

# How we can help you

Tommy's, the baby charity, publishes information for parents-to-be and for those who have experienced problems in pregnancy, such as 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 and pregnancy
- Toxoplasmosis and pregnancy: everything you need to know
- Toxoplasmosis and animals
- Toxoplasmosis: information about congenital toxoplasmosis
- Toxoplasmosis: information about symptomatic acquired toxoplasmosis
- Healthy pregnancy: a guide for parents-to-be
- When a baby dies: information for parents, for family and for friends
- Premature labour: information for parents
- Premature labour: information for midwives
- Information sheet on miscarriage
- Information sheet on stillbirth
- Information sheet on premature birth
- Information sheet on pre-eclampsia
- Information on ways to donate regularly to Tommy's
- Research update

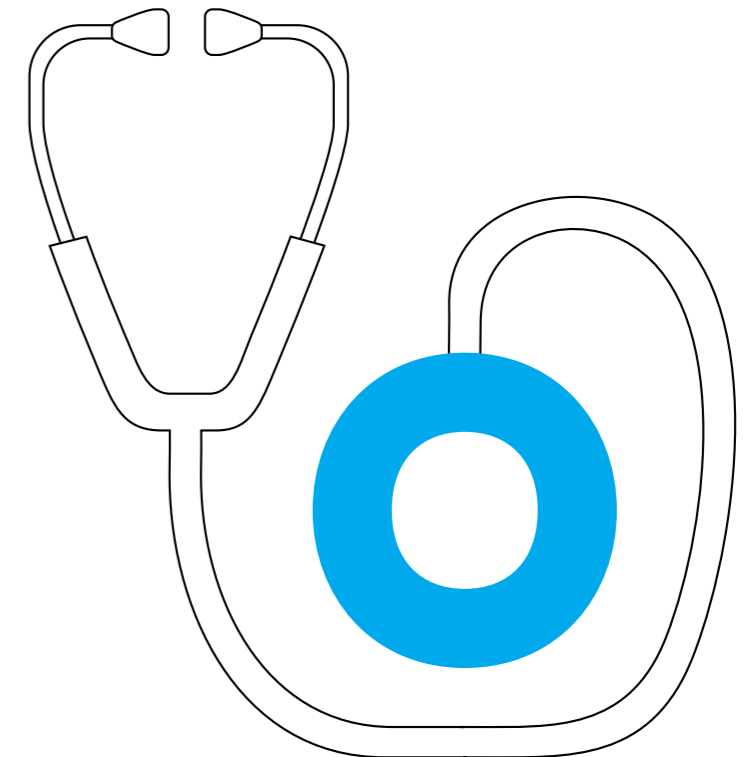
Please complete your details below and return the form to Tommy's, the baby charity, Nicholas House, 3 Laurence Pountney Hill, London EC4R 0BB, or contact Tommy's on our pregnancy information line (0870 777 30 60) or e-mail: [info@tommys.org](mailto:info@tommys.org)

<b>Your details</b>	Name
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# Toxoplasmosis

a hand book  
for health professionals



## Tommy's, the baby charity

Nicholas House  
3 Laurence Pountney Hill  
London EC4R 0BB  
Tel: 08707 70 70 70  
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**Pregnancy information line: 0870 777 30 60**

E-mail: [info@tommys.org](mailto:info@tommys.org)  
Website: [www.tommys.org](http://www.tommys.org)

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# About Tommy's, the baby charity

**Tommy's, the baby charity, aims to inform and educate all parents-to-be about health in pregnancy. By providing this information we hope to ensure that every pregnancy has the best possible chance of a healthy outcome and a healthy baby.**

Tommy's was set up in 1992 with the goal of making 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.

Every parent-to-be hopes their baby will be born healthy but every year in the UK one in five pregnancies will end in miscarriage and around 4,000 babies will be stillborn. More than 100 babies are born too small or too soon every day and two percent are severely premature, arriving six weeks before their expected birthday. Premature birth 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 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 for hundreds of babies through our clinical trials. We are examining the processes underlying normal and premature labour, and are 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 we 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.

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# 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.**

Cats are the only animals that can have infected faeces. The organism completes its sexual cycle in the gut of members of the cat family. Following infection through eating birds, mice or other raw meat, a cat can shed infectious faeces for about 14 days. A healthy cat will not normally be a source of infection again. Sick cats may re-shed infected faeces.

