

PREMIUM EDITION FOR NURSING STUDENTS

# *Fundamentals of Nursing*

NOTES READY TO STUDY



# ABGs, or arterial blood gases

Normal Arterial Blood Gas Values	
pH	7.35 - 7.45
PaCO <sub>2</sub>	35 - 45 mm Hg
PaO <sub>2</sub>	70 - 100 mm Hg **
SaO <sub>2</sub>	93 - 98%
HCO <sub>3</sub>	22 - 26 mEq/L
%MetHb	< 2.0%
%COHb	< 3.0%
Base excess	-2.0 to 2.0 mEq/L
CaO <sub>2</sub>	16 - 22 ml O <sub>2</sub> /dl

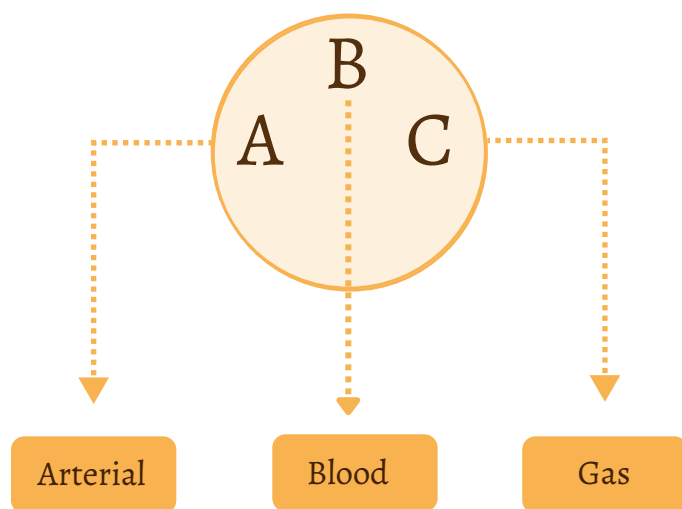
Primary Disorder	pH	pCO <sub>2</sub> or HCO <sub>3</sub>
Respiratory Acidosis	pH low	pCO <sub>2</sub> high
Metabolic Acidosis	pH low	HCO <sub>3</sub> low
Respiratory Alkalosis	pH high	pCO <sub>2</sub> low
Metabolic Alkalosis	pH high	HCO <sub>3</sub> high

Acid-base balance  
Henderson - Hasselbalch Equation

$$pH = pK + \log \frac{[HCO_3^-]}{0.03 [PaCO_2]}$$

The H-H equation can be condensed to the following fundamental relationships for educational purposes:

$$pH \sim \frac{[HCO_3^-]}{[PaCO_2]}$$



pH is inversely related to [H<sup>+</sup>]; a pH change of 1.00 represents a 10-fold change in H<sup>+</sup>]

pH [H<sup>+</sup>]

in nanomoles/L

7.00	100
7.10	80
7.30	50
7.40	40



# ABGs, or arterial blood gases

pH [H<sup>+</sup>]

in nanomoles/L

7.52

30

7.70

20

8.00

10

## Acid-base Terminology

**Acidemia:** blood pH < 7.35

Acidosis is a main physiological process that, when it happens on its own, usually results in acidemia. Examples include respiratory acidosis brought on by hypoventilation and metabolic acidosis caused by reduced perfusion (lactic acidosis). The resultant blood pH may be low, normal, or high if the patient also has an alkalosis at the same time.

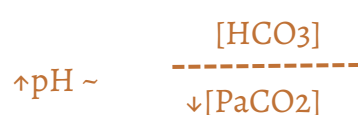
**Alkalemia:** blood pH > 7.45

Alkalosis is a basic physiological process that, when it happens on its own, usually results in alkalemia. Examples include pulmonary alkalosis brought on by sudden hyperventilation and metabolic alkalosis caused by overuse of diuretics. The patient's blood pH may be high, normal, or low as a result if they also have an acidosis.

