Vital Signs

Unit 2 Part 1

Assessing Patient's Status and Vital Signs

Be aware of your patient!

Take note to the hallpass if your patient is an inpatient

Don’t be afraid to take action if needed

Normal Vital Ranges
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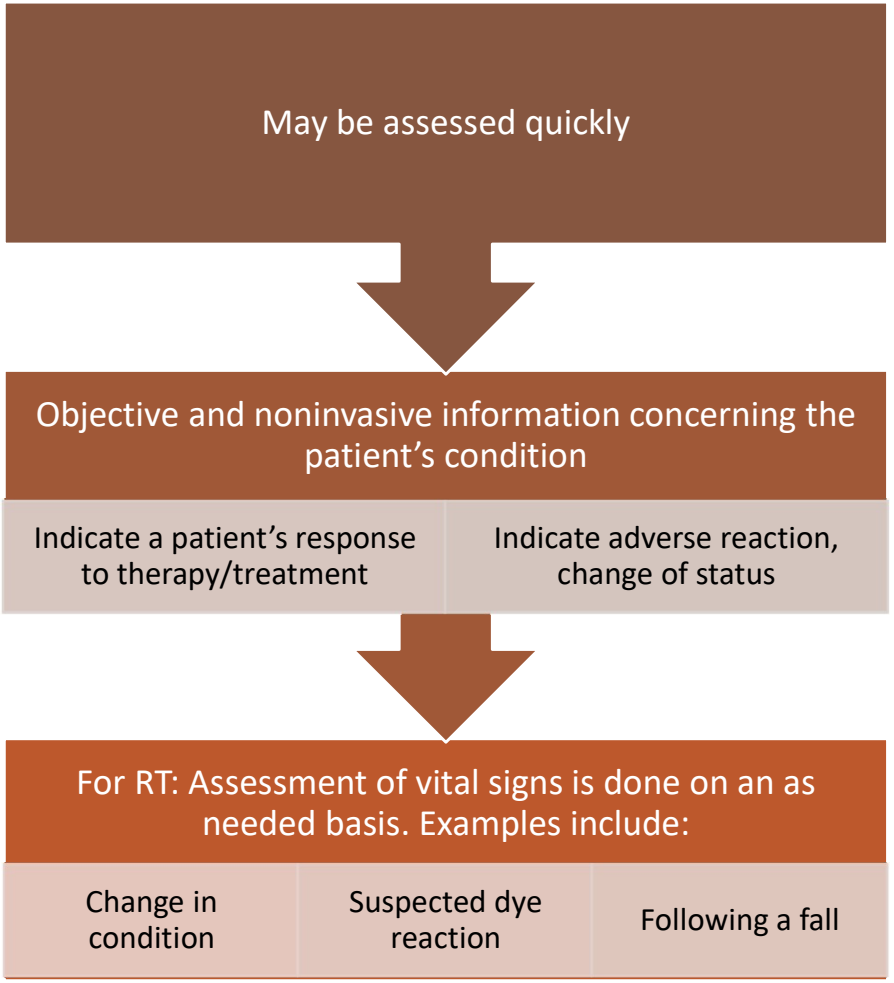
Homeostasis

Relative Constancy in the internal environment of the body

Naturally maintained by adaptive responses that promote healthy survival (vital signs)

- Heartbeat
- Blood pressure
- Body temperature
- Respiratory rate
- Electrolyte balance

Vital Signs


May be assessed quickly
Objective and noninvasive information concerning the patient's condition
Indicate a patient's response to therapy/treatment
Indicate adverse reaction, change of status
For RT: Assessment of vital signs is done on an as needed basis. Examples include:
Change in condition
Suspected dye reaction
Following a fall

Body Temperature

Measurement of degree of heat of the deep tissues of the body

- Oral = 98.6 ° F (37° C)
- Rectal = 99.6 ° F
  - Most accurate
- Axillary = 97.6° F
  - Least accurate, most difficult

Thermoregulation –body's maintenance of heat production and loss

- Hypothalamus plays a role in preservation of heat (shivering) and regulation of heat loss (sweating)
- Important for body temperature to remain constant (even when environment changes)

Five routes commonly used…

1. Oral
2. Axillary
3. Rectal
4. Tympanic
5. Temporal

THERE IS ONE MORE ….

