to have a blood test to see if you've already had toxoplasmosis. This would mean you're now immune to the disease.

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Talk to your doctor or nurse if you would like a blood test for toxoplasmosis.

Having a blood test for toxoplasmosis

Only a little blood is needed for the blood test. The blood test will look for **antibodies** to the **parasite** that causes toxoplasmosis.^{[1] [8]} Antibodies are cells created by your **immune system** to fight infection. So if you have antibodies to the parasite in your blood, it means you have, or have had, the **infection**.

You may need to have more than one blood test. The tests will show not just whether you have been infected but also how recent that infection was. It is important to know this because antibodies can remain in your blood for as long as 18 months after you were first infected. But infection that happened more than three months before pregnancy is unlikely to affect your baby.

The tests for toxoplasmosis are not completely reliable because they often give **false-positive** results. This means they show positive for toxoplasmosis when it is not present, or mistake an old infection for a current one.^[1] This is one reason why pregnant women are not routinely screened for toxoplasmosis in the UK.

If you're pregnant and you have **HIV** (the human immunodeficiency virus), your doctor will probably advise you to have the blood tests. That's because HIV, and some other conditions, weaken your immune system, and toxoplasmosis can cause serious health problems for you. Even if you've had toxoplasmosis in the past, HIV could weaken your body's defences and allow the infection to start up again.^[1]

If your doctor does diagnose toxoplasmosis, the next step is to find out whether the infection has passed to your baby.

How can I find out if my baby has toxoplasmosis?

Amniocentesis or cordocentesis

Your doctor can find out if your baby is infected by doing a test called **amniocentesis**. For this, they will take a sample of the amniotic fluid (the fluid that surrounds your baby in the womb) by inserting a needle into your abdomen. Or they can take a sample of the baby's blood from the umbilical cord. This is called **cordocentesis**. But cordocentesis isn't used much for toxoplasmosis any more, because amniocentesis is safer for the baby. Doctors will usually only use cordocentesis if amniocentesis doesn't give a clear result.

After amniocentesis, the fluid is then checked for signs of infection using a special test called a **polymerase chain reaction (PCR)** test.

These tests are usually reliable. But they are not entirely safe for your baby.^[9] Both carry a small risk of **miscarriage** (losing your baby), which varies depending on the hospital where you have the test.

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You'll need to discuss the pros and cons of these tests with your doctor. If you don't have a test, your baby can be checked for toxoplasmosis after birth. Your baby will have a blood test that looks for antibodies to the infection. ^[9]

Ultrasound

If the amniocentesis test suggests your baby has toxoplasmosis, your doctor will use ultrasound to look for signs of damage in your baby.

Unborn babies who have toxoplasmosis usually look normal on ultrasound scans. But sometimes they show signs of the infection, such as:

- Hardening of tissue inside the brain
- Abnormalities of the lower parts of the heart (the ventricles)
- An enlarged liver
- Fluid in their abdomen (tummy)
- A thickened placenta (the placenta is the organ in the womb that takes food and oxygen to the growing baby).

If your unborn baby is severely affected

If your doctor thinks your baby is severely affected by the infection, you may wish to consider an abortion (termination of your pregnancy). For example, you might consider this option if your baby seems to have been infected before the 16th week of pregnancy, when serious damage is most likely. ^[1] Or you might consider it if the ultrasound scan shows too much fluid in the brain, suggesting the baby has brain damage.

Understandably, if either you or your baby is found to have toxoplasmosis, you will feel very distressed. You may find it difficult to make decisions. But you can ask for counselling to make sure you have all the information you need and help you reach a decision about what to do.

After your baby is born

Most newborn babies with congenital toxoplasmosis don't have any obvious signs of infection. ^[1] But some things can indicate that a baby has been born with the infection: ^[4]

- Brain abnormalities, such as too much fluid in the brain (called hydrocephalus), or hardening of brain tissue
- Eye problems, such as inflamed or crossed eyes, or blindness
- Epilepsy

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- Tiny red spots in the skin (called petechiae)
- **Anaemia** (not enough oxygen in the blood).