## How is it caught?

Toxoplasmosis is caught by eating anything infected or contaminated with the parasite.

Soil where cats have defecated may remain infected for 18 months or more. Humans are at risk because they could accidentally swallow contaminated soil while gardening or when eating inadequately washed fruit or vegetables.

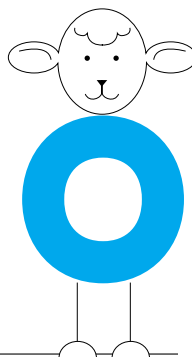
Other animals can become infected when they eat feed contaminated by cat faeces. Humans become infected by eating the meat of these infected animals.

**Undercooked meat is thought to be the main source of human infection.**

Thorough cooking will destroy the organism.

There is a risk of catching toxoplasmosis from lambing or handling newborn lambs. In this instance the organism may enter the body through cuts or abrasions in the skin, or if infected material is splashed in the eye.

The organism has also been isolated from unpasteurised goats' milk, so unpasteurised goats' milk and products made from goats' milk are a possible, although rare source.



Humans may become infected by any of the following routes:

- ingestion of oocysts from soil or water which has been contaminated with cat faeces
- ingestion of viable tissue cysts in raw or undercooked meat
- ingestion of tachyzoites in unpasteurised milk from infected goats
- transplacental transmission after maternal infection
- transmission of tissue cysts or tachyzoites from infected matter combining with human body fluids, for example if, during the process of lambing, infected material splashes into eyes, or open cuts
- transmission of tissue cysts or tachyzoites from transplanted organs or blood products from other humans with acute or latent toxoplasmosis
- inhalation of sporulated oocysts (this is possible but very unusual).

Person-to-person infection is not possible, except *in utero* and following organ transplantation.

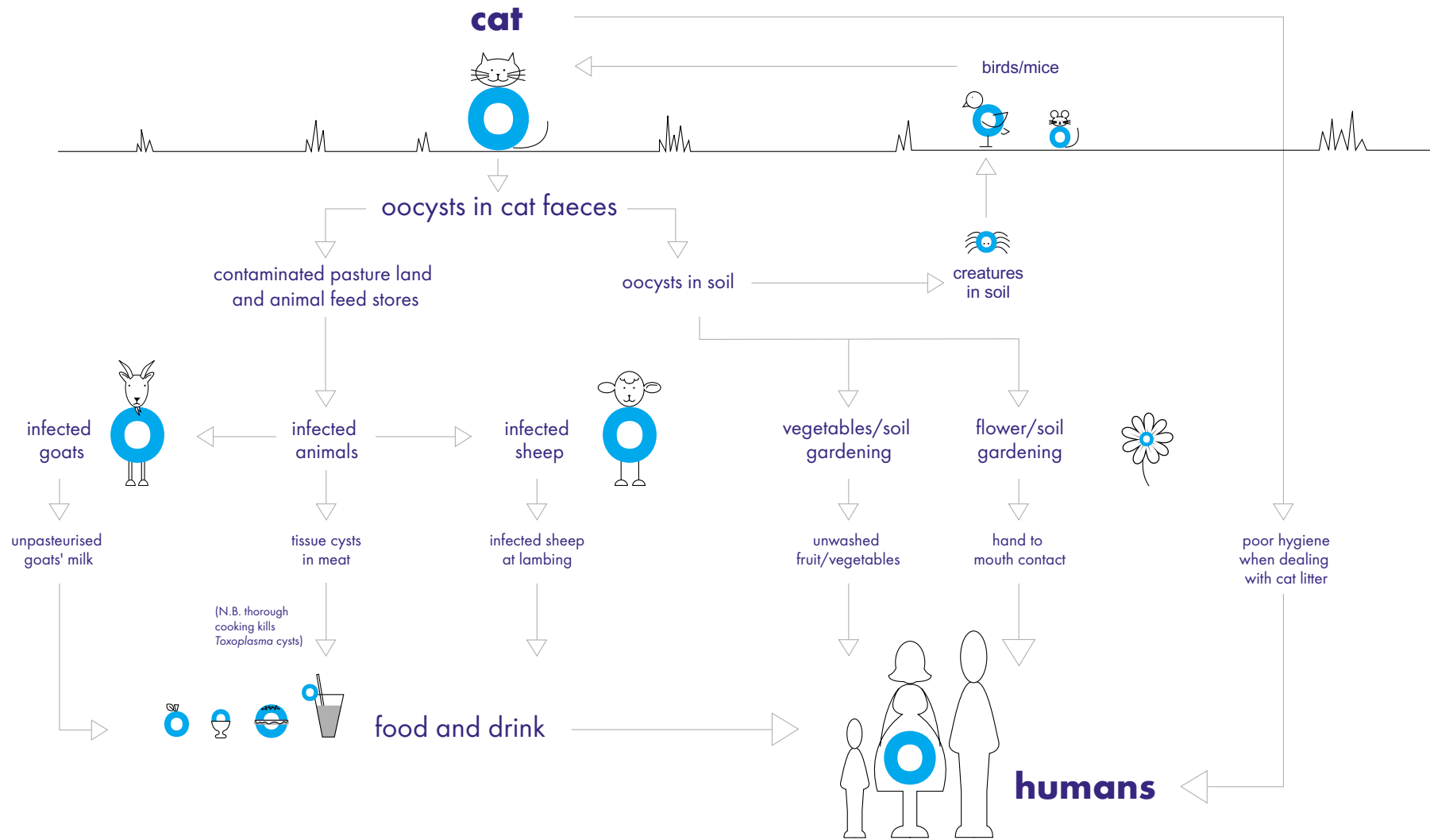
Infection is followed by parasitaemia and the invasion of organs and tissue. The incubation period is 5–23 days. Host immune responses lead to the formation of tissue cysts which contain viable organisms and may persist in the body for decades, even for life.

