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Typhoid and paratyphoid fever

Typhoid and paratyphoid fever are infections caused by related but different strains of germs (bacteria). The two diseases are similar, and are both called enteric fevers, although paratyphoid is less severe. They are usually caught through the intake (ingestion) of contaminated food or water.

These infections are most common in countries with poor sanitation. Common initial symptoms are high temperature (fever) and headache but more serious problems can develop if not treated. Treatment with antibiotic medication usually works well. Without treatment, about 1 in 5 people with typhoid die, although paratyphoid is not usually fatal. Careful hand washing and drinking bottled water can help to prevent you from getting typhoid. You should also boil, cook or peel food before eating it while in areas where typhoid is common. Vaccines can also help to prevent typhoid, so it is sensible to be vaccinated before you travel to an area where the risk of typhoid is significant.

What are typhoid and paratyphoid fever?

Typhoid fever is an infection caused by the germ (bacterium) [Salmonella typhi](#). This can cause a serious illness which can be fatal if not treated rapidly with antibiotics.

Paratyphoid fever is an infection which is similar but has milder symptoms. This is caused by the bacterium *Salmonella paratyphi*. There are three strains of *Salmonella* paratyphoid: often called strains A B and C. A is the most common worldwide, although B is more common in Europe. C is rare.

The bacteria are shortened to *S. typhi* and *S. paratyphi* for the remainder of this leaflet.

The diseases are known by various other names, such as gastric fever, enteric fever, abdominal typhus, infantile remittent fever, slow fever, nervous fever and pythogenic fever. The name typhoid means 'resembling typhus'. However, although there can be some similar symptoms, typhus is a completely separate disease.

Where is typhoid fever most commonly found?

The germs (bacteria) causing typhoid and paratyphoid fever are found most commonly in situations where:

- Good standards of hygiene are not maintained.
- Good standards of hygiene cannot be maintained because of the lack of clean running water and of the safe disposal of waste water.

According to the World Health Organization (WHO), typhoid and paratyphoid fever are now most commonly found in Southeast Asia and sub-Saharan Africa.

On a worldwide scale, the occurrence of typhoid and paratyphoid fever reduced dramatically through the twentieth century. This was partly due to improved access to clean water and sanitation and to better understanding of hygiene. It was also due to the discovery of antibiotics which can treat the disease.

In the UK, typhoid fever is called a notifiable disease. This means that if you are found to be infected your doctor is obliged to inform the local public health doctors. They have a responsibility for monitoring and responding to disease outbreaks in the community. The public health doctors will want to know where you acquired the infection, to make sure there is no public health risk.

How common is typhoid fever?

An estimated 9 million cases and 110,000 typhoid-related deaths occur annually worldwide. Children are much more often affected than adults.

The most common typhoid fever infections in the UK in recent years have been among people who have visited friends and family in the Indian subcontinent. Each year there are about 500 cases of typhoid in the UK in people returning from these areas. About half are in London.

If you're travelling, you can find out if a country you're visiting carries a high risk of typhoid by visiting the **NHS Fitfortravel** website.

How do you get typhoid fever?

You get typhoid fever from other infected people by eating or drinking contaminated food or water. The germs (bacteria) are passed out in the stools (faeces) and urine of infected individuals. They can get into food and water because people who handle food (such as cooks or restaurant workers) may not know that they are infected.

It is possible to have typhoid or paratyphoid fever but to have no symptoms or signs of the infection. Humans are the only carriers of these infections. Typhoid and paratyphoid fever are not passed on by animals.

How does typhoid fever make you ill?

The germs (bacteria) enter your body through the gut. They sit in your immune system (glands and lymph vessels) and multiply there. They then enter the bloodstream, which is when most people experience symptoms of headache and high temperature (fever). Through the bloodstream they enter various organs, particularly the liver, spleen, gallbladder and bone marrow. Because bile produced by the gallbladder is squirted into the gut, the bowels then get infected again.