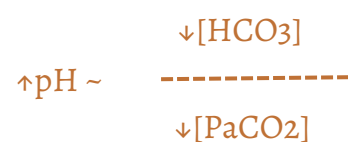
### Respiratory alkalosis

Respiratory alkalosis is a primary condition in which a decrease in PaCO<sub>2</sub> precedes an increase in pH. The kidneys' secondary lowering of bicarbonate (HCO<sub>3</sub>) is compensation (getting the pH back down toward normal), not metabolic acidosis because it is not a main process.

Primary Event



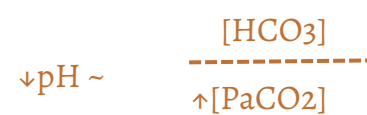
Compensatory Event



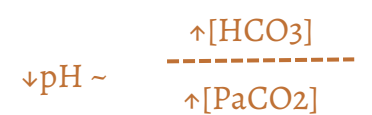
### Respiratory acidosis

Respiratory acidosis is a primary condition in which an increase in PaCO<sub>2</sub> first causes a reduction in pH. The kidneys retain bicarbonate as compensation (to bring pH back up toward normal); this rise of HCO<sub>3</sub><sup>-</sup> is not metabolic alkalosis because it is not a fundamental mechanism.

Primary Event



Compensatory Event



# ABGs, or arterial blood gases

pH [H<sup>+</sup>]

in nanomoles/L

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Primary Event

$$\uparrow \text{pH} \sim \frac{[\text{HCO}_3]}{\downarrow [\text{PaCO}_2]}$$

Compensatory Event

$$\uparrow \text{pH} \sim \frac{\downarrow [\text{HCO}_3]}{\downarrow [\text{PaCO}_2]}$$

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Primary Event

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Compensatory Event

$$\downarrow \text{pH} \sim \frac{\uparrow [\text{HCO}_3]}{\uparrow [\text{PaCO}_2]}$$





# ABGs, or arterial blood gases

## Breathing acidosis

### Risk Factors:

Excess acid in body fluid

Etiology:

Hypoventilation

COPD; Cystic Fibrosis; airway obstruction; spinal cord injury; CVA; depressant drugs; inadequate mechanical ventilation

### Patho:

Hypercapnia; CO<sub>2</sub> diffuses easily across biological membranes

Clinical

Decreased p

>PaCO<sub>2</sub>

HCO<sub>3</sub> is normal or increased in renal compensation

Signs and Symptoms

Vasodilation

Cardiac arrhythmias

Tachycardia

Somnolence & decreased ventilation

## Breathing alkalosis

### Risk Factors:

- pneumonia; shock; relative excess of base in bodily fluids as a result of > ventilatory CO<sub>2</sub> removal;

### Etiology:

In an effort to boost CO<sub>2</sub>, hypoxemia (PaO<sub>2</sub>) causes the rate and depth of breathing to rise.

### Patho:

buffer response is to shift acid from ICF to the blood by moving HCO<sub>3</sub> into the cells in exchange of chloride

>pH; <PaCO<sub>2</sub>; HCO<sub>3</sub> normal or low due to compensation

nausea, vomiting, tingling of fingers



# Blood Transfusion

It is a procedure in which a patient receives a blood product through an intravenous line

## Blood Component

- Whole blood
- Packed cell
- Platelet
- Fresh frozen plasma
- Cryoprecipitate
- Protein solution
- Factor concentrate
- Granulocyte concentration

## Indication of Blood Transfusion

- Major trauma with massive blood loss adults->20% children->10% of their blood volume.
- Major operative procedures minimum acceptable Hb 10g% & Hct 35%
- Preoperatively in cases of chronic anemia requiring surgery.
- Postoperatively if patient becomes severely anemic
- Following severe burn.
- In septicemia.
- Severe hemorrhage from pathological lesion lik cancer, GIT lesions.
- Patients with bleeding disorder. Hemophilia, thrombocytopenia, liver disease.

