Introduction to Nursing
Vital Signs Outline – Day 3

Vitals Signs
- Pay attention to results & look at all values together
- Keep in mind the client's current and past health history
- What is normal for them?
- What is normal for the facility?

Vital Signs Can:
- Identify an acute medical problem
- Quantify magnitude of illness & body's response to that stress
- Be a marker of chronic disease
- Reflect changes in body function that otherwise might not be observed

When Do I Assess Vital Signs?
- Per facility policy
- Per healthcare provider order
- Other times
    - Baseline (admission)
    - Change in health status or reports symptoms
        - Chest pain, feeling "faint"
    - Before or after surgery or invasive procedure
    - Before or after meds or treatments
    - Before or after nursing interventions that could affect VS

Vital signs
- Temperature-T
- Pulse-P
- Respirations-R
- Blood Pressure-B/P.
- Pain as the 5th Vital Sign
- Oxygen Saturation (Pulse Ox or SpO2) measured @ same time

Blood Pressure
- Blood Pressure is a measure of the pressure exerted by the blood as it flows through the arteries
- _____ Pressure = Force of blood exerted against walls of arteries when ventricles _____
- _____ Pressure = Force of blood exerted against walls of arteries when ventricles at _____
- Measured in millimeters of mercury (mmHg)
    - "Normal Adult" = less than ____ /less than ____

Alterations in Blood Pressure

- Hypertension
  - BP persistently _____ normal
  - Present on two different occasions
  - Usually asymptomatic
- Hypotension
  - BP _____ expected range
  - SBP below 90 mmHg when normally higher
  - Can be symptomatic…or not
- Orthostatic Hypotension
  - BP drops with _____ change
    - Patient feels faint
    - Must change positions slowly
  - How to assess for this?
    - Obtain BP and HR in 3 different positions
    - Lie, Sit, Stand (in that order)
    - Drop in SBP > 20 mmHg or DBP > 10 mmHg with increase in HR by 10 – 20% = orthostatic hypotension

Factors Affecting Blood Pressure

- Age
- Exercise
- Stress
- Gender
- Ethnicity
- Medications
- Obesity/Diet
- Diurnal Rhythm
- Temperature
- Family history

Equipment for Checking Blood Pressure

- Stethoscope
- Blood pressure cuff
  - Bladder must be correct size
  - Width should be 40% of limb circumference
  - Bladder (inside the cuff) should wrap 80% around arm (or other limb) of adult
- Sphygmomanometer
  - Digital (automatic) manometer
    - Electronic readings
  - Aneroid (manual) manometer
    - Calibrated dial with needle that points to readings

Assessing the Blood Pressure

- Sites

  - Usually _____ artery
  - Forearm, thigh & calf if needed
- Contraindications
  - Injury/trauma (including surgery)
  - Cast
  - Mastectomy or surgical removal of lymph nodes
  - IV site/PICC line
  - AV fistula

Measuring B/P at Brachial Site

- Support patient's arm at _____ level
- Expose arm completely—no BP's over clothing
- Wrap cuff smoothly, snugly around arm
- Place center of bladder over brachial artery where base of cuff 1" above antecubital space (bend in elbow)
- Palpate brachial pulse, place stethoscope over artery
- Close valve on inflating bulb & squeeze rapidly to inflate cuff until reads 30mmHg higher than "usual" SBP
- Release air screw valve <u>slowly</u> and allow dial to fall gradually (2-3 mmHg/sec.)
- Listen for Korotkoff's sounds-- sounds heard due to obliteration and return of arterial blood flow. Record:
  - First sound = _____
  - Last sound = _____

Korotkoff's Sounds

- Korotkoff's sounds are heard as blood begins to flow through artery
  - **Phase 1**: first faint clear tapping = systolic sound
  - **Phase 2**: Swishing, whooshing sound.
  - **Phase 3**: Crisper, more intense sound.
  - **Phase 4**: Distinct muffling sound.
  - **Phase 5**: Silence = diastolic sound
  - Continue to listen 10-20 mmHg below last sound to confirm your reading, then open cuff valve & completely deflate.

Common Errors in Assessing BP

- Hurrying by the nurse
- Subconscious bias
- Improper size cuff, wrapped too loosely
- Arm not at heart level
- Assessing immediately after activity
- Failure to identify auscultatory gap
- Listening over clothes
  - Improper environment (noise, pt. talking)
- If you are unsure, _____

<u>Pulse</u>

- Rhythmic dilation of the arteries and pulsation of blood flow occurring with each contraction of the heart
- Rhythm: pattern of the beats

  - Regular vs Irregular
  - Arrhythmia or dysrhythmia
- Can be noted at various points on the body
- Peripheral pulse
  - Located away from _____
- Apical pulse (AP)
  - Central pulse located at _____ of heart
  - Also called the point of maximal impulse (PMI)
  - Check AP x 1 min

Grading Pulses -Pulse Strength (Amplitude)

- Volume of blood ejected with each heart contraction
- Ranges from absent to bounding
  - +0 Absent pulse
  - +1 Weak, thready
  - +2 Diminished
  - +3 Normal
  - +4 Bounding

Alterations in Pulse Rate

- Tachycardia
  - Pulse > _____bpm
  - Causes: _____
- Bradycardia
  - Pulse < _____bpm
  - Causes: _____

Assessing the Pulse

Rate: Number of beats per minute (bpm)

- For resting heart rate:
  - Adults: ____ to ____ bpm

Symmetry:

- Compare on each side of body
  - If both the same, “bilaterally equal”
- *Consider This:* Palpation of a peripheral pulse = presence of more proximal pulses

