

Dengue

Dengue (which used to be called dengue fever) is a viral illness which is very common in the tropics and subtropics. It is usually a flu-like illness lasting under a week but it can sometimes be very serious, even fatal.

What is dengue?

Dengue is a mosquito-borne viral illness carried by the *Aedes* mosquito. Dengue fever is the non-severe type and dengue haemorrhagic fever is when the illness is more severe. It is called haemorrhagic because people with it are more likely to have symptoms related to bleeding such as nosebleeds and bleeding gums.

There are currently thought to be at least five different 'strains' of the dengue virus, although only the first four seem to infect humans. The virus is from the same family of viruses as yellow fever, and as [chikungunya](#) virus (which can be similar to dengue).

Dengue probably only became a human disease about 800 years ago, when it 'jumped' into human populations from monkeys. It was restricted to a very few parts of the world until the middle of the twentieth century, when the disruption caused by the Second World War, followed by the increase in cargo transport and globalisation, carried the mosquitoes all around the world.

What are the symptoms of dengue?

Non-severe type

The incubation period of dengue is usually 4-10 days. This is the time from when you have been bitten, to when you first start to have symptoms.

Dengue is a flu-like illness, and patients experience headache, muscle pain and **high temperature (fever)**. There is often a rash, which usually (but not always) blanches on pressure. Where symptoms occur, the illness typically begins with a sudden, high fever (39.5–41°C/104°F). The fever comes and goes over about two days. Other symptoms include:

- Severe headache.
- Headache behind the eyes.
- Muscle and joint pains.
- Feeling sick (**nausea**), being sick (vomiting) – particularly in children.
- Swollen glands.
- Rash, which usually pales when pressed with a glass.
- Symptoms which usually last for 2–7 days.

A measles-like rash often occurs. This may be a blotchy red rash which may run together so that it looks like 'islands of white in a sea of red'. Small red spots that do not disappear when the skin is pressed may also appear.

In non-severe dengue the fever then resolves and the patient recovers. In dengue with warning signs another 'phase' of the disease develops.

Dengue with warning signs

Warning signs may develop 3–7 days into the illness. The temperature often falls but those affected may experience:

- Severe tummy pain.
- Persistent vomiting, sometimes with blood in the vomit.
- Fast breathing.
- Tiredness.
- Feeling of physical restlessness.
- Purple spots or blotches on the skin, which may not fade when pressed with a glass.
- Nosebleeds (epistaxes).

- Bleeding gums.
- Tummy pain.
- Heavier than usual periods.
- [Low blood pressure](#) and slow heart rate.
- Swollen glands.

These symptoms are considered warning signs. This means that they increase the chance that the affected person may progress to the more severe form of the disease. Patients with warning signs need regular monitoring.

Severe dengue

People living with severe dengue are very sick, with shock, collapse and, often, bleeding. The symptoms seen in dengue with warning signs may occur and may be more severe. Facial swelling is sometimes seen and there may be problems with vision. They may be shocked and collapsed and they may experience problems of the heart, liver, lungs and circulation.

Severe dengue is a life-threatening illness.

Where is dengue fever found?

There is greatest risk of dengue if you visit an area where dengue mosquitoes are present, whilst there is a current outbreak, as this means that there are large numbers of infected people and, therefore, many infected mosquitoes. This is most likely in cities, where people are more crowded. It's also more likely if public hygiene and sanitation are poor so that there are many mosquitoes.

Dengue is carried by mosquitoes in warmer parts of the world, including Africa, South America, the Eastern Mediterranean, Southeast Asia and the Western Pacific. There have also been outbreaks in the southern states of the USA.

How common is it in the UK?

300-400 cases of dengue occur each year in the UK, in travellers returning from countries where dengue is common. It is likely that many other mild cases go undetected.

How does a dengue epidemic occur?