## Blood Types

- Each person has one of the following blood types: A, B, AB, or O.
  - O can be given to anyone but can only receive O
  - AB can receive any type but can only be given to AB.
- Also, every person's blood is either Rh-positive or Rh-negative
- The blood used in a transfusion must be compatible with the patient's blood type.
  - Type O blood is called the universal donor People with type AB blood are called universal recipients People with Rh-positive blood can get Rh-positive or Rh-negative blood. But people with Rh-negative blood should get only Rh-negative blood. Blood banks collect, test, and store blood.

## PREPARATION

Before a blood transfusion, A technician tests the patient's blood to find out what blood type they have (that is, A, B, AB, or and Rh positive or Rh negative). Some patients may have allergic reactions even when the blood given does work with their own blood type.



# ADMINISTERING BLOOD

Blood transfusions take place in either a doctor's office or a hospital. They can be done at the patient's home, but this is less common. A needle is used to insert an intravenous (IV) line into a blood vessel. Through this line, the blood is transfused. The procedure usually takes one to four hours. The time depends on how much blood is needed, which blood product is given, and whether the patient's body can safely receive blood quickly or not. During the blood transfusion, a nurse carefully watches the patient, especially for the first 15 minutes. This is when bad reactions are most likely to occur. After a blood transfusion, vital signs are checked (such as temperature, blood pressure, respiration rate, and heart rate) Follow-up blood tests may be necessary to show how the body is reacting to the transfusion.

Reaction:Cause	Cinical Signs	Nursing Interventions
<p><b>HEMOLYTIC REACTION:</b> incompatibility between client's blood and donor's blood</p>	<p>Chills, fever, headache, backache, dyspnea, cyanosis, chest pain, tachycardia, hypotension</p>	<ol style="list-style-type: none"> <li>1. Discontinue the transfusion immediately. NOTE: when the transfusion is discontinued, use new tubing for the normal saline infusion.</li> <li>2. Notify primary care provider immediately.</li> <li>3. Monitor vital signs.</li> <li>4. Monitor fluid intake and output.</li> <li>5. Send the remaining blood, bag, filter, tubing, a sample of the client's blood, and a urine sample to the laboratory.</li> </ol>
<p><b>FEBRILE REACTION:</b> sensitivity of the client's blood to white blood cells, platelets, or plasma proteins</p>	<p>Fever, chills, warm and flushed skin, headache, anxiety, muscle pain</p>	<ol style="list-style-type: none"> <li>1. Discontinue the transfusion immediately.</li> <li>2. Give antipyretics as ordered.</li> <li>3. Notify the primary care provider.</li> <li>4. Keep the vein open with a normal saline infusion .</li> </ol>



Reaction:Cause	Cinical Signs	Nursing Interventions
Allergic Reaction (Mild)	Flushing, itching, urticaria, bronchial wheezing	Stop or slow the transfusion, depending on agency protocol. Notify the primary care provider Administer antihistamines as ordered
Allergic Reaction (Severe)	Dyspnea, chest pain, circulatory collapse, cardiac arrest	Stop the transfusion. Keep the vein open with a normal saline solution. Notify the primary care provider immediately. Monitor vital signs. Administer CPR if needed. Administer medications or oxygen as ordered.
<b>CIRCULATORY OVERLOAD:</b> blood administered faster than the circulation can accommodate	Cough, dyspnea, crackles (rales), distended neck veins, tachycardia, hypertension	Place the client upright, with feet dependent. Stop or slow the transfusion. Notify the primary care provider Administer diuretics or oxygen as ordered.
<b>CIRCULATORY OVERLOAD:</b> blood administered faster than the circulation can accommodate	High fever, chills, vomiting, diarrhea, hypotension	Stop the transfusion. Keep the vein open with a normal saline solution infusion Notify the primary care provider Administer IV fluids, Antibiotics Obtain a blood specimen from the client for culture. Send the remaining blood and tubing to the laboratory





