

Is my body temperature too hot? Do I have a fever?

Written by Dr Katie Stephens, GP

Dr Katie graduated from the University of Manchester in 2007 (MBChB) and completed her GP training in the West Midlands in 2012 (MRCGP).

Why does our body temperature go up?

A textbook 'normal' body temperature is 36.7°C but in reality 'normal' is more of a range around this, and fluctuations can be expected due to a whole host of causes. Some of these causes may be external factors such as changes in the temperature of the environment we are in or what we are wearing, and internal factors, such as hormonal changes and infections.



Under normal circumstances, our body constantly works to maintain 'homeostasis' – ie keeping our core temperature of our inner organs within an optimal range. If we get too hot or too cold and go outside this range, this can be dangerous. One of the ways it does this is by varying the amount of blood it is diverting to its surface. If we go out for a run, we might return looking a bit red. This is because our body heats up while we are exercising. To cool it down, it opens up more of the

blood vessels near the surface of our skin (hence the flushed appearance many people get). As more of our (warm) blood travels superficially, our skin becomes warmer and some of this heat is lost to the air around us, leading to our body temperature dropping. Sweating is another way our body cools us down as it takes heat energy for sweat to evaporate from our skin.

The same blood diversion process can happen in reverse – if you forget your coat when outside in the cold, your body temperature can drop. To

keep the core body temperature from dropping too low, blood is then diverted *away* from the superficial vessels and the skin and towards the centre, limiting further heat loss and keeping the internal organs toasty.



When we get an infection, this can cause our body temperature to rise. Both the infecting germs themselves, as well as our immune system's response to them, can act on the part of our brain that helps regulate temperature, leading to us getting warmer. This type of 'high temperature' would be called a fever, or in

medical-speak, 'pyrexia'. (In this article, 'high temperature' and 'fever' are used interchangeably.)

Somewhat controversially, the raised temperature itself is not always a bad thing. There is some evidence that a raised temperature might make it harder for the invading infection to multiply and grow¹. Additionally, it may fast-track some of our own immune cells (specifically 'neutrophils' for any budding immunologists) to the site of the infection more quickly, helping to boost the efficiency of our immune system².

However, it's not all good news – while of course feeling unpleasant, getting too hot can also be dangerous for us and cause serious internal damage. 'Too hot' means different numbers at different ages although this is fortunately quite rare given how well our bodies can normally cool themselves down when needed.

What is a high temperature at different ages?

While I've listed certain cut off numbers here, doctors are advised to take parents' reports of a child feeling hot to touch as a sign of a fever, regardless of the thermometer reading.

Also, thermometers can become less accurate with time and ideally should be recalibrated at certain periods.

In general, 37.5°C – 37.9°C is considered a mild or 'low grade' raised temperature/fever. This isn't normally worrying, but also isn't normal, and could suggest an underlying infection. 38°C and above is considered 'a proper fever'. However, the normal body temperature can fluctuate somewhat with age and doctors have a lower threshold for a raised temperature being a concerning sign at younger ages.

What is high temperature in babies?

UK GPs will often refer to the National Institute of Health and Clinical Excellence's Traffic Light System for Identifying Risk of Serious Illness when evaluating children 5y and younger with a fever. This is a handy tool that breaks up different sections of the child's appearance and examination findings into Green (low risk of serious illness), Amber (intermediate risk) and Red (high risk). This is because fever in itself isn't the only important clue as to how unwell someone may be. Of course, it is intended for use by healthcare professionals with medical training when evaluating the child as a whole, but is useful to mention here with regards to temperature cut-offs.

The Traffic Light System advises that a temperature of 38°C or higher in babies under 3 months old is considered Red, or high risk of serious illness. Babies age 3 – 6 months with a temperature of 39°C or higher would score Amber (intermediate risk) based on their temperature although of course their overall risk is dependent on multiple other factors³. (If your child falls into one of these categories please seek prompt medical attention now.)

What is high temperature in children?

Children over the age of 6 months aren't classed as increased or high risk based on temperature, only on other parts of how they look.

If your child has a high temperature, the NHS has a very useful guide on measures that can be helpful and detailed bullet points on when to be concerned and when to seek urgent medical help. You can read this [here](#)⁴. If you are concerned that your child may be unwell with the fever, please seek prompt medical attention now, as set out in the NHS guide.

What is high temperature in adults?

Adults don't really get any special treatment when it comes to raised temperatures until they become more elderly. So this means that for healthy, non-elderly adults, as explained above, 37.5°C – 37.9°C is considered a mild or 'low grade' raised temperature/fever. This isn't necessarily worrying on its own, but also isn't normal, and could suggest an underlying infection. 38°C and above is considered 'a proper fever'.

