

Toxoplasmosis

and pregnancy



About Tommy's, the baby charity

Tommy's was set up in 1992 to make pregnancy and childbirth safer for both the expectant mother and her child by funding a national programme of medical research into miscarriage, stillbirth and premature birth.

Since the charity was founded in 1992, we have set up centres for maternal and fetal health research in London and Manchester, and funded more than 57 research projects in hospitals and universities across the UK.

Tommy's aims to see the number of baby deaths halved by 2030 but we cannot achieve this aim without increasing our support for the doctors and scientists who are discovering how to protect mothers and babies at risk.

Every parent-to-be hopes that their baby will be born healthy but every year in the UK one in four women and their partners will experience the trauma of miscarriage and around 4,000 babies will be stillborn. More than 100 babies are born too small or too soon every day and two per cent are severely premature, arriving six weeks before their expected birthday. Prematurity is the most common cause of baby death and one in 10 premature babies will develop a permanent disability.

As the UK's leading baby charity we want to find the answers for parents who deserve to know why their baby died or had to fight for life after being born prematurely.

Tommy's is determined to find out the causes of miscarriage, stillbirth and premature birth and to save tiny lives by discovering new ways to encourage healthy pregnancy and prevent problems. We support a nationwide programme of vital research and are already improving the chances of survival of hundreds of babies through our clinical trials. We are examining the processes underlying normal and premature labour, and finding ways to identify women who are most at risk of giving birth prematurely. We are increasing understanding of conditions such as pre-eclampsia which endanger both mother and baby and are making progress in discovering ways to prevent health problems in premature and low birth-weight babies.

Tommy's also provides information about pregnancy health issues for health professionals, parents and parents-to-be. We aim to ensure that information on health in pregnancy and reducing the risks of problems is available to all parents-to-be in the UK, thereby reducing the number of babies' lives lost.

What is toxoplasmosis?

Toxoplasmosis is an infection caused by the parasite *Toxoplasma gondii*, a microscopic single cell organism that can be found in meat, cat faeces, the soil where cats defecate, and unpasteurised goats milk. The parasite can infect most birds and warm-blooded animals, including humans. Toxoplasmosis is caught from eating anything infected with or contaminated by the parasite.

How is it caught?

It is caught from eating anything infected with the parasite. This could be:

- raw or undercooked meat, including raw cured meat e.g. Parma ham, salami
- unwashed, uncooked vegetables and fruit
- cat faeces and soil contaminated with cat faeces
- unpasteurised goats milk and dairy products made from it

Humans may become infected by five routes:

- eating the organism in soil or water contaminated with cat faeces
- ingestion of the organism in raw or undercooked meat or in milk from infected intermediate hosts (e.g. cows, sheep or goats)
- incorporation of the organism from transplanted organs or blood products from other humans with acute or latent toxoplasmosis
- transmission across the placenta 4–8 weeks after the onset of maternal infection
- infection by inhalation of sporulated oocysts is possible (but unusual)

There is no person-to-person transmission, except from mother to unborn child.

Infection is followed by the presence of the parasite in the blood and the invasion of organs and tissue. Host immune responses lead to the formation of tissue cysts which contain viable organisms. The incubation period is 5–23 days.

Who is at risk?

Anyone who eats anything infected with the organism is at risk of catching the infection. Some women may be at increased risk due to the job they do such as catering, working on the land or farming. Lambing is a particular risk for pregnant women



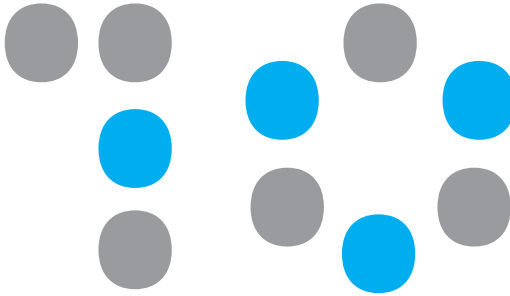
What are the effects of toxoplasmosis in humans?

Toxoplasmosis can be dangerous to humans if their immune system is underdeveloped or compromised, as in the case of an unborn child, a person with HIV, or a person on immuno-suppressant drugs. In these cases the immune system is unable to restrict the spread of the parasite, which can then cause damage. In healthy adults and children, the infection may cause mild 'flu-like symptoms or no symptoms at all. Occasionally a person may suffer from a prolonged and debilitating glandular fever-type illness.