## Who is at risk?

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 considered protected for life, unless they suffer an impairment of their immune system. Toxoplasmosis is therefore only a significant risk to an unborn baby if the infection is caught by the mother for the first time during pregnancy or within 2–3 months before conception.

Life cycle of *T. gondii*



# Toxoplasmosis in pregnancy

## How common is toxoplasmosis in pregnancy?

Studies have shown that 30% of 30-year-olds and 50% of 70-year-olds in the UK have had a *Toxoplasma* infection. Most of these will not be diagnosed due to the lack of distinct symptoms. In the UK, it is estimated that about 85% of women who book in for antenatal care are susceptible to toxoplasmosis (i.e. only 15% are immune).

Studies carried out in Scotland and Wales suggest that the infection rate in pregnancy is 1 per 500. If this is applied to the current estimated pregnancy rate in the UK of est. 1 million pregnancies per year, then an average of 2000 women annually will acquire toxoplasmosis in pregnancy. About 40% of these women will pass the infection to their unborn babies, so about 800 babies may be infected each year.

## What are the possible effects of toxoplasmosis to the fetus during pregnancy?

The fetus may be:

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

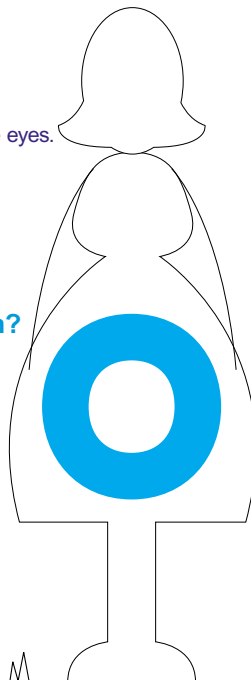
Most babies born with toxoplasmosis have no obvious damage at birth, but some develop symptoms, usually eye damage, during childhood or even adulthood. A few will have more serious symptoms such as blindness and brain damage.

## What is the risk of the fetus acquiring the infection?

If a woman is infected with *Toxoplasma* for the first time during pregnancy or shortly before conception then there is an average 40% risk that the baby will become infected. The degree of risk and severity of damage depends on when the woman acquired the infection.

### *i) Shortly before conception*

Infection shortly before conception carries a 1% risk or below of transmission to the fetus, but a 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 the majority will develop symptoms later in life, usually retinochoroiditis.