Symptoms of typhoid fever

The incubation period is the time from ingesting the germs (bacteria) until the time you actually start to feel ill. It depends on how many bacteria you have swallowed. It is usually between seven and fourteen days, but can be as short as three days, or as long as 30 days.

Untreated, the illness usually lasts for three to four weeks, but may be longer in a small number of cases. Symptoms vary from mild to severe and life-threatening. Lack of fluid in the body (dehydration) is a risk.

About 1 in 300 people infected with typhoid fever may have a low-grade infection. They may not develop any significant symptoms, and then become carriers of the disease.

- **Raised temperature (fever)** and **headache** are the most common symptoms. Typically, the temperature increases gradually day by day during the first week. People usually experience raised temperature mostly in the evenings.
- Rash (rose-coloured spots which lose their colour with pressure).
- Stomach pains.
- Loss of appetite.
- **Diarrhoea** - more common in children.
- Severe **constipation** - more common in adults.
- **Feeling sick (nausea)**.
- **Cough**.

The typical pattern of illness consists of four stages, each lasting about a week. Over the course of these stages, you become tired and may lose weight dramatically.

- In the first week, the body temperature rises slowly, and may go up and down, with headache, cough and feeling unwell. **Nosebleeds** are common.
- In the second week there is a high fever of around 40°C (104°F) - often worse in the afternoon - although the pulse is often slower than expected with a high fever. Some patients get 'rose spots' on the lower chest and stomach. Some patients become confused ('delirious') with the fever, which earned typhoid the name 'nervous fever'. Tummy pain and diarrhoea are common, and stools (faeces) are often green. There may be swelling of the liver and spleen, which your doctor may be able to feel.
- In the third week of typhoid fever, serious complications can occur (see below).
- By the end of third week, the fever starts subsiding. This carries on into the fourth and final week.

Symptoms of paratyphoid fever

Paratyphoid fever is similar to typhoid; but it tends to come on more quickly, have milder symptoms, and last for a shorter time.

Early symptoms can be vague chills, sweating, headache, weakness, cough, loss of appetite, sore throat, dizziness and muscle pains. These are frequently present before the onset of high temperature (fever).

Symptoms of paratyphoid are of:

- Persistent fever.
- Headache.
- **Tummy (abdominal) pain** (in about a third of patients).
- Feeling unwell.
- Loss of appetite.
- Dry cough (this occurs early).
- Slow heart rate.
- Swelling of the liver and spleen.
- Rosy spots on the central body (in about a third of patients).
- Constipation (more common than diarrhoea).
- Very rarely, patients can suffer mental disorder (**psychosis**), confusion, and seizures.

What are the possible complications?

About 1 in 10 people with typhoid or paratyphoid fever infections have complications. These can occur at any time while you have the infection, even if you have a mild infection.

The two most common complications are **bleeding from the bowel** and **rupture (perforation) of the bowel**. These occur in about 2 in 100 cases. These may be life-threatening and may require a surgical operation.

Other possible complications include:

- Infection of the heart muscle ([myocarditis](#)) occurs in up to 1 in 20 cases. It is a significant cause of death in areas where typhoid and paratyphoid fever are commonly found.
- Infection of the nervous system ([encephalitis](#)) can cause severe confusion, epileptic seizures and mental health disturbances.
- Liver and gallbladder infection may cause yellowing of the skin and of the whites of the eyes ([jaundice](#)) and severe tummy (abdominal) pain.
- Inflammation of the pancreas ([pancreatitis](#)) is very rare. This can cause severe pain in the stomach or back, and [indigestion](#).
- [Kidney failure](#) (in which the kidneys no longer clear toxins from the blood) is also uncommon.
- Abscesses around the body.
- Lack of fluid in the body ([dehydration](#)).
- Uncommonly, a fall in the platelet cells in the blood which leads to bruising and bleeding.

Note: if you have any new symptoms, or feel worse while you are being treated for typhoid, you should contact your doctor as soon as possible.