Once a person has had the disease they are generally thought to be protected for life, unless they suffer an impairment of their immune system. Toxoplasmosis is therefore only a risk to an unborn baby if caught for the first time during pregnancy or within 2–3 months of conception.

Occasionally in the healthy adult or child, toxoplasmosis causes a prolonged and debilitating illness similar to glandular fever or ME. This condition is called acute acquired toxoplasmosis, which occurs when the infection is caught after birth. Diagnosis is by blood test, and the condition is sometimes treated with antibiotics. It is thought that in about 1% of these cases some damage to the eyes will occur. Somebody infected with toxoplasmosis before birth has congenital toxoplasmosis. The degree of risk to the fetus and the damage caused depends on when in pregnancy the mother acquired the infection.





What are the effects of toxoplasmosis in humans during pregnancy?

If a woman catches toxoplasmosis for the first time during pregnancy, it does not mean that the child will definitely be infected. Only 4 in 10 infections will pass to the unborn baby.

Toxoplasmosis may cause damage to the unborn baby if caught by the mother in the early stages of pregnancy. A baby may be:

- miscarried
- stillborn
- born with damage to the brain and other organs, particularly the eyes

However, most babies born with toxoplasmosis have no obvious damage at birth but develop symptoms, usually eye damage, during childhood or even adulthood. A few will have more serious symptoms such as blindness and brain damage.

How would I know if I have got it?

Toxoplasmosis does not usually cause any problems and in most cases a person does not realise they have ever had it. It can cause mild 'flu-like symptoms or in severe cases an unpleasant illness similar to glandular fever.

- up to half the population of the UK will have the infection by the age of 60 years
- it is generally accepted that once you have had toxoplasmosis, you are immune for life
- a blood test can detect toxoplasmosis



What does the blood test for toxoplasmosis involve?

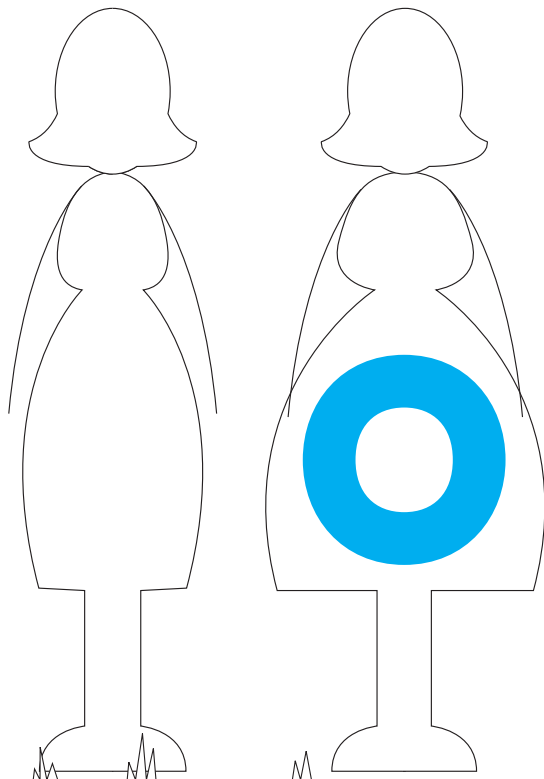
The toxoplasmosis blood test involves taking blood from the mother, leaving the baby unaffected. The blood tests look for antibodies to toxoplasmosis. Antibodies are produced by the body to fight infection.

Depending on what type of antibodies are found, and whether levels are rising, falling or stable, an estimate of the time of onset of infection will be made. Your local laboratory may refer your blood to a Toxoplasma Reference Laboratory to carry out these tests.

Who might have a blood test for toxoplasmosis?

