**HOW TO CHECK FOR THE FOLLOWING CARDINAL SIGNS AND THEIR RANGES IN ADULT AND CHILDREN**

TEMPERATURE

PULSE RATE

RESPIRATORY RATE

BLOOD PRESSURE

**TEMPERATURE**

The temperature is the measure of the degree of coldness or hotness of the body,

Human body is modulated into a fine tune with a perfect regulation of external factors such temperature, pressure, concentration of liquids and macromolecules.

Due to molecular nature of the body, the temperature variation is a key factor to be considered, and with all the prolific adherence of the body’s corrective mechanism through the feedback loops,

Adverse temperature changes induce adverse effects to proteinous compounds and even to the molecular structures.

**THE NORMAL RANGE OF TEMPERATURE IN ADULTS AND CHILDREN**

A particular set point is conformed to apply to be a normal range of temperature in children and adults, these ranges are significant in spotting deteriorations, such as pathological effects, diseases, and new infestation, some infections are pre-signaled by an abnormal rise or fall in temperature.

In adults, the average change in temperature is depicted as from 35.8 to 37.0 degree Celsius, any temperature rise above 38 degrees is regarded to be fever condition

In children, a temperature range 97.9°F (36.6°C) to 99°F (37.2°C) is regarded to be a normal to babies and children,

These ranges in temperature are considered friendly and in a normal physiological apex

**HOW TO CHECK FOR TEMPERATURE**,

There are several areas used in determining an individual’s temperature, right from the most effective regions to the least,

The following are the various region where temperature can be determined by

1. **MOUTH REGION**
2. **AXILLARY REGION**
3. **SKIN**
4. **RECTAL**

***Procedure for determining temperature by MOUTH***

You can use either digital thermometer or glass thermometer commonly referred to as clinical thermometer,

While using the glass thermometer,

* Introduce yourself to the patient, and explain the procedure to the patient
* Create a scene where the procedure is to take place
* With the current readings in considerations, instantly any temperature Above 98 F before the reading is taken, shake well the thermometer to restore it
* Clean and disinfect the thermometer using alcohol
* Put the thermometer into a covering top, usually made of a polythene and insert it inside the patient’s mouth,
* Wait for 2-3 minutes and remove the thermometer from the mouth,
* Remove the covering top and read the new readings
* Document your findings

***Procedure for determining temperature by AXILLARY REGION***

While using the glass thermometer

* Introduce yourself to the patient, and explain the procedure to the patient
* Create a scene where the procedure is to take place
* With the current readings in considerations, instantly any temperature Above 98 F before the reading is taken, shake well the thermometer to restore it
* Clean and disinfect the thermometer using alcohol
* Put the thermometer under the patient’s armpits and close the armpits
* Wait for 2-3 minutes and remove the thermometer from the patients armpits
* Remove the covering top and read the new readings
* Document your findings

***Procedure for determining the body temperature by SKIN***

With the use of a TEMPERAL THERMOMETER/ OR BODY SCANNER/ OR GUN THERMOMETER

* Introduce yourself to the patient, and explain the procedure to the patient
* Create a scene where the procedure is to take place
* With the patients head in a upright position,
* Drug the thermometer, along the frontal lobe towards the temporal lobe, until it reaches next to your ears
* Wait for 2-3 minutes and remove the thermometer
* Document your findings

***Procedure for determining temperature by RECTAL***

While using the glass thermometer/digital thermometer

* Introduce yourself to the patient, and explain the procedure to the patient
* Create a scene where the procedure is to take place
* Put on the gloves,
* Clean the thermometer using the alcohol agent
* Insert the thermometer into the top cover
* Lubricate the thermometer in the top cover,
* Ensure the patient is lying down with the front facing down, and the knees slightly bent
* Insert the thermometer through the rectum to at least 1.0 inch
* Wait for 2-3 minutes until the digital thermometer beeps and remove the thermometer from the rectum,
* Remove the covering top and read the new readings
* Document your findings

**PULSE RATE**

The **pulse rate** is a measurement of the heart **rate**, or the number of times the heart beats per minute. As the heart pushes blood through the arteries, the arteries expand and contract with the flow of the blood. Taking a **pulse** not only measures the heart **rate**, but also can indicate the following: Heart rhythm. Strength of the pulse.

