

VITAL SIGNS

INTRODUCTION

Vital signs (pulse, blood pressure, temperature, respiratory rate, pain) are physiological parameters that a healthcare professional requires when dealing with patients. Accurate measurement of vital signs is of prime importance in the decision-making process of diagnosis and management.

LEARNING OUTCOME

The students will be able to elicit vital signs correctly on human volunteers/patients

SKILL

Motor Skill

LEARNING OBJECTIVE

At the end of the session first year MBBS students would be able to demonstrate correct methods of eliciting vital signs on a volunteer/simulator.

PULSE

INTRODUCTION

a) DEFINITION:

It is a pressure wave generated by left ventricular contraction which propagates along the peripheral arteries. A normal adult pulse rate is 60-100 beats/ min.

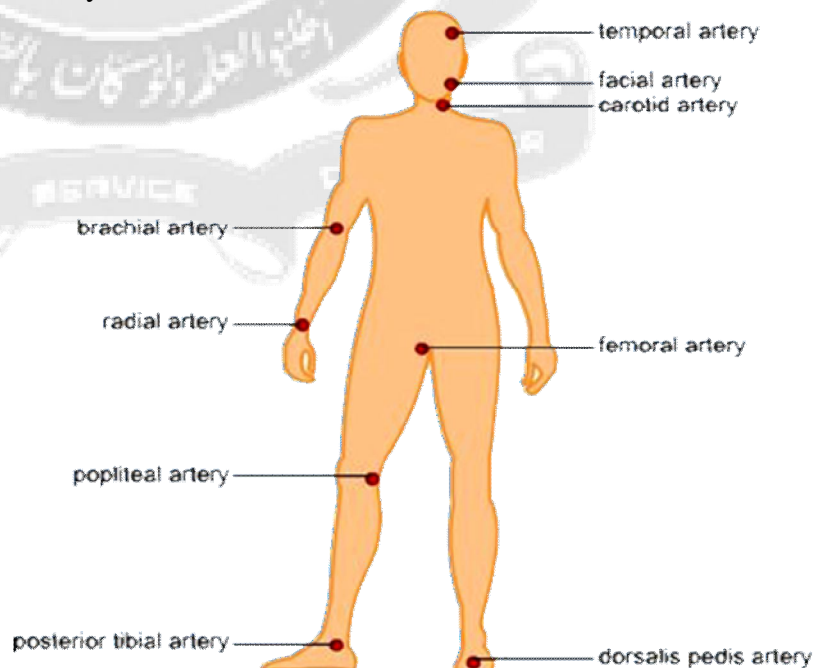
Pulse greater than 100 beats/min is called tachycardia, less than 60 called bradycardia



beats/min is

The pulses which are checked include:

- Superficial Temporal
- Brachial
- Femoral
- Posterior tibial
- Carotid
- Radial
- Popliteal
- Dorsalis pedis



FACTORS AFFECTING PULSE RATE

- Age
- Gender
- Activity level
- Temperature
- Physiological states e.g. anxiety, pregnancy etc.
- Trauma and diseases

b) NORMAL PULSE RANGE:

Age Group	Normal Range (Beats / Min)
Infant	130 – 150
Children (1 – 12 year)	90 – 110
Adult	60 – 100

RADIAL PULSE: METHOD

- Slightly pronate the patient's forearm and flex the wrist
- Place your index and middle fingers gently on the wrist, one inch from the base of the thumb (lateral to the tendon of flexor carpi radialis muscle).
- Count pulse for one minute and record the rate as beats per minute. In emergency situation, you may count pulse for half a minute and multiply it by 2.

BLOOD PRESSURE

INTRODUCTION

Blood pressure is the pressure exerted by blood on unit area of the vessel wall.