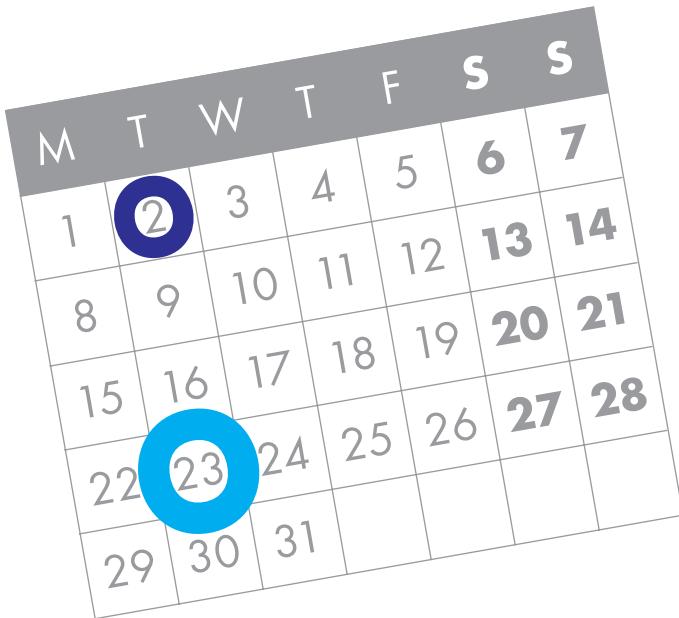
You might consider having a blood test for toxoplasmosis if, for example

- you think you might have put yourself at risk of catching toxoplasmosis
- if you are concerned about symptoms (which can sometimes be a bit like 'flu')
- if you would like to know if you are immune to toxoplasmosis or not before you get pregnant



When should someone have a blood test for toxoplasmosis?

Blood tests for toxoplasmosis can be done at any stage before or during pregnancy. The blood test can only show possible infection 3 weeks after any possible risk incident as it can take this long for antibodies to be detectable. This means that it may be necessary to wait for 3 weeks after a possible risk before having a blood test.



The blood test procedure

The blood test involves taking a small amount of blood from the mother, therefore this does not put the unborn baby at risk.

The blood test aims to show whether antibodies for toxoplasmosis are present or not, and if they are present to tell if they are to a current or a previous infection.

There are 3 possible outcomes to the blood test:

1. Not immune

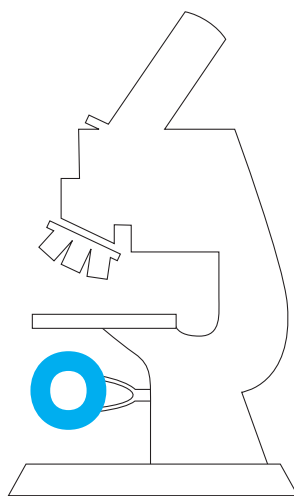
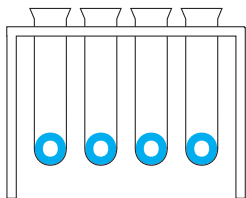
No antibodies are present so the blood is negative and shows that no exposure to toxoplasmosis has been experienced. This means that the person is not immune, so may need to take precautions to avoid infection both before conception and throughout pregnancy.

2. Immune

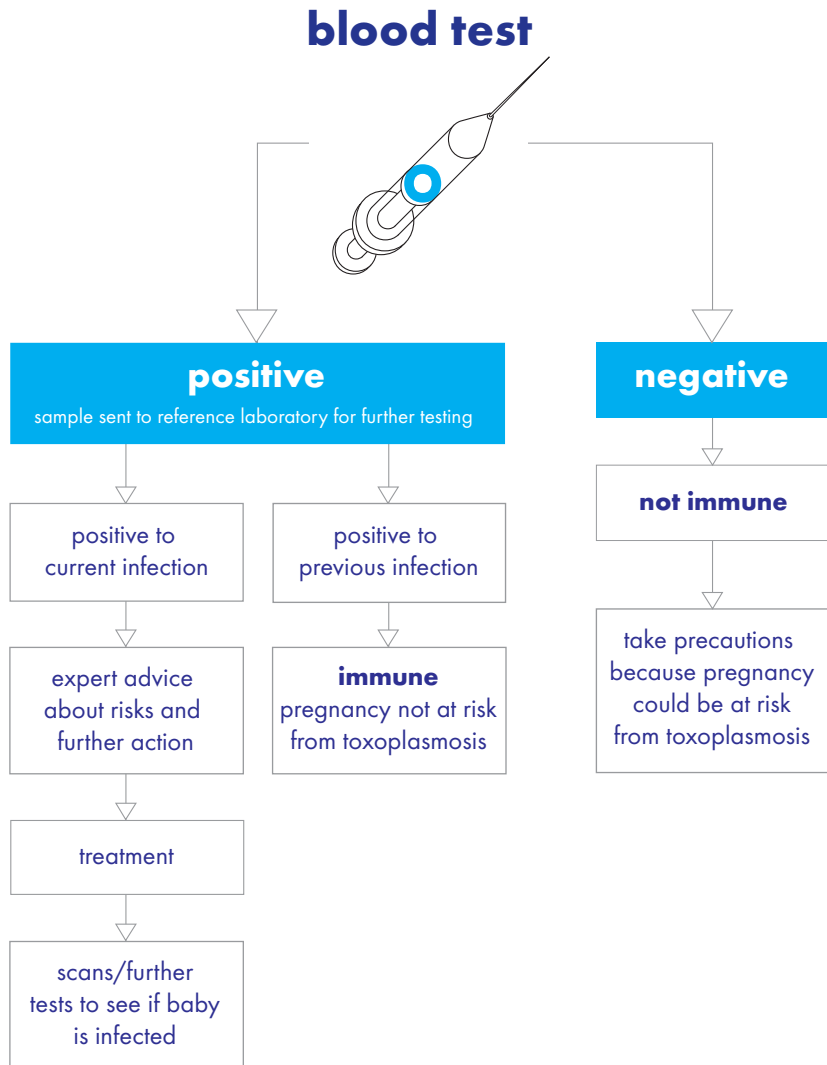
Antibodies are present in the blood, so the blood test is positive. With further testing it can be shown that they have experienced a toxoplasmosis infection previously. It is generally accepted that once you have had toxoplasmosis you are immune and protected for all future pregnancies unless your immune system is damaged (i.e. by HIV infection).