Factors Affecting the Pulse

- Age
- Exercise
- Fever
- Medications
- Hypovolemia
- Stress/Pain
- Position change

Pulse Sites

Refer to the pulses handout

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

Equipment for Checking the Pulse

- Watch with second hand
- Stethoscope
- Doppler – For difficult to detect pulses

Body Temperature

- Reflects balance between heat produced & heat lost from the body
- Measured in degrees
- Expected body temperature _____
- Two types
  - _____ Temperature (deep tissues)
    - Remains relatively constant
    - Normal is a range (97-99 F or 36-37.5 C--oral)
  - _____ Temperature (shell)
    - Skin, subcutaneous tissue
    - Rises & falls in response to environment

Alterations in Body Temperature

- Hyperthermia / Fever
  - Temp above usual range : _____
  - Client with fever is “febrile”; without fever is “afebrile”
  - Causes of elevated temperature
    - Pathogens (bacteria, fungi, virus)
    - Head injury (damage to hypothalamus)
    - Environmental exposures
      - Heat exhaustion & heat stroke
- Hypothermia
  - Core body temp below lower limit of normal
  - Causes of depressed temperature
    - Excessive heat loss
    - Inadequate heat production to counteract loss
    - Impaired hypothalamic thermoregulation
    - May be accidental or induced

Factors Affecting Heat Production

- Basal Metabolic Rate (BMR)
- Muscle Activity
- Thyroxine output
- Testosterone
- Sympathetic stimulation/stress response

Factors Affecting Heat Loss

- As body produces heat, it also loses it through:
    - Radiation
    - Conduction
    - Convection
    - Evaporation

Factors Affecting Body Temperature

- Age
- Hormones
- Exercise
- Illness & Injury
- Food or fluid intake
- Smoking
- Circadian rhythms
- Stress
- Environment

Types of Thermometers (Equipment)

- Electronic
    - Use disposable probe cover
    - Measures oral, rectal or axillary temps
    - Color coded probes
        - Red-_____, blue-_____
    - <60 seconds

Procedures for Taking a Temperature

- Oral
    - Advantages:
        - Accessible, convenient, relatively constant
    - Disadvantages:
        - Inaccurate after eating or smoking
    - Contraindicated:
        - Confused or agitated patients
        - Facial trauma

        - Mouth Breathers

- Rectal
    - Advantages:
        - Reliable
    - Disadvantages:
        - Inconvenient, uncomfortable
    - Contraindicated:
        - Diarrhea, rectal disease or surgery

- Axillary
    - Advantages:
        - Safe, noninvasive, good option for confused/agitated
    - Disadvantages:
        - Less accurate?
    - Contraindicated: None known.

- Tympanic
    - Advantages:
        - Fast, accurate
    - Disadvantages:
        - Presence of cerumen may affect
        - Can be uncomfortable
    - Contraindicated:
        - Injury to ear canal

- Temporal
    - Advantages:
        - Safe, fast, noninvasive
    - Disadvantages:
        - Adjustments needed if sweat on forehead
        - Expensive
    - Contraindications: None known

Respirations

- Body's mechanism for exchanging _____ & _____ b/t atmosphere and blood/cells of the body.
- Accomplished through breathing
- Breathe in O2 & Breathe out CO2
- Respiration consists of an _____ & an _____

Assessing Respirations

- Assess when pt. relaxed and not aware
- Before assessment be aware of:
    - Normal breathing pattern

- Medications, therapies, or conditions that may affect breathing

Rate

- Breaths per minute
- Normal = ____ - _____ per minute
  - 1 inspiration & 1 expiration = 1 breath

Depth

- Amount of chest wall expansion that occurs with each breath.
- Normal, deep, or shallow

Rhythm

- Breathing intervals
  - Regular or irregular
- Normally are evenly spaced
- Always count for a _____

Quality (Effort & Ease of Breathing)

- Unlabored or Labored?
- Quiet or noisy?
  - Labored or noisy breathing is abnormal
- Indications of labored breathing
  - Dyspnea: _____
  - Orthopnea: _____

Alterations in Respiration

- Tachypnea
  - RR > _____
  - Can be r/t anxiety, activity, pain, other health conditions
- Bradypnea
  - RR < _____
  - Can be r/t medications (such as opioids/sedatives), or other health conditions

How would these factors affect respiratory rate?

- Exercise
- Stress
- Pain
- Smoking
- Body position
- Medications
- Higher altitude
- Anemia
- Sleep

Assessing Respirations

- Goal of respirations?
- How do you know if respirations effective?

Oxygen Saturation

- Oxygen saturation is the estimated amount of oxygen bound to the hemoglobin
- Expressed as a percentage
- Direct reflection of the clients respiratory status
- Normal SpO2 = _____-_____%
    - Keep above 90% at a minimum, unless client has known underlying illness (i.e. COPD)
    -

Alterations in Oxygenation

- O2 sat < ____
- Possible causes include COPD, pneumonia, pulmonary edema
- Common symptoms: _____ & _____

Equipment

- Pulse Oximeters
    - Noninvasive, indirect measurement of O2 saturation (SpO2) of the blood
    - Provides digital reading of pulse rate & SpO2

Recording & Reporting

- Document in client record on electronic medical record (EMR)
    - Indicate appropriate route for temp, pulse, and BP
- Relate results to patient situation
- Conduct appropriate follow-up
    - Notify instructor first and then RN
    - Give medication or treatment as ordered
- Conduct appropriate follow-up based on interventions