What is high temperature in the elderly?

It isn't uncommon for an elderly person to have a slightly lower body temperature than a younger adult. This may be partly why 20 – 30% of elderly patients with an infection may either not have a detectable fever at all⁵. A significant proportion of elderly patients with an infection may also have a high temperature eventually but delayed by a number of hours compared to a younger adult, and their temperature may not get as high as a younger person's would under the same circumstances⁵. If an elderly person does have 'a proper fever', this can signify a more severe type of infection compared to a younger adult with the same temperature reading⁵.

What should we do about a high temperature?

Hydrate, hydrate, hydrate

First thing's first – grab a big drink! When someone is very poorly with an infection and admitted to the hospital, they aren't only given medication but also fluids into a vein. This demonstrates how when we have an infection, we need extra fluids to help fight it off. Not only that but a raised temperature means we will lose more fluids to our environment, eg through sweating, and these fluids need replacing. Being dehydrated and having a fever at the same time can be dangerous and make someone even more ill.



A good way to assess if you are dehydrated or not is looking at the colour and amount of your urine. If it is quite yellow or dark or you haven't had a wee in quite a few hours, get another drink now. If it is quite pale or light and you are passing quite a lot of it, you are probably well hydrated – keep up the good work. In young children, counting the number of wet nappies and making a mental note of how wet they are (ie heavy and full vs only just damp) is a useful guide. If the number or wetness of the nappies has dropped by about half, you should probably get some medical advice (as well as giving your child a drink now).

Could it be COVID-19?

Of course, the other 'first thing' to consider these days would be: could this be COVID-19? Even if your symptoms are mild, please review the advice on [this NHS page](#)⁶ to see if testing or further action is appropriate. Please note also that lateral flow tests are not as reliable when used in someone who has any symptoms, including fever. If testing is appropriate, ideally it should be with a PCR test.

When should we be worried about a high temperature?

Alongside this, other symptoms that should prompt urgent medical attention in someone who has a fever would include:

- Feeling lethargic, lightheaded or confused (or in children, a lack of interest in their toys, or difficulty waking them from sleep)
- Feeling more short of breath than normal
- A rash that doesn't fade when applying pressure (the 'glass test')
- Fever in combination with a headache and any of the following: visual disturbances, vomiting, neck stiffness, or difficulty tolerating bright lights
- Being dehydrated (a sign of this is dark urine or knowing you've not drunk enough or fewer wet nappies in young children)
- Looking very pale, or skin looking mottled or blue
- Fever lasting 5 days or longer
- Having that gut feeling that something is not right

Depending on which symptoms are present, it would be appropriate to reach out to your NHS GP or 111, or even to ring 999 for the more severe symptoms (eg new rash that doesn't fade, severe headache, severe breathing difficulties or extreme drowsiness). For further information, see the [NHS page on advice for fever in children](#)⁴ or [in adults](#)⁵. Of course, even in the absence of a fever, if you are concerned that you or your child are unwell, don't let the absence of a raised temperature stop you from seeking appropriate medical advice.

Should we treat a high temperature?

Otherwise, assuming the person with the high temperature is not seriously unwell, the next question would be "Do I treat the fever?". The reason it's worth asking this is that not every fever *needs* treatment. As described earlier, a fever can sometimes help our body be more effective at fighting the infection, and our body generally can do a good job of preventing itself from getting dangerously hot. At one point, we thought that excessive use of anti-fever medication in children could even make it take longer for them

to get over mild viral illnesses. However, a fairly comprehensive analysis of five different studies has cast doubt on this theory⁸.

Regardless, a fever in itself isn't dangerous and only really needs treating if it is making someone feel miserable or unwell⁹. If an otherwise healthy child has a fever but is drinking well with a good appetite and running around happily causing playful chaos, chances are they won't need Calpol. On the flip side, if they are clearly feeling rotten despite only having a low grade temperature, some Calpol might be helpful (as well as reviewing whether or not they need medical attention as described above). Doctors sometimes use the term 'treat the patient, not the numbers'. Giving extra fluids and drinks also can help them feel better, help their bodies fight the infection and avoid some of the damage that can come from dehydration from an illness.

How do we treat a high temperature?