**Pulse rate range**

The normal pulse for healthy adults ranges from 60 to 100 beats per minute. The pulse rate may fluctuate and increase with exercise, illness, injury, and emotions. Females ages 12 and older, in general, tend to have faster heart rates than do males. Athletes, such as runners, who do a lot of cardiovascular conditioning, may have heart rates near 40 beats per minute and experience no problems

How to check your pulse

As the heart forces blood through the arteries, you feel the beats by firmly pressing on the arteries, which are located close to the surface of the skin at certain points of the body. The pulse can be found on the side of the neck, on the inside of the elbow, or at the wrist. For most people, it is easiest to take the pulse at the wrist. If you use the lower neck, be sure not to press too hard, and never press on the pulses on both sides of the lower neck at the same time to prevent blocking blood flow to the brain. When taking your pulse:

* Using the first and second fingertips, press firmly but gently on the arteries until you feel a pulse.
* Begin counting the pulse when the clock's second hand is on the 12.
* Count your pulse for 60 seconds (or for 15 seconds and then multiply by four to calculate beats per minute).
* When counting, do not watch the clock continuously, but concentrate on the beats of the pulse.
* If unsure about your results, ask another person to count for you.

If your doctor has ordered you to check your own pulse and you are having difficulty finding it, consult your doctor or nurse for additional instruction.

## Respiration rate

The respiration rate is the number of breaths a person takes per minute. The rate is usually measured when a person is at rest and simply involves counting the number of breaths for one minute by counting how many times the chest rises. Respiration rates may increase with fever, illness, and other medical conditions. When checking respiration, it is important to also note whether a person has any difficulty breathing.

Normal respiration rates for an adult person at rest range from **12 to 16** breaths per minute.

## Blood pressure

Blood pressure is the force of the blood pushing against the artery walls during contraction and relaxation of the heart. Each time the heart beats, it pumps blood into the arteries, resulting in the highest blood pressure as the heart contracts. When the heart relaxes, the blood pressure falls.

Two numbers are recorded when measuring blood pressure. The higher number, or systolic pressure, refers to the pressure inside the artery when the heart contracts and pumps blood through the body. The lower number, or diastolic pressure, refers to the pressure inside the artery when the heart is at rest and is filling with blood. Both the systolic and diastolic pressures are recorded as "mm Hg" (millimeters of mercury). This recording represents how high the mercury column in an old-fashioned manual blood pressure device (called a mercury manometer or sphygmomanometer) is raised by the pressure of the blood. Today, your doctor's office is more likely to use a simple dial for this measurement.

[High blood pressure](https://www.hopkinsmedicine.org/healthlibrary/conditions/adult/cardiovascular_diseases/high_blood_pressure_hypertension_85%2CP00224), or hypertension, directly increases the risk of heart attack, heart failure, and stroke. With high blood pressure, the arteries may have an increased resistance against the flow of blood, causing the heart to pump harder to circulate the blood.

Blood pressure is categorized as normal, elevated, or stage 1 or stage 2 high blood pressure:

* **Normal** blood pressure is systolic of less than 120 and diastolic of less than 80 (120/80)
* **Elevated** blood pressure is systolic of 120 to 129 **and** diastolic less than 80
* **Stage 1** high blood pressure is systolic is 130 to 139 **or** diastolic between 80 to 89
* **Stage 2** high blood pressure is when systolic is 140 or higher **or** the diastolic is 90 or higher

These numbers should be used as a guide only. A single blood pressure measurement that is higher than normal is not necessarily an indication of a problem. Your doctor will want to see multiple blood pressure measurements over several days or weeks before making a diagnosis of high blood pressure and starting treatment. Ask your provider when to contact him or her if your blood pressure readings are not within the normal range.