A baby with toxoplasmosis may also be born early (prematurely) and may have a low birth weight.

How common is toxoplasmosis in pregnancy?

We don't know exactly how many pregnant women get toxoplasmosis. Rates of infection vary from country to country and from time to time.

What we do know is that toxoplasmosis in pregnancy isn't common.

In Europe, about 2 in 1,000 to 16 in 1,000 pregnant women get infected. According to one study, at least 3 in 100,000 babies in the UK are born with toxoplasmosis. ^[10]

Researchers think that between 800 in 1,000 and 900 in 1,000 pregnant women in the UK are at risk of getting toxoplasmosis because they haven't had it before. ^[11]

Once you've had the infection, you are immune for life. You won't get it again.

What treatments work for toxoplasmosis in pregnancy?

If you have toxoplasmosis in pregnancy, there are some treatments that may help prevent your baby getting infected. But there hasn't been enough research to show if these treatments really work. Also, they can have some serious side effects.

Key points about treating toxoplasmosis in pregnancy

- If you are diagnosed with toxoplasmosis while you're pregnant, you will probably be offered drug treatment to help protect your baby.
- If your doctor thinks the **infection** has passed to your unborn baby, you may be offered further treatment to help reduce the effects on the baby.
- But we can't say for sure that these treatments work. There hasn't been any good-quality research to show that giving drugs to a pregnant woman with toxoplasmosis will protect her baby.
- Some of these drugs may have serious side effects, so you will need to carefully weigh up the pros and cons of taking them.

There hasn't been much research on the treatments for toxoplasmosis in pregnancy. They all need further study before we can say for certain how well they work.

Treatment Group 1

Treatments for toxoplasmosis in pregnancy

Treatments that need further study

- [Drug treatment for toxoplasmosis in pregnancy](#)

What will happen to me and my baby?

If you're diagnosed with toxoplasmosis while you are pregnant, you'll probably be offered drug treatment to help protect your baby.

If your blood tests show that you've had a recent infection, your doctor will probably offer you a prescription medicine called spiramycin. This comes as tablets or capsules.

Toxoplasmosis isn't harmful to you. The aim of the medicine is to reduce the chance of passing the **infection** to your unborn baby.^[4]

You'll need to discuss the pros and cons of this treatment with your doctor. Spiramycin hasn't been found to cause birth defects, but there's no guarantee that it's completely safe for your baby.^[7] It passes into the breast milk, although it hasn't been shown to cause problems in nursing babies.

Treatment for an unborn baby with toxoplasmosis

If your doctor thinks that your baby already has toxoplasmosis, they will probably offer you treatment. This will be a combination of medicines that travel to your baby through your blood.

Newborn babies and toxoplasmosis

If you had toxoplasmosis just before or during your pregnancy, your baby will be checked carefully shortly after birth. The doctor will do blood tests to see if your baby is infected. Your baby will also need further tests and examinations during the first months of life.

You can still breastfeed if you have toxoplasmosis. Doctors think it's unlikely that the infection would spread to the baby from breastfeeding.^[12] The **parasite** that causes the infection has never been found in human breast milk.

About 10 in 100 newborn babies who get toxoplasmosis while in the womb (congenital toxoplasmosis) have a severe infection that is obvious at the time of birth. These babies often have:

- Eye infection
- Enlarged **liver** and **spleen**
- Jaundice (yellowing of the skin and eyes)

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- **Pneumonia** .

Sadly, some babies die within a few days of birth.^[7]

Up to 90 in 100 infected babies seem normal at birth. But some will develop health problems months or even years later. The problems include:^[1]

- Eye infections and blindness
- Hearing loss
- Learning disabilities
- **Epilepsy** .

