TEST

Temperature measurement

Temperature measurement uses a thermometer to check how warm your body is.

WHAT IT MEASURES
Body temperature at a particular measurement site

SAMPLE
None; a sensor detects body heat

FASTING NEEDED?
No

HOW LONG IT TAKES
A few seconds to several minutes

RESULTS IN
Immediate; no laboratory is usually involved

USED FOR
Assessing and monitoring fever, hypothermia, or temperature changes

MAIN LIMITATION
Site, device, and technique can change the reading

Overview

Temperature measurement checks how warm your body is at a particular time. It is usually done with a digital or infrared thermometer.

Body temperature is not identical throughout the body. A reading from the mouth, armpit, ear, forehead, or rectum may differ because each site estimates the body's internal, or "core," temperature differently. For this reason, record where and how the measurement was taken.

Temperature also changes naturally during the day. A single reading should be interpreted alongside your symptoms, age, medicines, recent activity, and usual temperature.

Common methods include:

Hospitals may use more direct ways to monitor core temperature during surgery or critical illness.

- Oral: the thermometer is placed under the tongue
- Axillary: the thermometer is held in the armpit
- Tympanic: an infrared sensor measures heat inside the ear

- Temporal artery: a sensor measures heat from the forehead
- Rectal: the thermometer is inserted gently into the rectum

Why the test is ordered

Temperature is measured when an infection, heat-related illness, hypothermia, or another cause of temperature change is possible. It may be one part of an assessment for symptoms such as chills, sweating, weakness, confusion, or feeling unusually hot or cold.

Healthcare teams also use temperature measurement to:

A temperature result cannot identify the cause of a fever or low temperature by itself. Other information or tests may be needed.

- Monitor an illness or response to treatment
- Check for temperature changes after surgery or a procedure
- Observe people receiving medicines that affect immunity
- Monitor newborns and people who cannot describe their symptoms
- Assess possible heat exposure or prolonged cold exposure

Who should have the test

You can check your temperature if you feel feverish, chilled, unusually hot, or generally unwell. Measuring it may also be useful when a healthcare professional has asked you to monitor an illness at home.

A reading is particularly important when a baby, an older or frail person, or someone with a weakened immune system seems unwell. These groups may not develop a typical fever even during a significant infection.

A baby younger than 3 months with a temperature of 38°C or higher needs urgent medical assessment. Follow local advice about the preferred measurement method for young babies.

Routine temperature checks are not always necessary when you feel well. Screening can miss illness because some conditions do not cause fever, and fever-reducing medicines may lower the reading.

How to prepare

You do not need to fast.

Read the thermometer instructions before use. Make sure it is clean, has working batteries, and is set to the intended unit, usually Celsius or Fahrenheit.

Before an oral measurement, avoid hot or cold drinks, food, smoking, or vaping for about 30 minutes. These can temporarily change the temperature inside your mouth.

If possible, rest indoors before measuring. Recent exercise, a hot bath, heavy clothing, or moving between very hot and cold places can affect the reading.

Use the same site and device when following a temperature over time. This makes changes easier to interpret. Do not use an oral thermometer immediately after it has been used rectally, even after cleaning.

What happens during the test

For an oral reading, place the thermometer tip under your tongue toward the back of your mouth. Close your lips around it and breathe through your nose until it signals that the measurement is complete.

For an armpit reading, place the tip against dry skin in the centre of the armpit. Hold your arm firmly against your body.

An ear thermometer is placed gently at the entrance to the ear canal. Correct position matters because poor alignment may measure the ear canal rather than heat from the eardrum.

A forehead thermometer is moved across the skin or held at the distance stated in its instructions. Sweat, hats, hair, direct sunlight, and room temperature may affect the result.

Rectal measurement is sometimes used for babies or when a closer estimate of core temperature is needed. Use a thermometer designed for this purpose and follow professional or manufacturer instructions. Never force it.

Clean the device as directed after use.

Understanding your results

There is no single temperature that is normal for everyone at every time of day. Many clinicians use 38°C or higher as a practical definition of fever, but the measurement site, device, age, and clinical situation matter.

A result below 38°C does not always rule out infection. Your temperature may be naturally lower, may be falling after medicine, or may have been measured at a site that tends to give

lower readings.

A temperature below 35°C is generally considered hypothermia and requires urgent medical attention, particularly if there is shivering, drowsiness, confusion, slow breathing, or recent cold exposure.

Do not add or subtract a fixed number to convert an armpit, mouth, ear, forehead, or rectal result. Differences between sites are not consistent enough for a universal conversion.