## Why should I monitor my blood pressure at home?

For people with hypertension, home monitoring allows your doctor to monitor how much your blood pressure changes during the day, and from day to day. This may also help your doctor determine how effectively your blood pressure medication is working.

## What special equipment is needed to measure blood pressure?

Either an aneroid monitor, which has a dial gauge and is read by looking at a pointer, or a digital monitor, in which the blood pressure reading flashes on a small screen, can be used to measure blood pressure.

## About the aneroid monitor

The aneroid monitor is less expensive than the digital monitor. The cuff is inflated by hand by squeezing a rubber bulb. Some units even have a special feature to make it easier to put the cuff on with one hand. However, the unit can be easily damaged and become less accurate. Because the person using it must listen for heartbeats with the stethoscope, it may not be appropriate for the hearing-impaired.

## About the digital monitor

The digital monitor is automatic, with the measurements appearing on a small screen. Because the recordings are easy to read, this is the most popular blood pressure measuring device. It is also easier to use than the aneroid unit, and since there is no need to listen to heartbeats through the stethoscope, this is a good device for hearing-impaired patients. One disadvantage is that body movement or an irregular heart rate can change the accuracy. These units are also more expensive than the aneroid monitors.

## About finger and wrist blood pressure monitors

Tests have shown that finger and/or wrist blood pressure devices are not as accurate in measuring blood pressure as other types of monitors. In addition, they are more expensive than other monitors.

## Before you measure your blood pressure:

* Don't smoke or drink coffee for 30 minutes before taking your blood pressure.
* Go to the bathroom before the test.
* Relax for 5 minutes before taking the measurement.
* Sit with your back supported (don't sit on a couch or soft chair). Keep your feet on the floor uncrossed. Place your arm on a solid flat surface (like a table) with the upper part of the arm at heart level. Place the middle of the cuff directly above the bend of the elbow. Check the monitor's instruction manual for an illustration.
* Take multiple readings. When you measure, take 2 to 3 readings one minute apart and record all the results.
* Take your blood pressure at the same time every day, or as your healthcare provider recommends.
* Record the date, time, and blood pressure reading.
* Take the record with you to your next medical appointment. If your blood pressure monitor has a built-in memory, simply take the monitor with you to your next appointment.
* Call your provider if you have several high readings. Don't be frightened by a single high blood pressure reading, but if you get several high readings, check in with your healthcare provider.
* When blood pressure reaches a systolic (top number) of 180 or higher OR diastolic (bottom number) of 110 or higher, seek emergency medical treatment.

Ask your doctor or another healthcare professional to teach you how to use your blood pressure monitor correctly. Have the monitor routinely checked for accuracy by taking it with you to your doctor's office. It is also important to make sure the tubing is not twisted when you store it and keep it away from heat to prevent cracks and leaks.

Proper use of your blood pressure monitor will help you and your doctor in monitoring your blood pressure.

**HOW TO CHECK FOR THE FOLLOWING CARDINAL SIGNS AND THEIR RANGES IN CHILDREN**

1. Weight
2. Head circumference
3. Mid upper arm circumference
4. Length/height

**Weight**

Most widely used and simplest, reproducible anthropometric measurements for the evaluation of nutritional status.

* It indicates body mass
* It is sensitive to even small changes in nutritional status due to childhood morbidity like diarrhea.
* Rapid loss of weight indicates a potential malnutrition
* Serial weight recording is more valuable for progressive growth of a child when age of a child is not known.

**Technique for measurement**

To measure weight beam or lever accentuated scales with an accuracy of 50-100 g are preferred. Portable Salter scale (CMS Weighing Equipment, Ltd. England): the child is suspended from the scale which is hung from a branch or a tripod. Special "pants" are used to weigh babies. Robust, cheap, and easy to carry, these scales should be replaced after one year because of stretching of the spring and inaccurate readings. The model with readings up to 25 kg (x 100 g) is recommended.

Bathroom scales are not recommended as errors up to 1.5 kgs can occur with this.