A serious eye infection called **retinochoroiditis** is the most common health problem caused by congenital toxoplasmosis. This can permanently damage your child's eyesight. One 20-year study found that in about 100 babies born with congenital toxoplasmosis, about 25 eventually developed retinochoroiditis. All the babies had treatment for toxoplasmosis before and after birth, so the numbers might have been different without treatment.^[13]

If your baby has eye problems, he or she will need to be supervised by an eye specialist, called an **ophthalmologist** .^[14] This is because new eye infections and sight problems can continue to happen through their childhood, into the 20s, and even later.^[1]

Some research has shown that babies who are treated with drugs in their first year are less likely to get permanent damage from toxoplasmosis than those not treated at all, or those treated for shorter periods.^[15]

Treatments:

Drug treatment for toxoplasmosis in pregnancy

In this section

If blood tests show you've had toxoplasmosis just before or during your pregnancy, your doctor will probably offer you a prescription medicine called spiramycin. This treatment is designed to reduce the chances of you passing the infection to your unborn baby.^[4]

Spiramycin is an **antibiotic** , which means it kills **bacteria** . It also attacks **parasites** such as the one that causes toxoplasmosis. It comes as tablets or capsules.

In the UK, spiramycin is available on a 'named patient' basis. Your doctor can prescribe the drug, but you may not be able to get it from a pharmacy straight away. The pharmacist has to get it from the company that makes it.^[16]

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If your doctor thinks that your baby already has toxoplasmosis, you'll probably be offered treatment that travels to your baby in the womb, through your blood. You'll usually be given a combination of medicines. The aim is to prevent or reduce the serious health problems that can happen to your baby. These drugs are usually given by a doctor who specialises in infections in children.

The combination of medicines consists of: ^[4]

- Pyrimethamine. This is a drug that fights parasites, such as the one that causes toxoplasmosis. It comes as tablets and may have the brand name Daraprim on the label
- Sulfadiazine (sometimes spelled sulphadiazine). This is an antibiotic that also attacks the parasite that causes toxoplasmosis. It belongs to a group of drugs called sulfonamides (sometimes spelled sulphonamides). It comes as tablets.

You'll probably be prescribed these two drugs for the rest of your pregnancy. ^[17] Once your baby is born, it's possible that he or she will continue to be treated with pyrimethamine and sulfadiazine for the first year of life. ^[4]

Pyrimethamine interferes with your body's ability to absorb folic acid, a vitamin that is essential for a healthy pregnancy. So along with the pyrimethamine you will need to take a supplement called folinic acid, which works in a similar way to folic acid.

We can't say for sure whether giving any of these drugs, or a combination of them, to a pregnant woman with toxoplasmosis is better for her baby than no treatment. There haven't been any good-quality studies (called **randomised controlled trials**). ^[18] And the poorer-quality studies that have been done had different results.

Some research has found, for example, that these drugs help protect babies against infection. But other studies have found that drug treatment makes no difference to whether babies get the infection or not. ^[19] And some studies were not done well enough to give reliable results. ^[20]

Even so, many doctors agree that treatment will either reduce the risk of your baby getting toxoplasmosis or reduce its effects. ^[17] ^[21]

Do these drugs have side effects in pregnancy?

Spiramycin is generally considered safe to take in pregnancy. It hasn't been found to cause birth defects. But there's no guarantee that it's completely safe. ^[7]

Pyrimethamine doesn't seem to cause birth defects, but it can cause problems in your bone marrow and in your unborn baby's bone marrow. The chances of this happening are reduced if you take a folinic acid supplement at the same time. ^[22]

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Sulfadiazine, like other sulfonamides, can sometimes cause health problems for mothers and babies.^[23] It can cause problems in your and your unborn baby's bone marrow. But the risk of this is reduced if you take a folic acid supplement at the same time.^[22] There's some research showing that sulfonamides can lead to a type of brain damage called **kernicterus** in newborn babies. These drugs should be avoided, if possible, in the last three months of pregnancy, or at least in the last few weeks.^[22]

Some other drugs are also being used or tested for treatment of toxoplasmosis in people with immune problems. But these haven't been studied in pregnancy, because their safety for babies is not known.