3. Positive due to a current infection

This means that the person is currently suffering from an acute toxoplasma infection and further action needs to be taken to assess the risk of passing the infection on to their unborn child.



Blood test procedure flow chart



How long does it take to receive the blood test results?

It may take only one week to get the blood test results, but if the sample has been sent from a local hospital laboratory to a reference laboratory then they will take longer. If the blood test results take an unacceptably long time to be returned, then the GP or obstetrician may ring the laboratory to get the results. It may be the relaying of the result back to the local hospital which causes the delay.

How do I know what the test results mean?

If there is any uncertainty about what the blood test results mean, an obstetrician or GP can contact the laboratory who did the test for clarification. Recommendations can be made about any further appropriate action e.g. treatment with antibiotics, or further testing.

What does a negative test result mean?

A negative result means that the patient has never had toxoplasmosis, is not immune, and needs to take precautions to avoid infection before conceiving and throughout pregnancy.

What does a positive test result mean?

A positive result means that the patient has had toxoplasmosis at some time in your life. Up to one in three pregnant women will have a positive result because they have had toxoplasmosis in the past. The tests are very sensitive so a small percentage of initial tests will appear positive when they are not. If the test is positive, the blood must be sent on from the local laboratory to a Toxoplasma Reference Laboratory, so make sure that this has happened.

How can they tell if the infection is current or in the past?

Further tests will be carried out to estimate when the infection was caught and whether there is any risk to the baby from toxoplasmosis. These tests look at the types of antibodies that are present in the blood sample and at what levels these are, and from this they can tell whether the infection is past or current. The Toxoplasma Reference Laboratory will pass the results to the woman's carers, who will pass the result on to the patient.



It is important for a woman who has been told that she has a positive result to know that this does not necessarily mean that the baby is at risk. If the infection is in the past, then she should be immune and the baby protected.

What if it is a current/recent infection?

If the tests show that the infection is current or recent, there is a risk that the baby will be infected. It is thought that it takes around 4–6 weeks for the infection to pass from mother to baby. The degree of risk and severity of damage depends on when the woman caught toxoplasmosis.

i) Shortly before conception (within 2–3 months)

Infection shortly before conception carries a 1% or below risk of transmission to the fetus, but high risk of miscarriage if the fetus does become infected.

ii) The first trimester

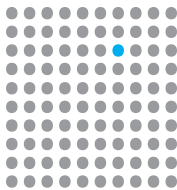
Risk of fetal infection is about 15%. A fetus infected at this stage has a high risk of being miscarried or born with severe symptoms such as hydrocephalus, calcifications of the brain, or retinochoroiditis.

iii) The second trimester

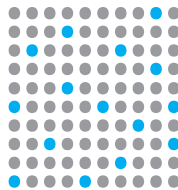
Risk of fetal infection is about 25%. A fetus infected at this stage is less likely to be miscarried but is still at risk of developing severe symptoms as above.

iv) The third trimester

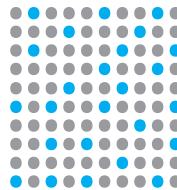
Risk of fetal infection rises again, and may be as high as 65%. Most babies infected will be apparently healthy at birth, but a large proportion will develop symptoms later in life, usually eye damage.