Infrared Digital Thermometers

Body Temperature
Significance of Abnormalities

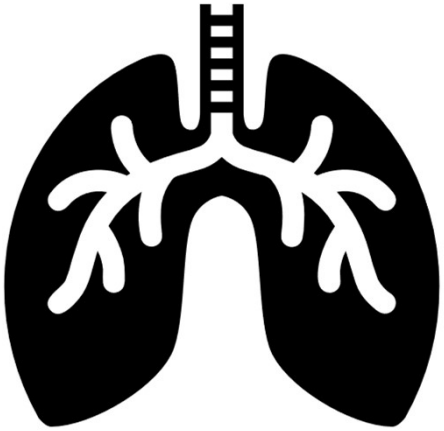
Hyperthermia – oral temperature higher than 99.5 ° F

- Otherwise known as a fever= febrile = pyrexia
- Metabolic rate changes accordingly and demands the cardiopulmonary system to also change
  - *Examples*: viral and bacterial infections, postoperative infection, injury to hypothalamus
- Reactions from patients – confusion, dizzy, comatose

Hypothermia – temperature falls below normal range

- *Examples*: exposed to cold environmental temperatures, trauma to hypothalamus, heart surgery
- Medically induced – therapeutically decrease body's need for oxygen

Respiratory Rate



Ventilation

- Mechanical movement of air into and out of the lungs
- Respiratory system delivers O2 from environment to body tissues
- Eliminates CO2 from tissues to environment
- This gas exchange is necessary for survival
- Diaphragm is major muscle of ventilation
  - On inspiration, diaphragm contracts
  - On expiration, diaphragm relaxes

Respiration=Combination of inspiratory and expiratory phase of breathing

Assessed by observing the rise (inspiration) and fall (expiration) of the chest or placing hand on the chest

- Assess when patient is unaware so they do not alter their breathing rate and pattern

Healthy adults – normal respirations are silent and effortless, automatically occur at regular intervals

Measured by: breaths per minute

- *Adult at rest*: 12-20
- *Children under 10*: 20-30
- *Newborns*: 30-60

Counting respirations for a minimum of 1 minute is important to obtain an accurate measurement

Can also assess the depth (shallow, normal, deep) and pattern (regular or irregular) of ventilation

Cellular metabolism increases = demand for O2 increase = production of CO2 increases= increase respiratory rate

Tachypnea – respiratory rates greater than 20 breaths per minute (adult patient)

- Common causes: exercise, fever, anxiety, pain, infection

Bradypnea – decrease in the respiratory rate

- Occurs less frequently than Tachypnea
- Caused by: depression of the respiratory center of the brain
  - *Example*: drug overdose, head trauma, and hypothermia

Respiratory Rate
Significance of Abnormalities

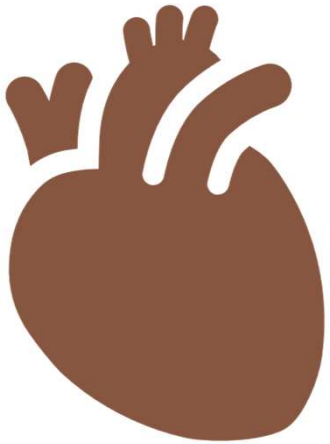
Dyspnea – difficulty breathing

Orthopnea – difficulty breathing unless sitting up or standing erect

Apnea – absence of spontaneous ventilation

Respiratory Rate
Significance of Abnormalities

Pulse



Rate of contractions of the heart

Measured by: palpating superficially located arteries

- Common sites:
  - Radial artery (thumb side of the wrist)
  - Brachial artery (antecubital fossa of adults and upper arm of infants)
  - Carotid artery (neck)

Additionally measured by stethoscope over heart counting each heartbeat (auscultation) = apical pulses

Auscultation - the action of listening to sounds from the heart, lungs, or other organs, typically with a stethoscope, as a part of medical diagnosis.

How to measure pulse?

2nd and 3rd digits placed over pulse point

Counted for 60 seconds

Assess strength and regularity

Normal Adult Resting Pulse Rate: 60-100 BPM (beats per min)

Children: 70-120 BPM

During CPR: assess carotid to assess effectiveness of chest compressions

- Adult – carotid pulse
- Infant – brachial pulse

In Critical Care Settings….

Use pulse oximeter

Light-emitting probe is placed on finger, foot, toe, earlobe, temple, nose or forehead of patient

Oximeter converts light intensity into oxygen saturation and pulse rate values

Normal Values : 95%-100% (SpO2)

Factors can affect accuracy:

- Movement, misplaced/loose lines, nail polish, etc.

Tachycardia

- Increase of more than 20 BPM or greater than 100BPM
  - *Examples*: exercise, fever, respiratory disorder, CHF, shock
  - Also stimulated by pain, anger, fear but stimulus is from nervous system not need for oxygen

Bradycardia

- Decrease in heart rate
  - *Examples*: unrelieved pain, severe pain, hypothermia

Pulse
Significance of Abnormalities

Warning……Warning

If no pulse is felt at wrist, or if cardiac arrest is thought to occur you should:

- Assess pulse at carotid artery for a full 5 seconds while Emergency help is summoned

If pulse irregularities are accompanied by palpitations, dizziness, or faintness:

- Notify physician – these symptoms could be life-threatening

Blood Pressure

Measure of the force exerted by blood on the arterial walls during contraction and relaxation of the heart

- Just like water in a hose

Systolic – contraction of heart (increase pressure on walls)

Diastolic – relaxation of heart (constant pressure)

How do I measure?