- Systolic BP: the pressure in arterial system during systole
- Diastolic BP: the pressure in arterial system during diastole

EQUIPMENT REQUIRED:

- Sphygmomanometer (mercury / aneroid)
- Stethoscope

JNC 7: Guidelines for Hypertension

Classification of Blood Pressure

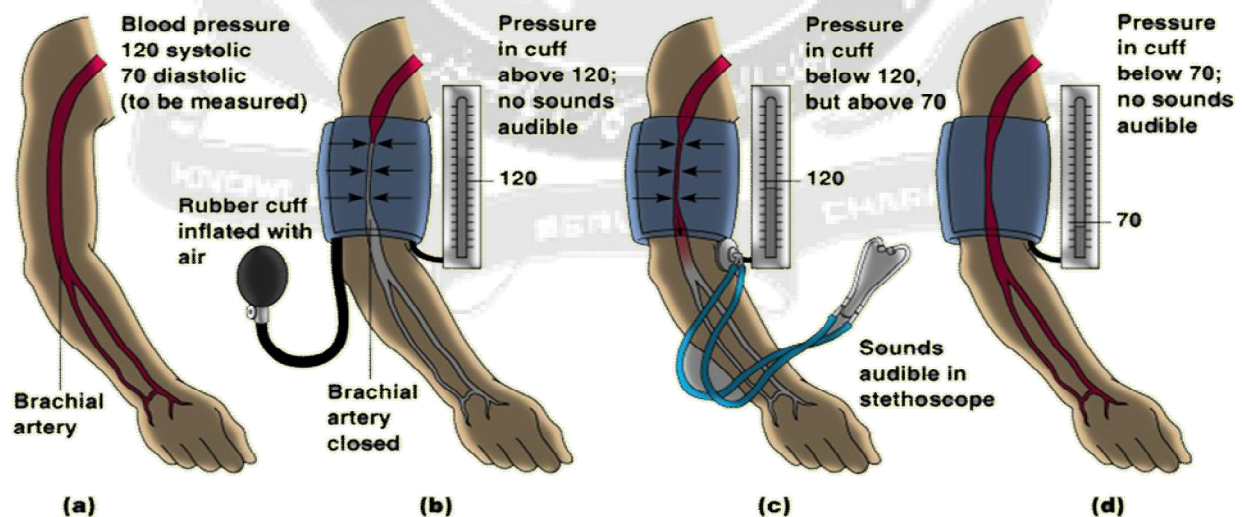
<u>Category</u>	<u>SBP (mm Hg)</u>		<u>DBP (mm Hg)</u>
Normal	<120	and	<80
Prehypertension	120-139	or	80-89
Hypertension, Stage 1	140-159	or	90-99
Hypertension, Stage 2	≥160	or	≥100



METHOD

- For most accurate measurements, it is recommended that the patient be relaxed and seated with legs uncrossed (or supine) at least five minutes before measurement of the blood pressure
- Select appropriate size of cuff (the bladder of the cuff should be approx. 80 per cent of the patient's arm circumference; ideal width of the cuff is 40 per cent of upper arm's circumference)
- Position patient's arm at the level of heart. The dial of the sphygmomanometer should be at the eye level of the examiner
- Expose the upper arm up to the shoulder.
- Completely remove air from the cuff and apply it snugly around patient's upper arm. The lower edge of the cuff should be one inch above the cubital fossa. The tubing of the apparatus should be over the brachial artery, medial to the tendon of the biceps brachii
- Feel the radial pulse
- Inflate the cuff until the radial pulse disappears. Inflate the cuff further to 30mmHg above the pressure at which the pulse disappeared.
- Deflate the cuff slowly (approx. 2mmHg/sec)
- The pressure at which radial pulse appears is systolic pressure.
- Deflate the cuff completely. Identify the brachial artery in the cubital fossa and place the diaphragm of the stethoscope over it.
- Holding the inflation bulb in your right hand, inflate the cuff briskly to about 30mmHg above the systolic blood pressure
- Deflate the cuff slowly (approx. 2mmHg/sec)
- Note the pressure at which you hear a sound (Korotkoff's sounds). This is the systolic blood pressure.
- Continue to deflate the cuff until the sound becomes muffled. This is the diastolic blood pressure.
- Repeat the process in the other arm.