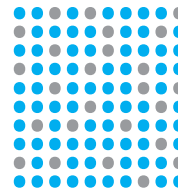
i) 1% Risk



ii) 15% Risk



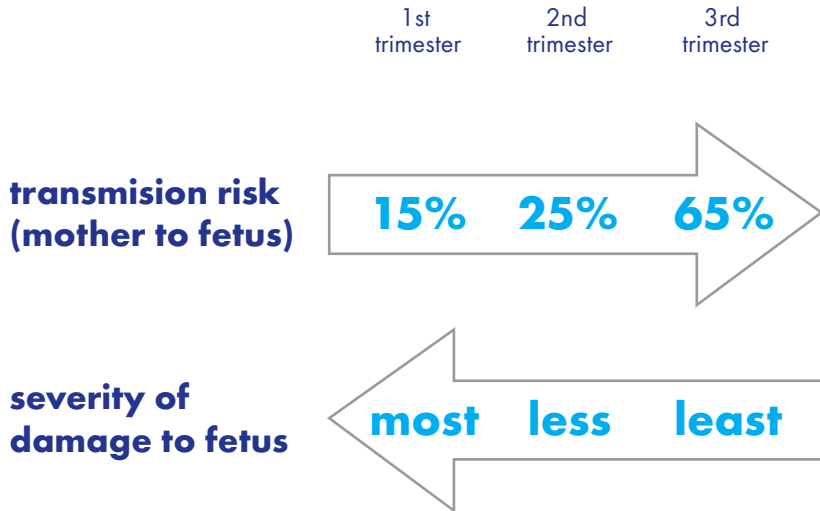
iii) 25% Risk



iv) 65% Risk



Timing of infection



Toxoplasma infection in pregnancy and fetal damage

Is it possible to find out if the baby is infected?

Further tests can be carried out to find out whether or not the baby is infected, although the tests will not show how severe the damage is.

Amniocentesis is a technique where amniotic fluid is removed by a fine needle from the amniotic sac. The procedure carries a 0.5–1% risk of causing miscarriage. It is normally carried out after 15 weeks of pregnancy. The amniotic fluid is then tested for various possible problems which could include specific tests for toxoplasmosis. Amniocentesis would only be carried out for toxoplasmosis if a recent or current infection in pregnancy had been diagnosed by previous blood test on the mother.

Cordocentesis is a technique to remove a sample of the baby's blood from the umbilical cord. The test has a 1–2% risk of miscarriage. The blood would then be tested for evidence of toxoplasmosis. Cordocentesis is rarely used as amniocentesis is preferred.

The blood or amniotic fluid will be tested at a Toxoplasma Reference Laboratory using a range of specialised tests which may include:

- A test to look for the parasite's DNA. If this is positive then the baby will be considered to be infected.

Timescale: results may take 1–3 days

- Using the blood or amniotic fluid sample to grow the parasite, which is called a culture.

Timescale: results will take several weeks

- Tests looking for antibodies to toxoplasmosis.

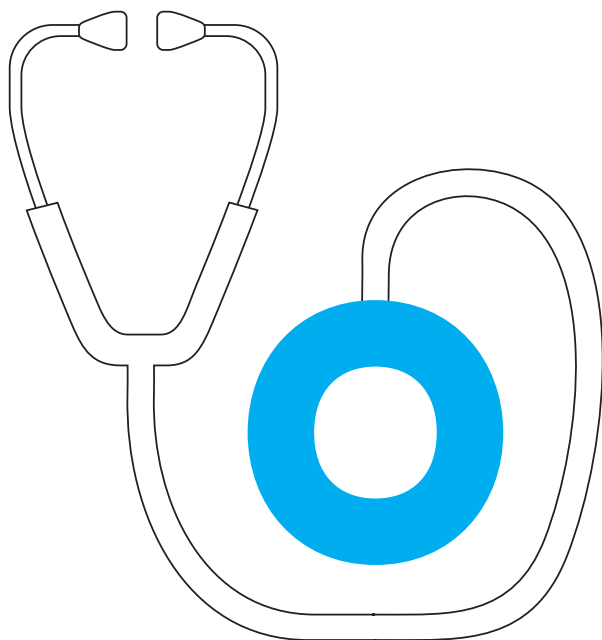
Timescale: results may take 1–3 days

A detailed ultrasound scan will show if there is major damage (such as hydrocephalus), but a scan which shows no damage, whilst reassuring, does not rule out the possibility that the baby is both infected and affected.