## Gestational age, fetal infection and fetal damage associated with *Toxoplasma* infection in pregnancy

**transmission risk  
(mother to fetus)**

15% 25% 65%

**severity of  
damage to fetus**

most less least

1st  
trimester

2nd  
trimester

3rd  
trimester

## Managing toxoplasmosis in pregnancy

There are hygienic precautions that pregnant women can take to avoid infection. There are blood tests that can determine whether or not a woman is immune to toxoplasmosis and diagnose either a current or recent infection. There is antibiotic treatment that helps reduce the chance of fetal infection if a pregnant woman is diagnosed with toxoplasmosis, or limit fetal damage if an unborn baby is diagnosed with toxoplasmosis. Babies born to women who have had a recent or current infection during pregnancy should have a thorough physical examination after birth and be followed up with blood tests during the first year of life.

## Prevention

Pregnant women can be advised as follows:

Avoiding toxoplasmosis
only eat meat which has been thoroughly cooked (i.e. with no trace of blood or pinkness)
avoid raw cured meat, like Parma ham
wash hands, chopping boards and utensils thoroughly after preparing raw meat
wash all fruit and vegetables thoroughly to remove all traces of soil
don't drink unpasteurised goats' milk or eat dairy products made from it
wear gloves when gardening and wash hands and gloves afterward – if you eat while gardening wash your hands first, and try to avoid gardening in areas which may have been soiled with cat faeces
cover children's sandpits to prevent cats using them as litter boxes
remove faeces from cat litter tray every day wearing rubber gloves and wash gloves and hands afterwards – or have someone else do this
do not handle lambing ewes and do not bring lambs into the house

**Some women may have lifestyles or occupations which put them at more risk than others, for example farmers, gardeners, caterers, or people who handle animals. These people should be advised to take extra care or avoid these activities during pregnancy.**

## Testing

If a woman feels she has put herself at risk in pregnancy or would like to know her antibody status prior to pregnancy, she should discuss the benefits and problems of testing with her GP, midwife or obstetrician. If it is decided that it is necessary, then a blood test can be taken. If a woman is concerned about a specific incident then it is necessary to wait 23 days after possible exposure before taking a test, as it takes this period of time for the antibody response to be detected by the blood test.

The initial antibody test is carried out at a local hospital laboratory.

- if the woman is antibody negative, she has never had the infection and needs appropriate information on the prevention of infection
- if the woman is antibody positive (to both IgG and IgM) then the sample will be referred to a Toxoplasma Reference Laboratory for further testing. Medical microbiological experts can estimate the timing of the onset of infection, assess the risk of fetal infection and give advice about further testing and treatment
- an initial positive IgM result does not necessarily mean that she has a current infection, but further blood tests need to be done before this can be ruled out
- if further tests (at the reference laboratory) show that infection has occurred sometime in the past then the woman can be reassured that she has developed immunity and therefore this and future pregnancies are not at risk.

## Treatment

If a pregnant woman has a current *Toxoplasma* infection then the management may be as follows:

1. A specific antibiotic, spiramycin, is used to treat toxoplasmosis in pregnancy. It has been claimed that this reduces the risk of transplacental transmission by about 60%. It has been used in France for more than 25 years, and the majority of evidence suggests that it is safe for the fetus. Given the length of this experience and the potential effects of toxoplasmosis, spiramycin is currently considered safe and effective for use where clinically indicated.
2. The fetus can be tested for infection either by amniocentesis or cordocentesis. Amniotic fluid or fetal blood is tested for the presence of the parasite. Fetal blood can also be tested for antibodies.
3. If infection is found to be present in the fetus, then two antibiotics (pyrimethamine and sulphadiazine) plus folic acid can be administered to the mother. These drugs are active against *Toxoplasma* and may help to arrest the progression of disease in the fetus. However there can be serious teratogenic and haematological side effects with the use of these drugs and the opinion of a paediatric infectious disease physician should be sought.

# Symptoms of congenital toxoplasmosis

4. A detailed ultrasound scan may also be offered to show whether 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.
5. Termination of pregnancy is a choice for women who have a current *Toxoplasma* infection. However, unless infection is detected by amniocentesis or cordocentesis, or an ultrasound shows evidence of fetal damage, then this may mean terminating a healthy, unaffected baby.

Most specialist testing takes place at Toxoplasma Reference Laboratories and expert opinion about the risk to the baby, if any, should be given with blood test results.

Spiramycin is available on a named-patient basis from IDIS World Medicines (Tel: 020 8410 0700); it will not be readily available at the hospital dispensary or local pharmacy. Spiramycin is an expensive drug, and the cost may be prohibitive to some patients.