Measuring Arterial Blood Pressure



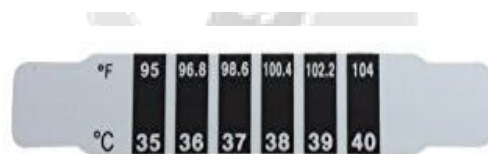
TEMPERATURE

INTRODUCTION

Normal temperature of human body is 98.6° F (37° C). Pyrexia/fever refers to elevated body temperature.

COMMON TYPES OF THERMOMETERS

- Mercury thermometer
- Digital thermometer
- Forehead strip thermometer
- Infrared thermometer



COMMON SITES FOR TAKING TEMPERATURE

- Mouth
- Ear
- Axilla
- Rectum

Note:

- Rectal temperature is 0.5 F (0.3C) to 1F (0.6C) higher than oral temperature.
- Axillary temperature is 0.5 F (0.3C) to 1F (0.6C) lower than oral temperature.
- Forehead temperature is 0.5 F (0.3C) to 1F (0.6C) lower than oral temperature.

VITAL SIGNS

TEMPERATURE RANGES:

Category	° Centigrade	° Fahrenheit
Normal	36.6-37.2	98-99
Subnormal	< 36.6	< 98
Febrile	>37.2	> 99
Hyperpyrexia	>41.6	> 107
Hypothermia	< 35	< 95

EQUIPMENT REQUIRED:

- Thermometer
- Alcohol swab

METHOD

- Take a clean thermometer
- Shake the thermometer until mercury goes below the lowest reading.
- Place it under the patient's tongue and instruct him/her to close the lips and not to hold the thermometer by teeth
- Wait for one minute
- Take out the thermometer and note the mercury level on the graduated tube. This reading indicates the temperature.

CAVEAT

To avoid spread of infection, separate thermometers should be reserved for different individuals

RESPIRATORY RATE

INTRODUCTION

The respiratory rate is the rate at which breathing occurs. This is usually measured in breaths per minute and is set and controlled by the respiratory center. The respiratory rate ranges for different age groups are as follows;

Age (years)	Respiratory rate (breaths / minute)
< 1	30-40
1-2	25-35
2-5	25-30
5-12	20-25
>12	12-20

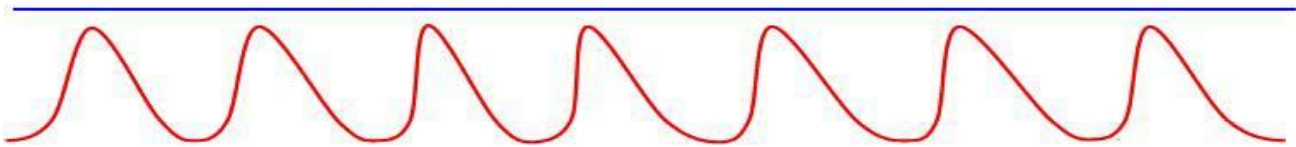
METHOD

- Ask the patient to lie down on bed comfortably
- Observe the movements of the chest or abdomen and count a cycle of expiration and inspiration as one breath

- In order to avoid the patient from becoming conscious, and to hold his/her breath, place your finger on radial pulse while observing the chest/abdomen
- Count breaths for one minute

Normal

14 - 20 respirations in 1 minute



PAIN

INTRODUCTION

Pain is a physical feeling caused by disease, injury or anything that hurts the body.

METHOD

Assessing pain is an observational skill. Usually when the patient is suffering from pain, he/she will complain of it. The skill is to quantify the pain so as to select the appropriate analgesics. There are several ways of quantifying pain.

PAIN MEASUREMENT SCALE