Reference ranges and interpretation vary by healthcare service or laboratory, device, age, sex, pregnancy status, medicines, and clinical context. The pattern over time and how you feel may be as important as one number.

What affects the results

A reading can be misleading even when the thermometer is working correctly.

Important influences include:

Recent surgery, anaesthesia, blood transfusion, or treatment that changes immune function may also affect the clinical meaning of a result, although a transfusion does not usually interfere directly with the thermometer.

- Measurement site: armpit readings often differ from oral or rectal readings
- Positioning: poor contact or incorrect ear alignment can give a low result
- Recent food or drink: hot or cold items affect oral measurements
- Exercise: physical activity temporarily raises temperature
- Environment: sunlight, cold air, heating, and heavy clothing affect skin readings
- Time of day: temperature is usually lower early and higher later
- Sweat or wet skin: this can interfere with forehead or armpit readings
- Ear conditions: earwax or an unusual ear canal shape may affect ear readings
- Medicines: paracetamol, ibuprofen, steroids like prednisone or hydrocortisone , and some other medicines may lower fever or change the response to infection
- Hormonal changes: the menstrual cycle and pregnancy can slightly change usual temperature
- Age and frailty: older adults may have a lower baseline temperature or a smaller rise during illness

Accuracy and limitations

No home thermometer gives a perfect measurement of core temperature. Accuracy depends on the device, site, positioning, and surrounding conditions.

A thermometer can miss a fever by giving a falsely low reading. This may happen with poor armpit contact, incorrect ear positioning, a sweaty forehead, recent fever-reducing medicine, or measuring soon after entering a cold room.

It can also suggest fever when core temperature is not raised. Recent exercise, a hot bath, heavy clothing, direct sunlight, or a warm drink before an oral reading can cause this.

Rectal measurements often estimate core temperature more closely than skin or armpit measurements, but they are more intrusive and may not be suitable in every situation. Oral measurement can work well for cooperative older children and adults. Ear and forehead devices are quick, but technique and environmental conditions matter.

Forehead strip thermometers are less reliable for deciding whether fever is present. Non-contact infrared devices can be useful when used correctly, but distance, angle, cleanliness, and room conditions affect them.

If a result seems inconsistent with how you feel, rest, check the instructions, and repeat it. Use a different appropriate method or seek clinical assessment if the uncertainty matters.

Risks and complications

Most temperature measurements are painless and have no significant risk. Oral, armpit, ear, and forehead devices may cause brief discomfort but do not break the skin.

Rectal measurement can cause distress and, rarely, injury if the thermometer is inserted too far or forced. Stop if there is resistance or pain.

Do not use old glass mercury thermometers. Broken devices can release mercury, which is toxic.

What happens next

For a mild fever without concerning symptoms, routine next steps may include rest, fluids, and monitoring how you feel. Repeat measurements using the same device and site if you need to follow the trend.

Seek urgent medical advice for a baby younger than 3 months with a temperature of 38°C or

higher, or if you have a weakened immune system and develop a fever or feel significantly unwell. You should also seek advice for a fever that persists, returns repeatedly, or occurs with worsening symptoms.

Call emergency services for severe breathing difficulty, marked confusion, difficulty waking, a seizure, blue or grey skin, a stiff neck with severe illness, or a rash that does not fade when pressed. A very high temperature with altered mental state after heat exposure may indicate heatstroke and is also an emergency.

A temperature below 35°C, especially after cold exposure or with drowsiness, confusion, or slow breathing, needs urgent medical care.

Common questions

Can I drink coffee before taking my temperature?

Coffee can affect an oral reading, particularly when it is hot. Wait about 30 minutes after drinking it, or use another suitable measurement site.

Does the time of day matter?

Yes. Body temperature is commonly lower in the early morning and higher in the late afternoon or evening. Compare readings taken at similar times when monitoring a pattern.

Can I exercise beforehand?

Exercise can temporarily raise your temperature. Rest and cool down before measuring if you want a baseline reading.

Which measurement site is best?

The best site depends on age, cooperation, the device, and why temperature is being checked. Consistent technique is important. Follow local advice for babies and the manufacturer's instructions for your thermometer.

Should I add a degree to an armpit reading?

No. There is no reliable fixed conversion between measurement sites. Report the actual number and where it was measured.

Can fever medicine hide a fever?

Yes. Medicines such as paracetamol or ibuprofen can lower temperature. Record when you took the medicine and do not rely on the number alone if you feel seriously unwell.

Sources

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