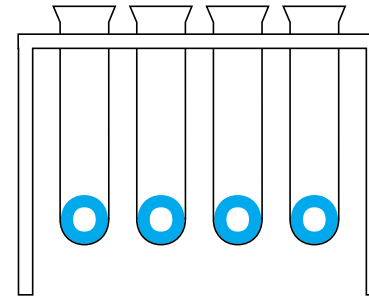
## After the birth

All babies born to women who have had a recent or current *Toxoplasma* infection should have blood taken at birth, a thorough paediatric examination and follow-up blood tests every two months for the first year of life. Reference laboratories may also request placental samples.

A large proportion of congenitally infected babies will be asymptomatic at birth, so the lack of any obvious symptoms at birth does not mean a newborn is not affected.

Newborn blood will show maternal IgG antibody but if IgM or IgA is present this may indicate congenital infection. Comparison of antibody profiles in neonatal and maternal blood (by Western blots) may give a rapid diagnosis of congenital infection. Blood tests should be done every couple of months until the level of maternal IgG falls and is eventually dispersed from the baby's system, which should be within one year. This confirms that it was a maternally acquired antibody and therefore that the baby is not congenitally infected.

If congenital infection is confirmed, sulphadiazine and pyrimethamine (which may be alternated with spiramycin) will be indicated for the first year of life. Regular haematological monitoring will be required as these drugs can affect the blood platelets and marrow. The opinion of a paediatric infectious disease physician should be sought.



## Clinical

This is the clinical disease seen in children infected in early pregnancy and who usually show the symptoms of hydrocephalus, retinochoroiditis and brain lesions due to calcifications. Some children will show more widespread infection with jaundice, fever, anaemia, and microcephaly. These symptoms or signs may appear singly or in combination at birth or in the first few months of life.

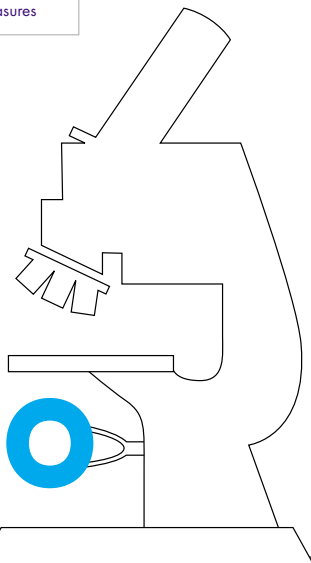
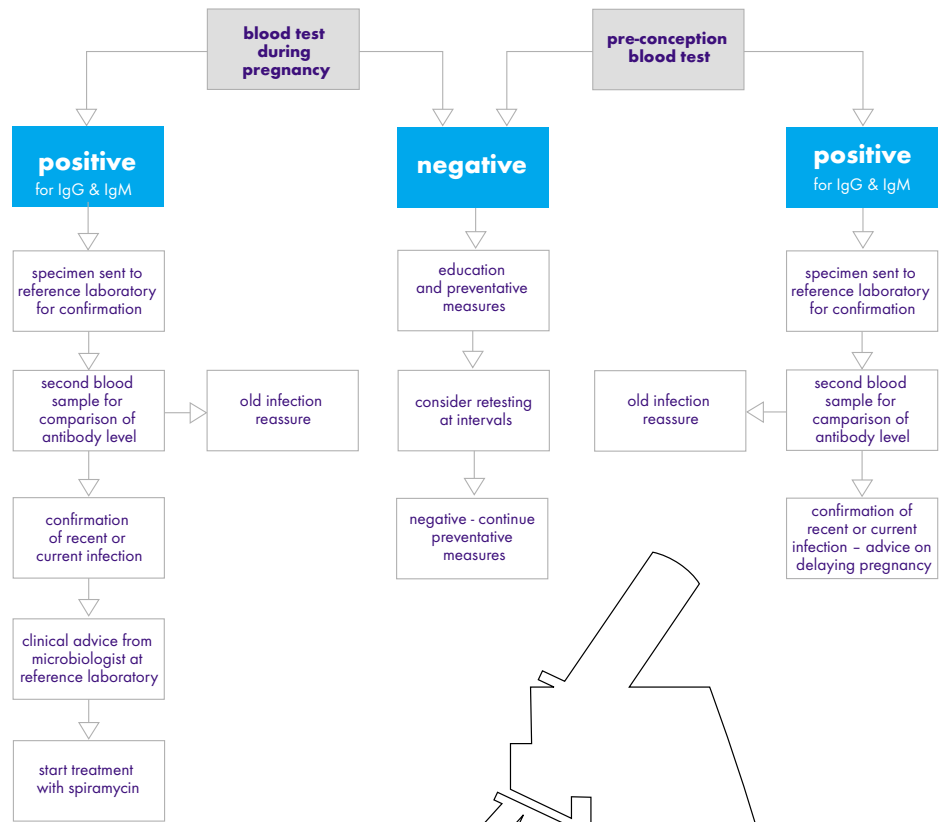
## Subclinical