Where can these tests be carried out?

Most District General Hospitals will be able to carry out an amniocentesis, but cordocentesis is only done at more specialised centres, usually where there is a Centre of Fetal Medicine. If you are in any doubt about this, discuss with your consultant where such a test is done regularly, as the risk of miscarriage following such an invasive test may be lower in a specialist centre. A scan looking for problems with the baby will usually be done by a consultant obstetrician or a scan operator at a centre for fetal medicine.



What about follow-up tests after the baby is born?

All babies born to women who have had a recent or current infection in pregnancy should be given a thorough examination after birth and followed up with blood tests during the first year of life.

Options for treatment

An antibiotic, spiramycin, reduces the risk of the infection being passed from the mother to the baby and is normally used to treat toxoplasmosis in pregnancy. Spiramycin is available in the UK on a named patient basis, which means that any doctor can prescribe the drug, but it will not be readily available at the hospital dispensary or local chemist shop. Your pharmacist may get it from the manufacturers, or more likely the distribution company.

Spiramycin is not active against the parasite, so cannot limit any damage if a baby has already become infected.

If the baby is found to be infected, a combination of pyrimethamine and sulphadiazine can be taken. These are both stronger antibiotics and help limit any damage to the baby, although they cannot undo any damage.

Side effects of treatments

Spiramycin is used routinely in France for treatment of toxoplasmosis in pregnancy with little evidence of adverse effects. Experts consider that it is safe to use in pregnancy when a baby is at risk. Women taking spiramycin sometimes have side effects such as nausea or a rash.

Pyrimethamine and sulphadiazine can have side effects on the mother and baby and although not normally prescribed in pregnancy, they can be used in extreme circumstances. They are taken with folic acid to reduce the worst side effects.



Testing a baby after birth

When should a baby be tested?

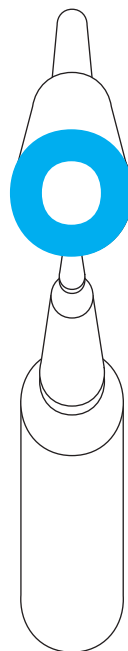
A blood sample should be taken from the baby shortly after birth. Sometimes this is taken from the umbilical cord, and although this method involves no pain for the baby, it may not give a good sample as it could be contaminated with the mother's blood. To get more accurate results, even though nobody likes to cause distress to a baby, it is best if the blood is taken from the baby either by heel prick or from a vein. A blood sample should also be taken from the mother to compare levels of specific antibodies between mother and baby.

What are they looking for?

Tests will be carried out to look for different types of antibodies to toxoplasmosis in the baby's blood. The baby will have some of the mother's antibodies, so a positive result is expected and not necessarily alarming. If additional antibodies are present this may indicate that the baby is infected, except in cases of placental trauma.

What checks/examinations should be carried out?

A baby who is known to be at risk of having congenital toxoplasmosis should be checked for signs of neurological damage including head circumference. The eyes will be looked at for any problem, preferably by an ophthalmologist who will put drops in to the eye to enlarge the pupils to get a better view of the back of the eye. The general health of the baby will also be checked. If there is a possibility that the baby had brain damage, special head X-rays might be carried out to check for calcifications, enlarged ventricles or any other abnormalities. Long-term follow-up by an ophthalmologist may be necessary if eye damage is confirmed.



Might further tests/examinations be needed?

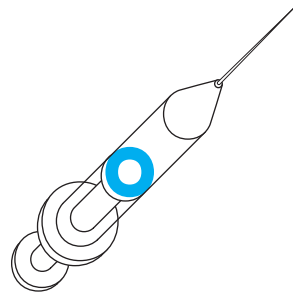
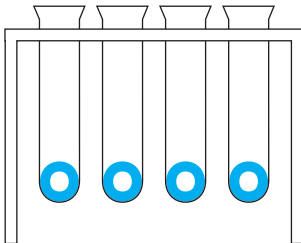
A blood sample every two months, up to the age of one year, can show whether the baby's antibody level is falling. The level should be completely negative by the time the baby is about one year old. This means that the baby has lost the antibodies acquired from the mother and is not congenitally infected. When the baby's blood sample is completely antibody-negative then the baby is definitely not congenitally infected. A falling antibody level is a good sign, but is not conclusive and tests should continue until the antibody level is completely negative.

