Vital Signs

- They are called vital signs because they are important.
- They include:
  - Temperature
  - Pulse
  - Respirations
  - Blood pressure
- Vital signs and other physiologic measurements can be the bases for problem solving.
- Many facilities have developed a fifth vital sign—pain level/comfort level.

Guidelines for Obtaining Vital Signs

- The Psych Tech must be able to do all of the following:
  - Measure vital signs correctly
  - Understand and interpret the values
  - Communicate/document findings accurately
  - Begin interventions as needed
Oximetry
- A non-invasive device that measures the level of oxygenation in the blood.
- An excellent addition to information received via vital signs.
- Will have a lesson on the operation and values of oximetry in the nursing lab.
- Peg try to get a picture of example

Temperature
- Temperature is a relative measure of sensible heat or cold.
- The body strives to maintain a temperature of 98.6° F (37° C), which is considered normal.
- Normal range is 97° to 99.6° F (36.1° to 37.5° C).
- The hypothalamus helps maintain a balance between heat lost and heat produced by the body.

Temperature
- Many factors can cause body temperature variances.
  - Environment
  - Time of day
  - Patient’s state of health
  - Activity levels
  - Stage of monthly menstrual cycle
Temperature

Two Types of Body Temperature

Core Temperature
- Temperature of the deep tissues of the body
- Remains relatively constant unless exposed to severe extremes in environmental temperature
- Assessed by using a thermometer device

Surface Temperature
- Temperature of the skin
- May vary a great deal in response to the environment
- Assessed by touching the skin

Temperature measurements are obtained by several methods.

- Heat-sensitive patches
  - Patch placed on the skin; color changes on the patch indicate temperature readings

- Electronic thermometers
  - Consist of a rechargeable battery-powered display unit, a thin wire cord, and a temperature processing probe

- Tympanic thermometer
  - Special form of electronic thermometer; inserted into auditory canal

Figure 11-2

Disposable, single-use thermometer strip.

Temperature

Pyrexia, Febrile, or Hyperthermia
- When the temperature is above normal
- Fever is actually a body defense; it will destroy invading bacteria.

Classification of Fevers
- Constant: remains elevated consistently
- Intermittent: rises and falls
- Remittent: temperature never returns to normal until the patient becomes well

Hypothermia
- An abnormally low body temperature
Temperature
- Oral temperature is not obtained in the comatose or disoriented patient or in small infants.
- Rectal temperatures are contraindicated for patients with recent rectal surgery or certain conditions of the perineum.
- Axillary temperature is considered the least accurate method.
- Rectal readings are normally 1° F higher than oral, and axillary readings are 1° F lower than oral.

Auscultating Using the Stethoscope
- When assessing the apical heart rate, the PT uses a stethoscope.

Figure 11-6
- Parts of a stethoscope.
Auscultating Using the Stethoscope

- **Chestpiece**
  - Diaphragm: circular, flat-surfaced portion of the chest piece covered with a thin plastic disk
  - Transmits high-pitched sounds created by the high-velocity movement of air and blood
- **Bell**: bowl-shaped chestpiece, usually surrounded by a rubber ring.
  - Transmits low-pitched sounds created by the low-velocity movement of blood.

Pulse

- There is a rhythmic beating or vibrating movement.
- The pulse is the regular, recurrent expansion and contraction of an artery produced by waves of pressure caused by the ejection of blood from the left ventricle of the heart as it contracts.
- The PT notes the rate, rhythm, and volume of the pulse.
- Adult pulse rate is normally between 60 and 100 beats per minute.

Figure 11-7

Pulse sites.
Pulse

- Tachycardia
  - The pulse is faster than 100 beats per minute.
  - It may result from shock, hemorrhage, exercise, fever, acute pain, and drugs.
- Bradycardia
  - The pulse is slower than 60 beats per minute.
  - It may result from unrelieved severe pain, drugs, resting, and heart block.

Dysrhythmia

- Any disturbance or abnormality in a normal rhythmic pattern, specifically irregularity in the normal rhythm of the heart
- Any artery can be assessed for pulse rate, but the radial and carotid arteries are peripheral pulse sites that are easily palpated.
- The radial and apical locations are the most common sites for pulse rate assessment.

Figure 11-9

A. Point of maximum impulse is at fifth intercostal space. B. Assessing apical pulse.
Pulse

- Pulses on both sides of the peripheral vascular system should be assessed.
- Pulses are palpated using the pads of the index and middle fingers; only slight pressure is applied over the artery to avoid obliterating the pulse.
- Apical pulse represents the actual beating of the heart.

Pulse

- When auscultated, the "lubb-dubb" heard represents one cardiac cycle, or heartbeat.
- Pulse deficit: difference between the radial and apical rates; signifies that the pumping action of the heart is faulty.

Figure 11-8

Taking an apical/radial pulse.

Respirations

- The taking in of oxygen, its utilization in the tissues, and the giving off of carbon dioxide; the act of breathing.
  - Internal Respirations
    - The exchange of gas at the alveolar level
  - External Respirations
    - Breathing movements that can be observed by the nurse; inspiration and expiration

Respirations

- Assessment includes the rate, depth, rhythm, and quality.
  - The normal rate for an adult is between 12 and 20 per minute.
    - Tachypnea
      - Rapid respiratory rate; exercise and fever increase respiratory rate
    - Bradypnea
      - A slow respiratory rate, below 12 per minute
  - The depth of respiration is determined by the amount of air taken in with inhalation.