This is the most frequent form of congenital toxoplasmosis. It usually occurs when transmission to the fetus has occurred late in pregnancy. Babies with this form of congenital toxoplasmosis usually appear normal at birth, but develop symptoms weeks, months, or even years later – particularly retinochoroiditis.

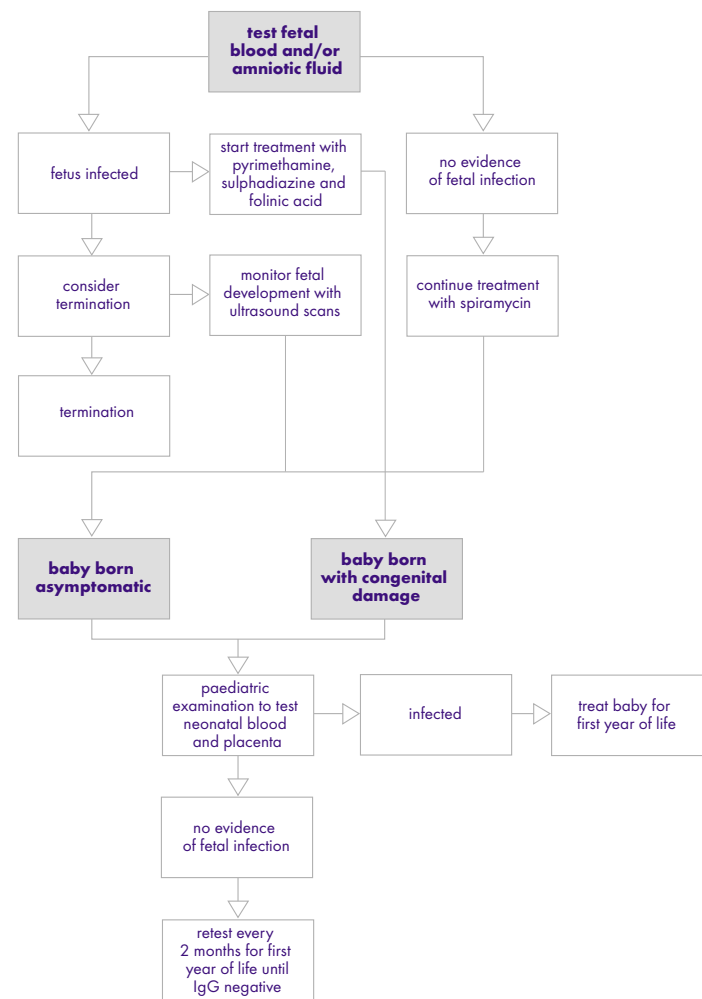
Women with congenital toxoplasmosis themselves, are not at risk of passing the infection to their unborn babies.

## Flow chart for testing and management of Toxoplasma

### Blood Testng for Toxoplasma



### Treatment after spiramycin



## Frequently Asked Questions

### Q My cat had an accident in the house and I cleared it up. Am I at risk?

A There is very little risk from handling cat faeces if you are careful with hygiene. Faeces have to be out of the cat's body for at least 24 hours before becoming infectious. It is better to clear up any mess promptly, wearing gloves and washing hands afterwards, than to leave it for someone else to do later.

### Q Is raw cured/smoked meat, like Parma ham safe to eat?

A No. Meat is safe to eat only if it has been thoroughly cooked.

### Q Can I catch toxoplasmosis from someone else who has it?

A No. Toxoplasmosis only passes from one person to another in the case of a woman to her unborn baby.