When to seek medical advice

Be aware if you or your child have travelled to an area known to have a risk of typhoid infections, or have been in a situation where hygiene has been poor. If you experience headache, high temperature (fever), tummy (abdominal) pains, cough or diarrhoea you should seek medical advice. This is the case even if you have been vaccinated against typhoid fever, as vaccination does not guarantee complete protection.

How are typhoid and paratyphoid fever diagnosed?

Your doctor will take note of where you travelled, the conditions you stayed in and what you did while you were there. He or she will ask about your symptoms, and will examine you. These are all very important, as it is very difficult to find typhoid and paratyphoid fever in the body, even if you have these infections.

Tests your doctor may carry out

- **Stool (faeces), blood and urine** samples are sent to the laboratory for culture (in which the germs (bacteria) are helped to reproduce and be identified). This test may fail to identify about one third of cases even when bacteria are present. It may also take some days for results to come back.
- **Widal's test** - this is a blood test which checks for proteins (antibodies) which help to fight *S. typhi* or *S. paratyphi*. Again, however, this may miss about one third of cases.

Further tests in hospital

- **Blood culture** - a blood sample is sent for culture to see if the bacteria are present.
- **Bone marrow aspiration** - a needle is used to take a sample of bone marrow fluid. A bone marrow sample is positive in 90% of cases if it is taken during the first week of the illness. It may be more difficult to find after that.

If your travel history and symptoms suggest that you have typhoid or paratyphoid fever, the doctor may start treatment before the results of the tests are available.

Typhoid fever treatment

You may need to be admitted to hospital for these infections to be treated.

- **Antibiotic medication:** this should be started as soon as possible. Antibiotics will reduce your chances of serious complications. They will also make you feel better more quickly. You will be asked to keep taking them until six consecutive negative stool (faeces) and urine tests have been obtained.
- **Have plenty to drink** to prevent lack of fluid in the body (dehydration). Sometimes a drip where fluid is put directly into the vein is needed.
- **Medication to lower your temperature** may be needed.

Those caring for you must be particularly careful with hand washing and the disposal of faeces and urine. If you are looking after a friend or relative with typhoid or paratyphoid infection then observe the best possible hand washing techniques and hygiene practices.

How to wash your hands properly

- Wet both hands with water.
- Cover both hands with soap.
- Rub your palms and in between your fingers together.
- Rub the backs of your hands and in between your fingers.
- Interlock your fingers and rub the tips of your fingers and nails together.
- Wash each thumb including the nail separately with each hand.
- Rinse both hands thoroughly.
- Dry hands with a single-use hand towel or a hand dryer.
- Use the towel to turn off the tap.

Safe disposal of urine and faeces

- It is best to flush urine and faeces into the toilet immediately.
- Make sure the toilet is cleaned with disinfectant daily
- If a potty is used, flush the contents into the toilet.
- Wash the potty with warm water and disinfectant.

- Turn it upside down to dry.
- If a nappy is worn, change the nappy, using gloves if possible.
- Flush any faeces into the toilet.
- Always make sure you wash your hands thoroughly after changing the nappy.
- If sheets, bedding or clothes are soiled, remove them as soon as possible using gloves if they are available. Wash them separately from unsoiled items, with hot water.
- Wash your hands after handling the soiled items.

Advice for people who work with food

Typhoid and paratyphoid are known to be easy to pass on, even after symptoms have stopped and you feel better.

If you work with food, you should inform your employer if:

- You have, or are suspected of having, typhoid or paratyphoid fever.
- You have had it in the past.
- You have had contact with someone who has had typhoid or paratyphoid fever.

You should be excluded from food handling and food handling areas until you have been cleared to return to work by a medical professional.

If the person is confirmed as being infected or is a carrier of the germs (bacteria), the exclusion period may take three months or more. This is to allow for treatment and confirmation of clearance of infection, through stool testing.

How long should someone with typhoid or paratyphoid fever stay away from work, school or nursery?