# BLOOD PRODUCTS

## A. Packed Red Blood Cells (PRBCs)

Most common type of blood product for transfusion Used to increase the oxygen-carrying capacity of blood Help the body get rid of carbon dioxide and other waste products 1 unit of PRBCs = raises hematocrit by 2- 3%

## Platelets

Also known as thrombocytes Tiny cell structures necessary in blood clotting process Replaces platelets in clients with bleeding disorders, or platelet deficiency 1 unit = increases the average adult client's platelet count by about 5,000 platelets/microliter

## Whole Blood

Not commonly used except for extreme cases of acute hemorrhage Replaces blood volume and all blood products

## Fresh Frozen Plasma (FFP)

Plasma is the liquid component of blood; it has proteins called clotting factors Expands blood volume and provides clotting factors. Contains no RBCs 1 unit of FFP = increases level of any clotting factor by 2-3%

## Albumin and Plasma Protein Fraction

Blood volume expander Provides plasma protein

## Clotting Factors and Cryoprecipitate

A portion of plasma containing certain specific clotting factors Used for clients with clotting factor deficiencies Contains Fibrinogen

## Autologous Red Blood Cells

Used for blood replacement following planned elective surgery Must be donated 4-5 weeks prior to surgery



# NURSING DOSAGE CALCULATION

## Conversions

- 1 mg = 1000 mcg
- 1 g = 1000 mg
- 1 kg = 1000 g
- 1 kg = 2.2 lbs
- 1 oz = 30 m
- 1 ml = 1 c
- 1 L = 1000 m
- 1 tsp = 5 m
- 1 tbsp = 15 ml ( 3 tsp
- 1 cup = 8 ft oz

## Abbreviations

g = gram  
 mg = milligram  
 mcg = microgram  
 kg = kilogram  
 lbs = Pound  
 oz = Ounce  
 ml = milliliter  
 tsp = teaspoon  
 tbsp = tablespoon

## Rounding

Less than 1.0 = round to nearest hundredth.  
 Greater than 1.0 = round to nearest tenth.

## Dimensional Analysis

Determine the unit that you are calculating. (Tablets)  
 Determine the quality available. (1 tablet) Determine the dose available. (300 mg) Determine the desired dose. (600 mg)

$$\frac{\text{Quantity}}{\text{Available dose}} \times \frac{\text{Desired dose}}{X}$$

$$\frac{1 \text{ Tablet}}{300 \text{ mg}} \times \frac{600 \text{ mg}}{X}$$

## Comprehensive:

Please Remember Conversions & Units

- How many milliliter in 9oz (ounce)?

$$\frac{9 \text{ oz}}{1} \times \frac{30 \text{ mL}}{10 \text{ z}} = 270 \text{ mL}$$

- How many micrograms in 30 mg (milligram)?

$$\frac{30 \text{ mg}}{1} \times \frac{1000 \text{ mcg}}{1 \text{ mg}} = 30,000 \text{ mcg}$$

- How many milligram in 10 tsp (teaspoon)?

$$\frac{10 \text{ tsp}}{1} \times \frac{5 \text{ mL}}{1 \text{ tsp}} = 50 \text{ mL}$$

- How many microgram in 0.5 g (gram)?

$$\frac{0.5 \text{ g}}{1} \times \frac{1000 \text{ mg}}{1 \text{ g}} \times \frac{1000 \text{ mcg}}{1 \text{ mg}} = 50,000 \text{ mcg}$$

- How many kilogram in 170 lbs (Pound)?

$$\frac{170 \text{ lbs}}{1} \times \frac{1 \text{ kg}}{2.2 \text{ lbs}} \times \frac{170}{2.2} = 77.3 \text{ kg}$$