### Q If I think I am at risk, how can I tell if I have a current infection?

A Blood tests help experts to estimate when you caught toxoplasmosis, through looking at the type of antibodies present and whether the levels are rising, falling or stable. However, there are disadvantages to having a blood test. You should discuss the matter with your health advisor.

### Q How long do the blood test results take to come back?

A The results may come back in a week, but if they are passed on from a local hospital laboratory to a Reference Laboratory then they will take longer. If you have been waiting for test results for a long time, then your GP or obstetrician may ring the laboratory to find out the results.

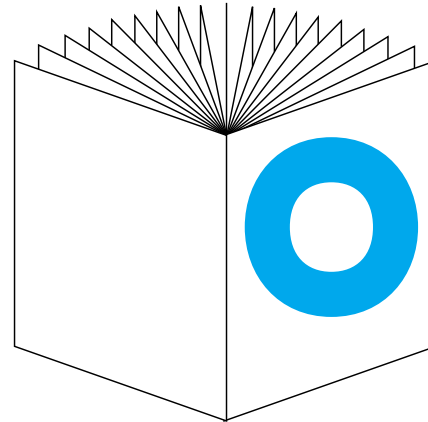
### Q What can an amniocentesis test show?

A Tests on amniotic fluid can often tell if the baby is infected at that time, but they cannot tell whether the baby will be affected in the future or how seriously a baby might be affected.

### Q Can I breastfeed my baby?

A Yes. The parasite has not been isolated in breast milk, and the baby will get antibodies to toxoplasmosis through your milk. It is fine to breastfeed if you have been taking spiramycin.

## Further Reading



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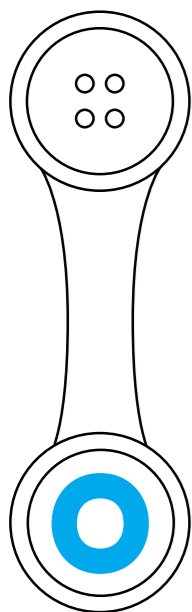
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## What is Tommy's doing to help?

Tommy's has taken over the work of the Toxoplasmosis Trust, an organisation set up to provide information and increase awareness about toxoplasmosis. We have various leaflets about toxoplasmosis which are available by contacting us on the details listed to the right. We are committed to raising awareness about toxoplasmosis, both symptomatic acquired toxoplasmosis and congenital toxoplasmosis.

Tommy's is also setting up a toxoplasmosis support network to enable those people affected by toxoplasmosis to contact others who have been in a similar situation. This will become a register of people who have had an experience with toxoplasmosis and are willing to discuss this with others to help and support them. If you have had an experience with toxoplasmosis and are willing to share your story and talk to other people in the same position, then please contact Tommy's with your details and we can tell you more about this network.



## Where are the Toxoplasma Reference Laboratories?

### The National PHLS Toxoplasma Reference Unit

Singleton Hospital  
Sgeti  
Swansea SA2 8QA  
Wales

Tel: 01792 285055

### The Scottish Toxoplasma Reference Laboratory

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

Tel: 01463 704000

### For more information contact:

#### Tommy's, the baby charity

Nicholas House  
3 Laurence Pountney Hill  
London EC4R 0BB  
Tel: 08707 70 70 70

Fax: 08707 70 70 75

**Pregnancy information line: 0870 777 30 60**

E-mail: [info@tommys.org](mailto:info@tommys.org)

Website: [www.tommys.org](http://www.tommys.org)

## Help us save babies' 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.

<b>Your details</b>	Name	Address
		Postcode
Telephone	Email	

### Giving regularly

Bank name	Bank address
	Postcode
Name of account holder	

Sort code   -   -   Bank a/c no

Please pay Tommy's, the baby charity, the sum of £  per month/year (delete as appropriate)

starting from   /   /   and until further notice. (Please ensure the start date is at least one month from today's date.)

**For bank use only**, please quote reference

To the National Westminster Bank plc, PO Box 7929, 91 Westminster Bridge Road, London, SE1 7ZB for the credit of Tommy's, the baby charity. Account no 26142058, sort code 60-60-04.

Signature	Date
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Date

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Please return this form to Tommy's, Nicholas House, 3 Laurence Pountney Hill, London EC4R 0BB

ToxoTH/04