Vital Signs

Vital signs are indicators of health and the state of the body. The four main vital signs are temperature, pulse, respiration and blood pressure. Many health professionals are now regarding the degree of pain as the 5th vital sign (patients rank on a scale of 1-10). Other important indicators include skin color, size and reactivity of the pupils, the level of consciousness, and the patient's response to stimul

Temperature - a measurement of the balance between heat lost and heat produced by the body.

Heat is lost through perspiration, respiration and excretion. Heat is produced by the metabolism of food, and by muscle and gland activity

The normal range for body temperature is from 97° - 100° Fahrenheit, 36.1° - 37.8° Celsius.

4 common sites to measure temperature:

- Mouth (oral) - taken for 3-5 minutes
- Rectum (rectal) - taken for 3-5 minutes
- Armpit (axillary) - taken for 10 minutes
- Ear (aural) - taken for a few seconds
  (also called tympanic)

Factors that lead to increased body temperature:

Illness, Infection, Exercise, Excitement, Exposure (sun)

Factor that lead to decreased body temperature:

Starvation/Fasting, Sleep, Decreased muscle activity, Mouth breathing Disease, Exposure (cold temp.)

Problems:

Fever - elevated body temperature (usually above 101° F/38.3° C

Pyrexia - another term for fever

Febrile means fever is present. **Afebrile** means no fever.

Hypothermia - low body temp. (below 95° F or _____°C), caused by prolonged exposure to cold; death usually occurs if the body temperature drops below 93° F or _____ ° C

Hyperthermia - high body temp. (above 104° F or _____ ° C), caused by prolonged exposure to heat, brain damage, and serious infections; temperatures above 106° F or _____ ° C can quickly lead to convulsions, brain damage and death

Pulse - throbbing of the arteries, caused by the contractions of the heart

Major pulse sites include:

a. temporal - side of the forehead
b. carotid - at the neck
c. brachial - crease of the elbow
d. radial - inner aspect of wrist, above thumb
e. femoral - inner aspect of upper thigh
f. popliteal - behind the knee
g. dorsal pedis (pedal) - top of the foot arch

Rate is the number of beats per minute and varies depending on age, sex, and body size.
Rhythm refers to the regularity or the spacing of the beats.
Volume is the strength or intensity of the pulse.

Normal Pulse Range:

Adults - 60 to 80 (Men - 60 to 70 Women - 65 to 80)
Children over 7 - 70 to 90
Children 1 to 7 - 80 to 110
Infants - 100 to 160

Apical pulse - a pulse taken with a stethoscope at the apex of the heart The actual heartbeat is heard and counted. A physician may order an apical pulse for irregular heartbeats, children, hardening of the arteries and a weak or rapid pulse.

Problems:

Bradycardia - a pulse rate under 60 beats/minute
Tachycardia - a pulse rate over 100 beats/minute
Arrhythmia - an irregular/abnormal rhythm, usually caused by a defect in the electrical conduction pattern of the heartbeat
Pulse Deficit - may occur when a weak heart does not pump enough blood to produce a pulse, or when the heart beats too fast (the heart is unable to fill with blood) and therefore doesn't produce a pulse during each beat. In such cases, the apical pulse is higher than the rate at any other pulse site on the body. The apical pulse is then compared to the radial pulse.

Respiration - the process of taking in O_2 and expelling CO_2

Rate measures the number of respirations per minute.
One respiration consists of 1 inspiration (in) and 1 expiration (out).
Rhythm refers to the regularity of the respirations.
Character refers to the depth and quality of the respirations.

Normal Respiration Rates:

Adults - 14 to 18
Children - 16 to 25
Infants - 30 to 50

(12 - 20/minute)

Problems:

Dyspnea - difficult or painful breathing
Apnea - absence of breathing, usually temporary
Tachypnea - rate above 25 per minute
Bradypnea - rate below 10 per minute
Orthopnea - sever dyspnea; breathing is very difficult in any position other than sitting erect or standing
Cheyne-Stokes - alternating periods of dyspnea and apnea; frequently noted in dying patients
Rales - bubbling or noisy sounds caused by fluid or mucus in the air passages
Wheezing - high-pitched whistling or sighing sound during expiration; caused by narrowing of bronchioles (asthma) and/or obstruction or mucus in the bronchi
Cyanois - a dusky, bluish discoloration of the skin, lips and/or nails as a result of decreased oxygen and increased CO_2 in the bloodstream

Blood Pressure - a measurement of the pressure that the blood exerts on the walls of the arteries. B.P. is measured in millimeters (mm) of mercury (Hg) on an instrument called a sphygmomanometer.

Systolic - pressure when the left ventricle contracts. A normal reading is 120 mm Hg, with a normal range from 100 to 140 mm Hg.
Diastolic - the constant pressure against the arteries when the heart is at rest. A normal reading is 80 mm Hg, with a normal range from 60 to 90 mm Hg.

* 120/80 mmHg

Pulse pressure is the difference between systolic and diastolic pressure A normal range is 30 to 50 mm Hg. (120/80 mm Hg = a pulse pressure of 40 mm Hg)

Problems:

Hypertension - high blood pressure (above 140/90 mm Hg). Causes include: stress, anxiety, obesity, high salt intake, aging, kidney disease, thyroid deficiency and vascular conditions such as arteriosclerosis. It can lead to stroke, kidney disease and/or heart disease.

Hypotension - low blood pressure (below 100/60 mm Hg). Causes include: heart failure, dehydration, depression, severe burns, hemorrhage and shock.

Orthostatic Hypotension (postural) - a sudden drop in both systolic and diastolic pressure when an individual moves from lying to sitting or standing. Blood vessels don't adjust quickly enough, so the individual becomes light headed and dizzy, and may experience blurred vision. Symptoms last a few seconds until the vessels compensat and send more blood to the brain.