Fundamentals of Nursing

Prepared by

Ramy Ramadan
Assistant Lecturer

Mosul University - Nursing College
Vital Signs
Vital signs are measures of various physiological status, often taken by health professionals, in order to assess the most basic body functions. When these values are not zero, they indicate that a person is alive.

All of these vital signs can be observed, measured, and monitored. This will enable the assessment of the level at which an individual is functioning. Normal ranges of measurements of vital signs change with age and medical condition.
The purpose of recording vital signs is to establish a **baseline** on admission to a hospital, clinic, professional office, or other encounter with a health care provider. Vital signs may be recorded by a nurse, physician, physician's assistant, or other health care professional.

The health care professional has the responsibility of interpreting data and identifying any abnormalities from a person's normal state, and of establishing if current treatment or medications are having the desired effect. Abnormalities of the heart are diagnosed by analyzing the **heartbeat** (or pulse) and blood pressure. The rate, rhythm and regularity of the beat are assessed, as well as the strength and tension of the beat, against the **arterial** wall.
Vital signs are usually recorded from once hourly to four times hourly, as required by a person's condition. The vital signs are recorded and compared with normal ranges for a person's age and medical condition. Based on these results, a decision is made regarding further actions to be taken.

All persons should be made comfortable and reassured that recording vital signs is normal part of health checks, and that it is necessary to ensure that the state of their health is being monitored correctly. Any abnormalities in vital signs should be reported to the health care professional in charge of care.
Vital Signs

- Are measurements of the body's most basic functions:
  1. Body temperature (Temp)
  2. Pulse/heart rate
  3. Respiration
  4. Blood pressure (BP)
When to Assess Vital Signs

1. Upon admission to any healthcare agency.
2. Based on agency institutional policy and procedures.
3. Any time there is a change in the patient’s condition.
4. Before and after surgical or invasive diagnostic procedures.
5. Before and after activity that may increase risk.
6. Before and after administering medications that affect cardiovascular or respiratory functioning.
Assessing Body Temperature

- The normal range of the body temperature is between 36.2-37.2°C.
Figure 27-4  ■ Terms used to describe alterations in body temperature (oral measurements) and ranges in Celsius (centigrade) and Fahrenheit scales.
Heat Production

1. Metabolic activities (primary source)
2. Exercises.
Heat Loss

1. Skin (primary site).
2. Eliminating urine and feces.
Factors Affecting Body Temperature

- **Age**: very young and very old are more sensitive to change in environmental temperature.

- **Gender**: women tend to have more function in body temperature than men the increase in progesterone secretion at ovulation increase body temperature.

- **Stress**: the body respond to both physical and emotional stress.

- **Environmental temperature**: wearing clothing allow to increase heat loss when it is hot or retain heat when it is cold.

- **Illness**.
Signs/Symptoms of Increase Body Temperature

1. Thirst.
2. Dry skin.
3. Headache.
4. Dehydration.
5. Loss of appetite.
6. Decrease in urine output.
7. Seizures in young child and infants.
Treatment Increase Body Temperature

1. Antipyretics.
2. Cold sponge bath.
3. Cold compresses.
Hypothermia

- Hypothermia: it is a body temperature below the normal limit – 35 c°.
Sites for Assessing Temperature

1. Orally (common way). 37°C (3 – 5 min)
2. Axillary (safe way). 36°C + 0.5°C (10 min)
3. Rectal (accurate reading). 37°C – 0.5°C (2 – 3 min)
4. Tympanic membrane.
When we cannot use oral thermometer?

1. The child under 6 years.
2. Unconscious patients.
3. Psychiatric patients.
4. Patient who cannot breath from his nose.
5. Mouth surgery or infection.
6. Patient on oxygen mask.
When we cannot use rectal thermometer?

1. With patients who have rectal surgery.
2. With patients who have any rectal disorders.
Thermometers

- Electronic thermometer.
- Glass thermometer.
- Paper thermometer.
- Tympanic membrane thermometer.
Figure 27-9  • An infrared (tympanic) thermometer used to measure the tympanic membrane temperature.

Figure 27-8  • A temperature-sensitive skin tape.

Figure 27-14  • Pull the pinna of the ear up and back while inserting the tympanic thermometer.