Further informations:

Glossary:

immune system

Your immune system is made up of the parts of your body that fight infection. When bacteria or viruses get into your body, it's your immune system that kills them. Antibodies and white blood cells are part of your immune system. They travel in your blood and attack bacteria, viruses and other things that could damage your body.

parasite

Parasites are germs or creatures that can only survive by living on or in another living thing.

viruses

Viruses are microbes (tiny organisms) that need the cells of humans or other animals to exist. They use the machinery of cells to reproduce. Then they spread to other cells in the body.

bacteria

Bacteria are tiny organisms. There are lots of different types. Some are harmful and can cause disease. But some bacteria live in your body without causing any harm.

transfusion

A transfusion is the replacement of blood that may have been lost during a long operation or in an accident. Before a transfusion, your doctor will make sure that the new blood matches your own. It is also possible, if you are planning surgery, to store some of your blood in advance, so that it can be given back to you during the operation. This is called an autologous transfusion.

placenta

The placenta is an organ that grows in the womb during pregnancy. It joins the woman to the growing baby. The placenta provides the baby with oxygen, water and nutrients from the mother's blood. It also produces the hormones that are involved in pregnancy.

miscarriage

A miscarriage is when something happens before the 28th week of pregnancy that means the fetus does not survive.

seizure

A seizure (or fit) is when there is too much electrical activity in your brain, which results in muscle twitching and other symptoms.

antibiotics

These medicines are used to help your immune system fight infection. There are a number of different types of antibiotics that work in different ways to get rid of bacteria, parasites, and other infectious agents. Antibiotics do not work against viruses.

HIV

HIV stands for human immunodeficiency virus. It's the virus that causes AIDS. It makes you ill by damaging cells called CD4 cells. Your body needs these cells to fight infections. You can get HIV by sharing needles for injecting drugs, or by having sex without a condom with someone who has the virus.

AIDS

AIDS stands for acquired immunodeficiency syndrome. People who are infected with the human immunodeficiency virus (HIV) get AIDS when the virus has destroyed most of their immune system. When people have AIDS, their body isn't able to fight infections. So even common infections, such as colds, can cause serious problems.

antibodies

Toxoplasmosis in pregnancy

Antibodies are an important part of your immune system. They are proteins made by white blood cells (another part of your immune system). They help destroy bacteria and other agents that cause infections.

infection

You get an infection when bacteria, a fungus, or a virus get into a part of your body where it shouldn't be. For example, an infection in your nose and airways causes the common cold. An infection in your skin can cause rashes such as athlete's foot. The organisms that cause infections are so tiny that you can't see them without a microscope.

ultrasound

Ultrasound is a tool doctors use to create images of the inside of your body. An ultrasound machine sends out high-frequency sound waves, which are directed at an area of your body. The waves reflect off parts of your body to create a picture. Ultrasound is often used to see a developing baby inside a woman's womb.

liver

Your liver is on the right side of your body, just below your ribcage. Your liver does several things in your body, including processing and storing nutrients from food, and breaking down chemicals, such as alcohol.

Epilepsy

Epilepsy is a condition that affects your brain. If you have epilepsy, the normal electrical activity in your brain gets disturbed from time to time. This leads to seizures (also called fits).

anaemia

Anaemia is when you have too few red blood cells. Anaemia can make you get tired and breathless easily. It can also make you look pale. Anaemia can be caused by a number of different things, including problems with your diet, blood loss and some diseases.

spleen

Your spleen is an organ that sits on the left side of your body just below your ribs. It helps your body fight infections.

pneumonia

Pneumonia is an infection in your lungs. Anything that causes infections (bacteria, viruses or fungi, for example) can give you pneumonia.

ophthalmologist

An ophthalmologist is a doctor who specialises in treating people's eyes.

randomised controlled trials

Randomised controlled trials are medical studies designed to test whether a treatment works. Patients are split into groups. One group is given the treatment being tested (for example, an antidepressant drug) while another group (called the comparison or control group) is given an alternative treatment. This could be a different type of drug or a dummy treatment (a placebo). Researchers then compare the effects of the different treatments.

bone marrow

Your bone marrow is the soft material inside your bones. Bone marrow makes and stores blood cells.

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