If we do decide to treat a fever, the best way is through using medication. We used to advise removing clothing or sponging with cool water and sitting in front of a fan but these steps can actually make things worse. If you remember my explanation at the beginning of what happens if we go out without a coat, a similar thing happens with these measures: our body responds to the cool temperatures on our skin from the fan/sponge/lack of clothing by narrowing the superficial blood vessels and diverting our warm blood towards our already-warm centre. In terms of environmental changes that *can* be helpful, the main things are avoiding extremes of heat, ie avoid over-bundling in extra layers and blankets, if the room is hot, cool it down to a normal temperature by opening a window.

Usually the first fever-reducing medication we turn to is paracetamol (Calpol). This tends to be very safe and doesn't usually cause significant side effects. Another option of a fever-reducing medication is ibuprofen (Nurofen). This has more potential side effects and risks. It shouldn't be used in anyone with a history of asthma or serious stomach irritation as it can cause flare-ups. It also should be avoided for people with kidney damage as it can aggravate this. Besides this, there are also certain conditions, such as chicken pox, where it is strongly advised to avoid ibuprofen and related medications (eg aspirin) as it can cause life-threatening bacterial skin infections. If medication is used, it is important to

follow the dosage advice that comes with it, and to read the information leaflet and/or speak to your pharmacist or GP if you have any concerns.

Why check our temperature?

Given all I've written about how helpful fevers are, it is probably worth addressing why we'd want to check our temperature. Of course, there are multiple possible reasons for this:

- It can be particularly useful when looking after someone else who may not be able to describe how they are feeling. Especially babies, children or others with communication difficulties. Detecting a raised temperature can help shape the picture of how concerned we need to be and what our next actions should be.
- It can help us keep track of how long a fever is lasting. In children, a fever lasting 5 days is concerning and should prompt medical attention.
- It can also help us track if a fever seems to be improving or getting worse with time.
- It can be a sign of COVID-19, as discussed above.
- It can be helpful when speaking to a healthcare professional remotely if you can tell them what your temperature reading is.
- It can be useful in other circumstances as well eg patients having chemotherapy will be alerted to a possible medical emergency if they have a temperature of 38°C or higher, and women wanting to track their menstrual/ovulation cycles will find regular temperature recordings helpful.

Which thermometer should we use?

Ideally one that is clinically validated as accurate, and easy for you to use. Kinetik has some great, affordable options including a recipient of the Which? Best Buy award.

References

1. Small PM, Täuber MG, Hackbarth CJ, Sande MA. Influence of body temperature on bacterial growth rates in experimental pneumococcal meningitis in rabbits. *Infect Immun*. 1986 May;52(2):484-7. doi: 10.1128/iai.52.2.484-487.1986. PMID: 3699893; PMCID: PMC261024. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC261024/>
2. Rice P, Martin E, He JR, Frank M, DeTolla L, Hester L, O'Neill T, Manka C, Benjamin I, Nagarsekar A, Singh I, Hasday JD. Febrile-range hyperthermia augments neutrophil accumulation and enhances lung injury in experimental gram-negative bacterial pneumonia. *J Immunol*. 2005 Mar 15;174(6):3676-85. doi: 10.4049/jimmunol.174.6.3676. PMID: 15749906. <https://www.jimmunol.org/content/174/6/3676.long>
3. National Institute for Health and Care Excellence: Traffic light system for identifying risk of serious illness. <https://www.nice.org.uk/guidance/ng143/resources/support-for-education-and-learning-educational-resource-traffic-light-table-pdf-6960664333>
4. <https://www.nhs.uk/conditions/fever-in-children/>
5. Dean C. Norman, Fever in the Elderly, *Clinical Infectious Diseases*, Volume 31, Issue 1, July 2000, Pages 148-151, <https://doi.org/10.1086/313896>
6. <https://www.nhs.uk/conditions/coronavirus-covid-19/symptoms/main-symptoms/>
7. <https://www.nhs.uk/conditions/fever-in-adults/>
8. Purssell E, While AE. Does the use of antipyretics in children who have acute infections prolong febrile illness? A systematic review and meta-analysis. *J Pediatr*. 2013 Sep;163(3):822-7.e1-2. doi: 10.1016/j.jpeds.2013.03.069. Epub 2013 May 8. PMID: 23664629. <https://pubmed.ncbi.nlm.nih.gov/23664629/>

9. Barbi E, Marzuillo P, Neri E, Naviglio S, Krauss BS. Fever in Children: Pearls and Pitfalls. *Children (Basel)*. 2017 Sep 1;4(9):81. doi: 10.3390/children4090081. PMID: 28862659; PMCID: PMC5615271. <https://pubmed.ncbi.nlm.nih.gov/28862659/>