Figure 27-11  • Oral thermometer placement.
**Pulse Rate**

*Heart Beat (Pulse)*: Is the palpable bounding of blood flow noted at various points in the body. It is indicator of circulatory status.
Pulse Rate

- The normal heart rate in adult is (60 – 100 beat/min.)
- TACHYCARDIA: is a rapid pulse rate, greater than 100 beat/min.
- BRADYCARDIA: is a pulse rate below 60 beats/min. in adults.
Factors Contribute to Increase Pulse Rate

- Pain.
- Fever.
- Stress.
- Exercise.
- Bleeding.
- Decrease in blood pressure.
- Some medications as (adrenalin, aminophylline)
Factors May Slow The Pulse

- Rest.
- Increasing age.
- People with thin body size.
- Some Medications.
- Thyroid gland disturbances.
PULSE SITES

- TEMPORAL PULSE
- CAROTID PULSE
- BRACHIAL PULSE
- RADIAL PULSE
- FEMORAL PULSE
- POPLITEAL PULSE
- POSTERIOR TIBIAL PULSE
- DORSALIS PULSE
- Auscultation APICAL PULSE with stethoscope
Pulse Points and Pressure Points

- External Maxillary
- Superficial Temporal
- Carotid
- Brachial
- Ulnar
- Radial
- Femoral
- Posterior Tibial
- Popliteal
- Dorsalis Pedis
Figure 27-23  Taking an apical pulse using the flat disc of the stethoscope. Note how the amplifier is held against the chest.
Respiration

- Pulmonary ventilation (breathing): movement of air in and out of the lungs.
- Inspiration (inhalation) is the act of breathing in.
- Expiration (exhalation) is the act of breathing out.
Respiration

- Changes in response to body demands.
- Increase in carbon dioxide is the most powerful respiratory stimulant.
- Respiration involves two distinctly different processes. External respiration which is the movement of air between environment and lungs, Internal respiration that is the movement of oxygen between the hemoglobin and single cells.
Factors Affecting Respiration

- Pain.
- Anxiety.
- Exercise.
- Medications.
- Trauma.
- Infection.
- Respiratory and cardiovascular disease.
- Alteration in fluids, electrolytes, acid-base balances.
Assessing Respirations

- Inspection.
- Listening with stethoscope.
- Monitoring arterial blood gas results.
- Using a pulse oximeter.
Tachypnea is a respiration rate greater than 20 times/minute.
Bradypnea is a respiration rate less than 10 times/minute which can be seen while sleeping.
Apnea is the absence of breathing that can be for few seconds or life threatening if prolonged.
Dyspnea: is a difficult in breathing.

Assessment of respiration includes;
Depth [by assessing the degree of excursion or movement in the chest wall; shallow, deep or normal], and Rhythm.
Rate [the nurse observes a full inspiration & expiration when counting.
Respiration

**IMPORTANT NOTE:**
- Nurse must not tell the patient that he or she will assess his respiration because the patient can control his breathing so that will give a wrong assessment.
- A complete cycle of an inspiration composes one respiration.
### Patterns of Respiration

<table>
<thead>
<tr>
<th></th>
<th>Desperation</th>
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</thead>
<tbody>
<tr>
<td><strong>Normal</strong></td>
<td>12 – 20 breath / minute</td>
</tr>
<tr>
<td><strong>Tachypnea</strong></td>
<td>24b / min shallow</td>
</tr>
<tr>
<td><strong>Bradypnea</strong></td>
<td>10 b / min Regular</td>
</tr>
<tr>
<td><strong>Hyperventilation</strong></td>
<td>Increased rate and depth</td>
</tr>
<tr>
<td><strong>Hypoventilation</strong></td>
<td>Decreased rate and depth Irregular</td>
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Blood Pressure

- Blood pressure: is the force required by the heart to pump blood from the ventricles of the heart into the arteries.
- It is measured in systolic and diastolic pressure.
Blood Pressure

- Systolic: is known as the force to pump blood out of the heart.
- Diastolic: it is known as relaxation period of the heart pump (ventricles)
- Blood pressure = systolic pressure / diastolic pressure.
- The normal BP is 120/80 mmHg.
Blood Pressure

- Hypertension: it means high blood pressure.
- Factors increasing blood pressure:
  - Increasing age.
  - Obese person.
  - Emotions as anger, fear.
  - Tension.
  - Exercise.
  - Food intake.
  - Illness.
  - Medications.
Blood Pressure

- Hypotension: it means low blood pressure
- Factors that reduce blood pressure:
  - severe blood loss (bleeding)
  - burns.
  - vomiting.
  - diarrhea.
  - medications
Equipment for Assessing Blood Pressure

- Stethoscope and sphygmomanometer.
- Electronic or digital devices.
Figure 27-29: Automatic blood pressure monitors register systolic, diastolic, and mean blood pressures.