




## General Guidelines on measuring body temperature and using thermometer

1. Compare the accuracy, suitability, convenience and price of thermometers before purchase.
2. Choose a thermometer and method of measurement which suit the individual's age and health condition; Consult healthcare professionals if in doubt.
3. Patients with communicable diseases should use personal thermometers to avoid cross-infection.
4. Familiarise with the correct use of thermometer and temperature reading by referring to the user instructions provided by manufacturer.
5. Avoid activities that would distort temperature measurement (e.g. drinking hot water immediately before taking oral temperature).
6. Clean and maintain the thermometer according to the procedures recommended by the user instructions.
7. In case body temperature needs to be taken regularly, take the temperature at the same time of each day and use the same temperature taking method to allow comparison.
8. If there is any doubt about the body temperature reading, please consult healthcare professionals.



## Types of thermometer and specific precautions

Description	Special points to note*
<b><u>Mercury-in-glass/ Alcohol-in-glass Thermometer</u></b>	
<p>Measures oral, rectal or armpit body temperature through the thermal expansion of mercury/ ethanol</p> <p>Oral </p> <p>Rectal </p>	<p>As mercury spill is hazardous to environment and health, the use of mercury thermometer should be avoided as far as possible.</p> <p>Thermometer should be reset by shaking the mercury/ ethanol level down below 35°C (95°F) each time before using.</p> <p>The tips of oral thermometer and rectal thermometer are different in shape (slender vs. round) and must not be cross-used.</p>
<b><u>Electronic (digital) Thermometer</u></b>	
<p>Measures oral, rectal or armpit body temperature by means of thermistor with its resistance varying according to the temperature</p> <p></p>	<p>Temperature difference among oral, rectal and armpit body temperature should be noted.</p>
<b><u>Infrared Thermometer</u></b>	
<p>Measures thermal radiation (infrared) emitted from ear and forehead to infer body temperature</p>	<p>For ear thermometer, a new ear-probe jacket should be used for different person; the ear canal must be pulled straight when measuring.</p> <p>Forehead thermometer should only be used for screening instead of diagnostic purpose due to greater measurement error.</p>

\* Users should read and follow the instructions in the user manual of the thermometer because operation procedures may vary among brands



## Proper use of thermometers to measure body temperature



[www.mdco.gov.hk](http://www.mdco.gov.hk)

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Department of Health

Thermometer can be used to check the body temperature to see whether a person has a fever. This pamphlet provides an introduction to body temperature, its measurement methods and proper use of various types of thermometer.



## Body Temperature

There are two ways to measure body temperature — by measuring core temperature and surface temperature.

Body temperature measurement	Meaning	Measurement taken through
Core temperature	Temperature of deep tissues	Oral cavity, ear canal, rectum
Surface temperature	Temperature of surface skin tissues	Forehead, armpit

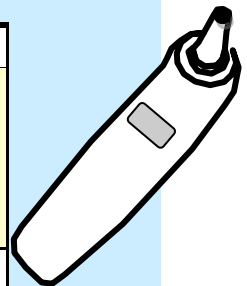
Since surface temperature is more susceptible to changes in the surroundings, it is considered less accurate and is recommended for use only when there is difficulty in measuring the core temperature.

## Comparison among different measurement methods

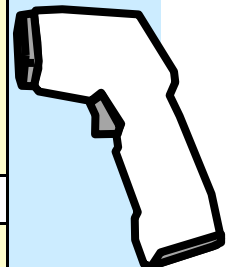
Measurement method	Oral	Ear	Rectal	Forehead	Armpit
<b>Suitability</b>					
<b>Infants and children below 6</b>		✓	✓	✓	✓
<b>Adults and children above 6</b>	Cooperative	✓	✓	✓	✓
	Uncooperative		✓	✓	
	Unconscious		✓	✓	✓
<b>Accuracy</b>	😊😊😊	😊😊😊	😊😊😊	😊	😊😊
<b>Convenience and speed</b>	😊😊😊	😊😊😊	😊	😊😊😊😊	😊😊
<b>Reference level for fever</b>	> 37.5°C (99.5°F)	> 38°C (100.4°F)	> 38°C (100.4°F)	> 36°C (96.8°F)	> 37.3°C (99.1°F)

## Measurement methods and specific precautions

Measurement method	Unsuitable conditions for the measurement method
Oral	<ul style="list-style-type: none"> <li>● Suffering from shortness of breath</li> <li>● Sneezing repeatedly, having a hard cough or suffering a seizure</li> <li>● Unconscious or confused</li> <li>● Unable to close the mouth tightly</li> </ul>
Ear	<ul style="list-style-type: none"> <li>● Having a middle ear infection</li> <li>● Obstruction of ear canal by ear wax</li> <li>● Wearing hearing aid</li> </ul>
Rectal	<ul style="list-style-type: none"> <li>● Large amount of faeces accumulated in the rectum</li> <li>● Rectal diseases, e.g. haemorrhoid or diarrhoea, etc.</li> <li>● Just undergone intestinal operation</li> <li>● Having wounds/ lesions in the anus</li> </ul>
Armpit	<ul style="list-style-type: none"> <li>● Unable to secure thermometer under the axilla</li> </ul>
Forehead	<ul style="list-style-type: none"> <li>● Forehead being covered (e.g. by bandage/ cooling gel sheet)</li> </ul>



Infrared ear thermometer



Infrared forehead thermometer