Adults and children aged over 5 years can go back to work/school as soon as their illness is better, and they have no diarrhoea. They must continue to observe good standards of hygiene and hand washing. An exception to this is if you work with food (see section above), in which case you need to be fully cleared by a health professional to return to work. In the UK, public health doctors are likely to be involved in advising when it is safe for you to return.

People working with vulnerable groups such as the very young, elderly or those in poor health, should tell their employer of their illness. They must also stay off work until tests show that the germs (bacteria) have cleared from stool (faeces) specimens in three stool samples taken at weekly intervals.

Children aged under 5 years should stay away from nurseries, playgroups, etc, until tests show that the bacteria have cleared from stool specimens in three stool samples taken at weekly intervals.

What is the outlook (prognosis)?

Without antibiotics, about 1 in 5 people will die from a typhoid infection. Paratyphoid is usually less severe and not usually fatal.

With treatment with antibiotics, most people make a full recovery but about 1 in 10 people have a recurrence of the illness (relapse). This usually happens a week after stopping the antibiotics but it can be much later. A further course of antibiotics will usually work if you have a relapse.

How can I prevent getting typhoid fever?

Avoid getting typhoid and paratyphoid fever while you are abroad

It is very important to be careful of what you eat and drink and to wash your hands thoroughly after using the toilet, before eating and before preparing food:

- Only eat food that is freshly prepared, cooked and served piping hot, or fruit that you have peeled yourself, such as banana and mango.
- Only drink bottled or cooled boiled water.

- When drinking bottled water, ensure the seal is unbroken or choose sparkling water to ensure the bottle has not been refilled.
- Only drink pasteurised milk.
- Wash your hands frequently using soap and water or hand sanitiser.
- Always wash your hands or use hand sanitiser before preparing food, eating or drinking, and after using the toilet.
- Use bottled or boiled water to brush your teeth. Do not use tap water.

You should avoid:

- Uncooked food such as salads.
- Raw or uncooked shellfish.
- Buffets (if you have to eat at a buffet, choose steaming hot dishes).
- Unpasteurised milk and cheese.
- Ice cubes (to keep drinks cold, put the container or glass on ice, do not put ice in your drinks).
- Tap water.
- Ice-cream products.
- Cold desserts in restaurants.
- Leftovers.

Typhoid vaccination

Vaccination against typhoid fever is available free of charge on the NHS in the UK. People who should have the vaccine are:

- Travellers to countries where typhoid fever is common (South Asia, Southeast Asia, Middle East, Central and South America and Africa) – especially if staying with, or visiting, the local population.
- Travellers to areas with frequent and/or prolonged exposure to conditions where sanitation and food hygiene are likely to be poor.
- Laboratory personnel who may handle *S. typhi* in the course of their work.

If you are going to travel to a country where typhoid fever is common, you should visit your practice nurse, GP or travel clinic at least two weeks before you are due to travel. [See the separate leaflet called Typhoid Vaccine.](#) There is no vaccine against paratyphoid fever.

Dr Mary Lowth is an author or the original author of this leaflet.

Further reading

- [Typhoid](#); World Health Organization
- [Immunisation against infectious disease - the Green Book \(latest edition\)](#); UK Health Security Agency.
- [Gal-Mor O, Boyle EC, Grassl GA](#); Same species, different diseases: how and why typhoidal and non-typhoidal Salmonella enterica serovars differ. *Front Microbiol.* 2014 Aug 4;5:391. doi: 10.3389/fmicb.2014.00391. eCollection 2014.
- [Gibani MM, Britto C, Pollard AJ](#); Typhoid and paratyphoid fever: a call to action. *Curr Opin Infect Dis.* 2018 Oct;31(5):440-448. doi: 10.1097/QCO.0000000000000479.

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Authored by:	Peer Reviewed by: Dr Hayley Willacy, FRCGP	
Originally Published: 19/11/2023	Next review date: 16/03/2023	Document ID: doc_13780

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