Figure 11-10

Patterns of respirations.
Respirations
- Assessment includes the rate, depth, rhythm, and quality. (continued)
  - The rhythm of respiration should be regular and uninterrupted.
- Dyspnea
  - Breathing with difficulty
- Apnea
  - A lack of spontaneous respirations
- Cheyne-Stokes respirations
  - An abnormal pattern of respiration; alternating patterns of apnea and deep, rapid breathing.

Blood Pressure
- The pressure exerted by the circulating volume of blood on the arterial walls, veins, and chambers of the heart.
  - Systolic
    - The higher number; represents the ventricles contracting
  - Diastolic
    - The second number; represents the pressure within the artery between beats
  - Pulse Pressure
    - Difference between the systolic and diastolic

Blood Pressure
- Normal blood pressure in the adult is 120/80 mm Hg.
- Hypertension
  - Sustained elevated blood pressure is above 140/90 mm Hg
- Hypotension
  - Blood pressure is below normal.
- Orthostatic Hypotension
  - A drop of 25 mm Hg in systolic pressure and a drop of 10 mm Hg in diastolic pressure when moving from lying to sitting or sitting to standing.
Blood Pressure

- Sphygmomanometer
  - A device for measuring the arterial blood pressure
  - Consists of an inflatable cuff and a gauge
  - The cuff is inflated around the patient’s arm to compress the artery; then it is slowly deflated while the nurse listens at the brachial artery with a stethoscope and hears pulsating sounds.
  - Korotkoff sounds: The first sound heard is the systolic pressure; the point at which the last sound is heard is the diastolic pressure.

Figure 11-11

Figure 11-12

Aneroid manometer and cuff.

Wall-mounted aneroid sphygmomanometer.
Figure 11-17
Electronic sphygmomanometer.

Figure 11-14
Doppler stethoscope over brachial artery to measure blood pressure.


Figure 11-13
The sounds during blood pressure measurement can be differentiated into five Korotkoff phases.

Blood Pressure

- Assessment of Blood Pressure in the Lower Extremities
  - Occasionally, the upper extremities may be inaccessible, so blood pressure must be measured in the lower extremities.
  - The popliteal artery, located behind the knee, is the site for auscultation.
  - The cuff must be wide and long enough to allow for the larger girth of the thigh and is positioned with the bladder over the posterior aspect of the mid thigh.

Figure 11-15, A

A. Lower-extremity blood pressure cuff positioned above popliteal artery at mid thigh.

Figure 11-15, B

B. Location of the popliteal artery and placement of the cuff.
Blood Pressure

- Automatic Measurement Devices
  - Many automatic devices can determine blood pressure automatically.
  - Once the cuff is applied, the nurse can program the device to obtain and record blood pressure readings at preset intervals.
- Self-Measurement
  - Portable home devices
  - Stationary automated machines

Height and Weight

- Helps assess normal growth and development
- Aids in proper drug dosage calculation
- May be used to assess the effectiveness of drug therapy, such as diuretics
- Significant loss of weight may be a sign of an underlying disease

Figure 11-16

Automatic blood pressure monitor.

(Photo courtesy Critikon, Inc., Tampa, Fla.)
Height and Weight

**Height**
- Patient should remove shoes and stand erect.
- A measuring stick or tape may be attached vertically to the weight scales or wall.
- Standing scales may have a metal rod, which is attached to the back of the scale and swings out over the top of the patient’s head.

**Weight**
- Types of scales
  - Standing scales
  - Chair scales; lift scales
    - Used for patients who cannot stand
- Patients should be weighed at the same time of day, on the same scale, and in the same type of clothing to allow an objective comparison of subsequent weighing.
- Patient should void before weighing.

Figure 11-18


When Vital Signs Are Assessed

- Temperature, pulse, respirations, and blood pressure are usually assessed at the same time at set intervals.
- A set of vital signs is taken when the patient is admitted to the facility and then as prescribed by the physician or as policy dictates.
- Example: every 4 hours; once a shift; weekly

- The more ill the patient, the more frequently vital signs are taken.
- Vital signs are interrelated.
  - A rise in temperature of 1°F may cause an increase in pulse rate of 4 beats per minute.
  - Respiratory rate and blood pressure readings increase with a rise in temperature.
  - Blood pressure falls because of hemorrhage, the pulse and respirations increase and the temperature usually decreases.

Recording Vital Signs

- Graphic Flow Sheet
  - Used for charting vital signs
  - R indicates a rectal temperature
  - Ax indicates an axillary temperature
  - Blood pressures are always written with the systolic first and the diastolic beneath.
    - Example: 120/80
  - Apical pulse is indicated with an “ap” after next to the number.
    - Example: 78 ap
Recording Vital Signs

- Any abnormal findings are reported to the nurse-manager or physician immediately.
- Any accompanying or precipitating signs and symptoms such as chest pain, vertigo, shortness of breath, flushing, and diaphoresis should be recorded as well.
- The nurse documents any interventions initiated as a result of vital sign measurement, such as tepid sponging.

Nursing Process

- Assessment
  - Normal daily fluctuations
  - Factors likely to interfere with accuracy of vital sign reading
  - Medications that may influence vital signs
  - Factors that influence vital signs
  - Conditions that precipitate fever, such as infections
  - Pertinent laboratory values
  - Previous baseline vital signs from patient’s record

- Nursing Process
  - Fluid volume deficient
  - Hyperthermia
  - Hypothermia
  - Body temperature, risk for imbalance
  - Gas exchange, impaired