What happens if a baby is infected?

If the blood tests show that the baby is infected, antibiotics can be given even if he/she shows no symptoms. Treatment can sometimes be continued for as long as one year, and helps to prevent or limit the eye damage that can occur later.

Can breastfeeding affect whether a baby becomes infected?

Toxoplasma organism has never been found in human milk, so there is no risk of passing on this infection through breastfeeding. If you do decide to breastfeed, your baby will have the advantage of getting extra antibodies from your milk, which would be especially helpful if he/she were infected.



How to reduce the risk of toxoplasmosis infection

The following precautions help to reduce the risk of catching toxoplasmosis

- Only eat meat which has been thoroughly cooked (i.e. with no trace of blood or pinkness)
- Avoid raw cured meat, such as Parma ham
- Wash hands, chopping boards, and utensils thoroughly after preparing raw meat
- Wash all fruit and vegetables thoroughly
- Don't drink unpasteurised goats milk or eat dairy products made from it
- Wear gloves when gardening and wash hands and gloves afterwards
- Take care with hygiene when handling dirty cat litter. Wear rubber gloves and wash hands and gloves afterwards. If possible, get someone else to do the job of clearing out the litter.
- Cover children's outdoor sandboxes to prevent cats from using them as litter boxes
- If your cat is in poor health (e.g. has feline AIDS) consult your vet

Where are the Toxoplasma Reference Laboratories?

1. The National PHLS Toxoplasma Reference Unit

Singleton Hospital, Sgeti, Swansea SA2 8QA

2. The Scottish Toxoplasma Reference Laboratory

Highland Acute Hospitals NHS Trust, Raigmore Hospital,
Old Perth Road, Inverness IV3 3UJ

For more information contact:

Tommy's, the baby charity

1 Kennington Road, London SE1 7RR

Tel: 020 7620 0188, Fax: 020 7928 6628

Website: www.tommys.org, E-mail: mailbox@tommys.org

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Make a Gift today, and help Tommy's, the baby charity, save tiny lives.

Our aim is to prevent the loss of babies' lives through miscarriage, stillbirth and premature birth. As well as providing information to parents-to-be, we also fund a nationwide programme of medical research to discover what causes problems in pregnancy and find out how to prevent them.

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If you do not wish your details to be passed on to other organisations carefully selected by Tommy's, please tick this box.

Further information & publications

Tommy's, the baby charity, publishes information for parents-to-be and for those who have experienced miscarriage, stillbirth or premature birth, as well as providing information on toxoplasmosis. Please indicate below if you would like to be sent further information.

Toxoplasmosis in pregnancy: everything you need to know

General information about toxoplasmosis

Toxoplasmosis and animals

A leaflet for pet owners and farmers about the risks of toxoplasmosis

Toxoplasmosis and pregnancy

Information for parents-to-be who are worried about toxoplasmosis

Healthy Pregnancy leaflet

Ten top tips on getting the best chance of a healthy pregnancy

Healthy Eating leaflet

A guide for mums-to-be on what to eat and what to avoid

Information on miscarriage

Information on stillbirth

Information on premature birth

Annual review

Details about the charity, its fundraising, research and information programme

Research update

An outline of our current research projects

Information on ways to donate regularly to Tommy's

Fundraising information

If you have an idea for a fundraising event/sponsored activity and would like to discuss this with a member of the Community Fundraising team

If you would like to know more about Tommy's annual events for young children.

Please ensure that you have completed your address details on the form opposite.

Re-ordering

To order further copies of Tommy's leaflets, please use the form below and return it to Tommy's, the baby charity, 1 Kennington Road, London SE1 7RR, or contact Tommy's directly on 020 7620 0188, e-mail: info@tommys.org

Toxoplasmosis and pregnancy: everything you need to know

Toxoplasmosis and animals

Toxoplasmosis and pregnancy

You can order up to 10 copies free of charge

But orders exceeding this carry a postage, packing and admin charge. Please send cheques made payable to TOMMY'S THE BABY CHARITY with your order.

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