Dengue epidemics occur when many infected people are close together in an area where there are many biting *Aedes* mosquitoes. If there are large numbers of people carrying the virus then the mosquitoes are more likely to become infected, and if there are a lot of infected mosquitoes biting then more people will be infected.

How dengue is spread

You can only catch dengue through being bitten by an infected mosquito. You can't catch dengue from another person. Dengue virus is transmitted by the bite of an infected *Aedes* mosquito – most commonly a mosquito called *Aedes aegypti*.

This mosquito likes to be where there is human development – it prefers to lay its eggs in man-made water containers. The mosquito feeds in daylight in the early morning or late afternoon, so night-time mosquito nets are not sufficient protection. Only the female *Aedes* mosquito feeds on blood.

The mosquito has stripy legs. The same species of mosquito can also transmit chikungunya fever, yellow fever and Zika virus, if they are present in the local population.

In order for the mosquito to become infected it needs to feed on a person who has large amounts of virus in the blood; this happens early in a case of dengue, often before people know that they are infected. The virus needs to live for 8–12 days in the mosquito before it is capable of being passed on to another person. The mosquito remains infected with dengue for the remainder of its life, which might be days or a few weeks.

How is dengue diagnosed?

Non-severe

Dengue is often not diagnosed at all. When symptoms are mild or non-existent you may never know that you have had the infection.

Symptomatic dengue can mimic many other illnesses. Some of these illnesses are more common in returning travellers than others. If you have been in the middle of a dengue outbreak then you will know that dengue is a possible cause of your symptoms, and you must mention this to your doctor.

Most doctors in the UK will not have treated cases of dengue: only about 400 cases a year are diagnosed in the UK. Your doctor will usually want to test you for malaria if you have returned from a malarial zone with a high temperature (fever). The malaria blood test will not detect dengue, so the doctor will need to test you specifically for dengue. Dengue resembles so many other conditions that the only way to make the diagnosis certainly is through blood tests.

Severe dengue

Even severe dengue can be confused with several other conditions, although there are fewer possibilities and you will be tested for all of them.

Your doctor will only think to test you for dengue if they are aware that you have recently travelled abroad to a dengue area. Always remember to tell your doctor about recent foreign travel, especially if you have a fever.

If you are suspected of having dengue then blood tests will be performed to look for signs of the virus in your blood. Doctors can also look for antibodies in the blood suggesting recent or previous dengue. Blood tests will also be used to check on how severe the infection is.

Why do some people get severe dengue?

Severe dengue normally occurs only with a second attack of dengue caused by a different strain of dengue virus to your previous attack. It mainly affects children and is extremely rare in returning travellers.

The symptoms of dengue are mainly caused by our own immune systems responding to the virus. In the case of severe dengue the immune system responds dramatically, producing destructive substances which damage organs and make fluid leak from blood vessels. Children and young adults tend to have the most reactive immune systems, and this is thought to be why they are more likely to get severe dengue compared with older people.

90% of severe dengue cases occur in children aged less than 15 years.

Can dengue happen twice?

You can have dengue more than once. A second dengue infection is more likely to be serious.

There are four types of dengue virus – and once you have had one dengue virus you remain immune to the particular strain – but you are not immune to the other types.

What is recovering from dengue like?

Most cases of dengue end with a 'recovery phase'. Patients are often very itchy, and where there has been a rash the skin may peel. There may be a new rash, which may or may not blanch on pressing, and patients feel tired. Rarely, a fit (seizure) can occur.

How is dengue treated?

Non-severe

There is no specific treatment for dengue. If your symptoms are mild then paracetamol is helpful for the headache and aching muscles which are typical of dengue.

Dengue with warning symptoms

If you are diagnosed with dengue and go on to develop some of the warning symptoms then you are likely to be kept in hospital for observation until things settle down, in case you develop severe dengue.