**Precautions to be taken while weighing**

* Zero error has to be adjusted.
* Minimal clothing should be worn and be without shoes.
* While recording the value do not lean against or hold anything.
* Preferably record under basal conditions in early morning.
* Most types of scales (especially beam scales) are sensitive to dust and mud.

**Standards**

* On an average, a baby weighs double the birth weight by five months, trebles its birth weight by one year and quadruples its birth weight by two years.
* A baby should gain at least 500g per month in the first three months of life. If the growth is less than this it points to malnutrition. In different parts, the average birth weight is between 2.5 to 2.9 kgs.
* Weight for age is used to classify malnutrition.

**Head and Chest circumference**

* Head size relates to the size of the brain which increases rapidly during infancy.
* In a normally nourished child, chest grows faster than the head circumference during second and third years.

**Technique**

* Use a fibre glass tape.
* Head circumference is recorded by passing the tape around the head over the supraorbital ridges of frontal bone in front and the most protruding point of occiput on the back of the head.
* Chest circumference is measured at the level of nipple in mid inspiration.

**Standards**

* At birth head circumference is 34 cm and chest circumference is 32 cm.
* By 6-9 months both become equal.
* In PEM, due to poor growth of chest, the head circumference may remain to be higher than the chest even at the age of 2.5 to 3 years due to poor development of thoracic cage.
* Both the measurements are not useful beyond the preschool age.

**Mid upper arm circumference**

* Mid upper arm circumference and calf circumference indicate the status of muscle development. Mid calf and mid upper arm are heavily muscled and is approximately circular.
* Mid upper arm circumference is simple, easily accessible in any age and sex and practical to measure.
* Well-nourished children have a nearly constant arm circumference (about 16 cm) between 1 and 5 years. Undernourished children have a thinner upper arm and a smaller AC.
* Children can be classified as malnourished if their AC falls below an arbitrarily specified level. If ages are not known, AC can be related to height (arm circumference or height).
* As poor musculature and wasting are cardinal features of PEM in early childhood, MUAC helps in identifying malnutrition and in determining mortality risk in children. It correlates well with weight, weight for height and clinical signs.( QUAC stick).

**Technique**

* Usually left arm is measured. Arm is flexed at the elbow.
* The circumference is measured on the left upper arm half way between the end of the shoulder (acromion and the tip of the elbow (olecranon). To locate this point, the arm is flexed at a right angle. Then the arm is allowed to hang freely and a tape-measure (preferably of fibreglass) put firmly round it. Do not pull too tight.
* Tapes or strips can be made locally from thin cardboard or X-ray films which are marked in centimeters. Special plastic tapes (insertion tapes) have been manufactured.
* Fibre glass tape is preferred to tailors cloth tape as it is seen to lose accuracy.

**Height/length**

* Height of an individual is influenced by genetic as well as environmental factors.
* Maximum growth potential is decided by genetic factors.
* Nutrition and incidences of infection determine the extent of exploitation of that genetic potential.
* Inadequate dietary intake and/ or infections reduce nutrients available at the cellular level.This results in growth retardation. A prolonged period of severe deprivation leads to stunting.

**Technique for measurement**

* Children below two years are measured by using an infantometer.
* Baby is made to lie on the scale and crown heel length is measured.
* For children above two years and adults a vertical measuring rod anthropometer- is used and maximum height is measured.
* Measuring scale should be capable of measuring to an accuracy of 0.1 cm.

**Standards**

* Length of the baby at birth is 50 cm.
* By first year it increases by 50% to 75cm.
* By third year end it increases by 12cm.
* During puberty, growth spurt, boys add 20cm to their height and girls gain about 16 cm.
* Indian girls reach 98% of their final height by 16.5 yrs. and boys reach the same stage by 17.75 yrs.
* Low height for age indicates nutritional stunting or dwarfing. It reflects past or chronic stunting. Cut off point for diagnosis of stunting is 90% NCHS values.

**HOW TO CALCULATE FOR BODY MASS INDEX IN ADULTS AND WHAT ARE ITS RANGES.**