Sphygmomanometer and stethoscope

- Sphygmomanometer – cuff, tubing, a valve, a bulb, and a manometer attached to the cuff
  - Mercury
  - Aneroid (more common)

Patient seated and arm at level of heart

Cuff placed on upper arm, midway between the elbow and shoulder

- Inflated above patient's systolic pressure to stop blood flow (collapses brachial artery)

Stethoscope placed over brachial artery in antecubital fossa of elbow

Slowly release cuff pressure

Blood flow returns and can be heard

First sound corresponds to the systolic pressure

When blood flow can no longer be heard corresponds to the diastolic pressure

Korotkoff sounds – turbulent sound of blood flow through the arteries


140
160
180
200
220
120
240
100
260
80
280
60
300
40
20
mmHg

How do I read it?

Recorded in millimeters of mercury (mm Hg) read from manometer

Systolic/diastolic

Adult Normal Values:

- Systolic: less than 120 mm Hg
- Diastolic: less than 80 mm Hg

Hypertension = persistent elevation of blood pressure above 140/90 mm Hg

- Common, but patient unaware, no symptoms exist
- Increases workload of heart and can damage brain in minutes
- Moderate degree of hypertension can cause damage to heart, brain, kidneys, lungs, and other organ systems
- Stress, medications, obesity, and smoking and contribute to hypertension
- Higher in men than women

Blood Pressure
Significance of Abnormalities

Hypotension = low blood pressure

- Less than 95/60 mm Hg
- Usually desirable and not problematic unless it produces symptoms
- Concerns: dizziness, confusion, or blurred vision = ??? inadequate circulating blood volume = evaluation needed immediately
- Shock from: severe bleeding, burns, vomiting, diarrhea, trauma, or heat exhaustion = decrease in total blood volume = immediate care needed

Blood Pressure
Significance of Abnormalities

Blood Pressure
Significance of Abnormalities

Orthostatic Hypotension (Postural Hypotension)

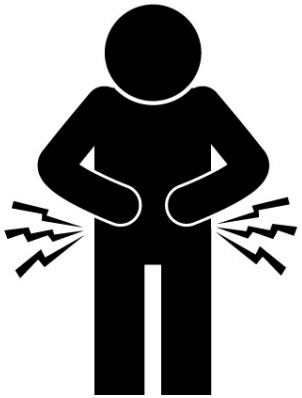
- BP that falls 20 mm Hg or more when a patient sits or stands. Blood leaves the central organs (especially the brain) and moves to the periphery causing the person to feel faint.
- Give the patient time and let them tell you when they are ready.

What should you consider as a 5th Vital Sign…..

I'LL TELL YOU…..

Pain

- A highly unpleasant and very personal sensation
- No two people experience pain in exactly the same way
- Can cause sleep loss, irritability, cognitive impairment, functional impairment, and immobility
- Pain is protective—warning us of a potential problem/injury to the body
- Assess all factors that affect the pain experience
  - Physiological, psychological, emotional, and sociocultural



Also Assess….

DESCRIPTION OF PAIN

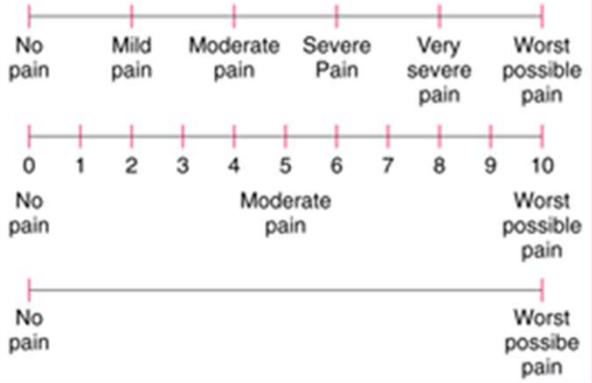
INTENSITY OF PAIN

LOCATION OF PAIN

DURATION OF PAIN

AGGRAVATING AND ALLEVIATING FACTORS OF PAIN

Visual Analog Scale



Word Descriptor Scale

0 = No pain
1 = Mild pain
2 = Distressing pain
3 = Severe pain
4 = Horrible pain
5 = Excruciating pain

Graphic Scale

Verbal Scale

"On a scale of 0 to 10, with 0 meaning no pain and 10 meaning the worst pain you can imagine, how much pain are you having now?"

Functional Pain Scale

0 = No pain
1 = Tolerable and pain does not prevent any activities
2 = Tolerable and pain prevents some activities
3 = Intolerable and pain does not prevent use of telephone, TV viewing, or reading.
4 = Intolerable and pain prevents use of telephone, TV viewing, or reading.
5 = Intolerable and pain prevents verbal communication