Severe dengue

Patients with severe dengue can quickly become severely unwell – close monitoring is needed. Treatment will include:

- Fever control with paracetamol, tepid sponging and fans.
- Intravenous fluids which are likely to be needed, as severe dengue causes fluid to leak from veins and arteries into the surrounding tissues. You will be closely monitored, with regular blood tests.
- In very severe cases, intensive care may be needed to support vital organs whilst the disease runs its course.
- Treatment for secondary bacterial infections, which commonly occur.
- Blood products, which may also be needed.

Is dengue dangerous in pregnancy?

If a pregnant woman contracts dengue in early pregnancy there is an increased chance of miscarriage. Dengue can also be dangerous to the developing baby later in pregnancy, particularly if it is the mother's second infection. Both she and her baby can develop severe dengue.

What are the complications of dengue?

There are usually no complications – an attack of dengue is most commonly like having the flu. When the patient's appetite returns this is a good sign of recovery, although tiredness and depression can last for some weeks after recovery.

Severe dengue is a life-threatening infection. Around 1 in 100 patients with dengue will die, but around 5 in 100 of patients with severe dengue will die (the figure is much higher if the patient is not treated in hospital).

Most severe dengue and most deaths occur in children aged less than 15 years; however, in recent years the number of deaths in young adults has increased.

Is there a dengue vaccine?

There is one licensed dengue vaccine at the moment, which is only partially effective, although others are being developed. Any vaccine needs to protect against all four strains of dengue – and against any new strains that emerge in the future. The current dengue vaccine is not available in the UK.

We know that immunity to one strain of dengue makes infection with another strain of dengue more severe, and potentially dangerous. The concern with dengue vaccine has always been that, by making you immune to one strain of dengue, infection with other strains would be more dangerous.

The current dengue vaccine seems to prevent about 2/3 of cases of severe dengue, and to be more effective in preventing second attacks of dengue in children who have already had one attack. It is available for people aged 9–45 years who live in dengue-affected areas. It is licensed in Indonesia, the Philippines, Mexico, Brazil, El Salvador, Costa Rica and Paraguay.

How can I avoid catching dengue?

If you have a choice about when and where you travel, avoid travelling to areas where there is a dengue outbreak.

Mosquito nets will not protect against the *Aedes* mosquito, as it bites during the day. Insect repellents, particularly those containing N,N-diethyl-3-methylbenzamide (DEET), will prevent mosquito bites and therefore the chance of catching dengue.

Consider using permethrin or other repellent to further repel mosquitoes from your clothing, and wear long-sleeved shirts and long trousers, and other clothes that cover exposed skin.

What other conditions are like dengue?

Because dengue is a flu-like illness, any illness which can cause fever and aching can mimic dengue.

If you have travelled to a region where dengue is present and you develop a fever, then dengue is one possible cause. Other causes of fever in returning travellers include:

- [Malaria](#) (a common cause of fever in a sick returning traveller).
- [Typhoid fever](#).
- Typhus.
- [Chikungunya virus](#).
- [Yellow fever](#).
- [Lyme disease](#).
- Other more rare haemorrhagic fevers – for example, Hantavirus, Ebola, and Lassa fever.
- New infection with [HIV](#).
- [Meningitis](#).
- [Weil's disease \(leptospirosis\)](#).
- [Influenza](#).
- [Kawasaki disease](#).

This list is not complete; there are many other infections which can cause a fever with flu-like symptoms. Your doctor will want to talk about where you have been, what exposure you have had to biting insects, what immunity you already have and exactly what your symptoms are in order to work out which conditions you are likely to have.

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

Further reading

- [Dengue fever](#); National Travel Health Network and Centre (NaTHNaC)
- [Dengue and severe dengue](#); World Health Organization, Jan 2022
- [Dengue Clinical Guide – Treatment Algorithm](#); Centers for Disease Control and Prevention

- [Kularatne SA, Dalugama C](#); Dengue infection: Global importance, immunopathology and management. Clin Med (Lond). 2022 Jan;22(1):9-13. doi: 10.7861/clinmed.2021-0791.

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