## Solid Dose Medication

Order: 0.5mg daily

Supplied: 25 mg/2mL 5  
 tab/dose

$$\frac{0.5 \text{ mg}}{1} \times \frac{1,000 \text{ mcg}}{1 \text{ mg}} \times \frac{1 \text{ tab}}{100} \times \frac{500}{100} = 5$$



## Oral Liquid Medication

Supplied: 25 mg/2mL  
 Order: : 50mg 4 hours  
 0.8 tab/dose

$$\frac{50 \text{ mg}}{1} \times \frac{2 \text{ mL}}{1 \text{ mg}} \times \frac{1 \text{ tab}}{5 \text{ mL}} \times \frac{100}{125} = 0.8$$



# COMPREHENSIVE DOSAGE CALCULATION

## IV Medication:

Order: 1mg IV

Supplied: 0.4 mg/mL

2.5mL

$$\frac{1\text{MG}}{1} \times \frac{1\text{mL}}{0.4\text{mg}} \times \frac{1}{0.4} = 2.5 \text{ ml}$$

## IV Flow Rates: (mL/hr)

Order: 2L (over 48 hours)

42mL/hr

$$\frac{2\text{L}}{48\text{hrs}} \times \frac{1000\text{mL}}{1\text{L}} = \frac{2000}{48} = 41.66$$

## IV Flow Rates: (gtts/min)

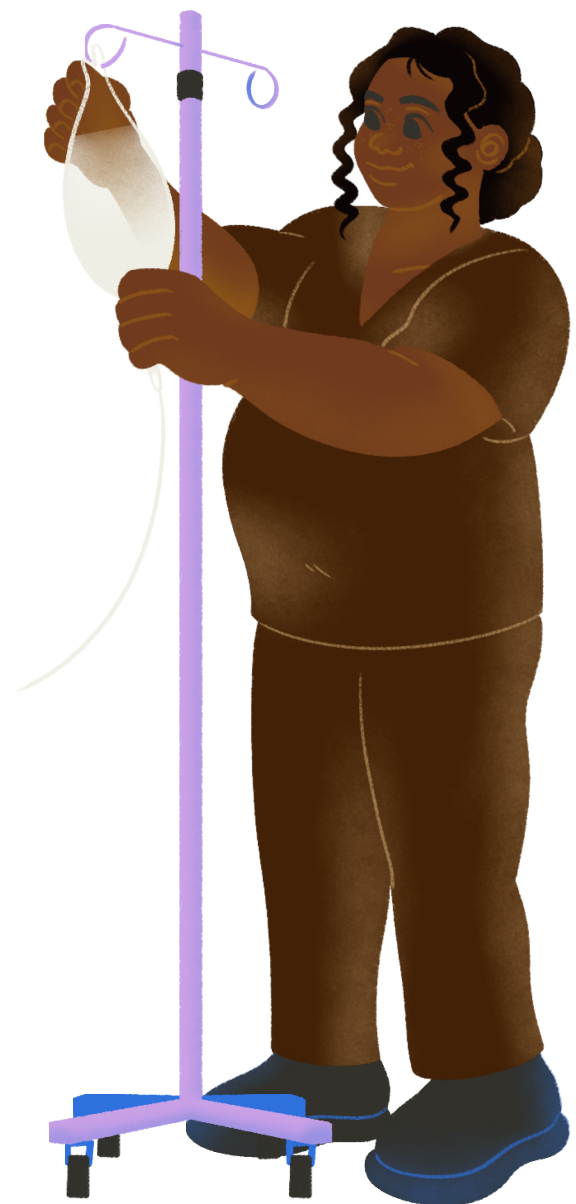
10 drops/mL approx

Order: 2L (over 48 hours)

Drip Factor: 15 gtts/mL

10mL

$$\frac{1\text{hr}}{60\text{min}} \times \frac{2\text{L}}{48\text{hrs}} \times \frac{1000\text{ml}}{1\text{L}} \times \frac{15\text{gtt}}{1\text{ml}} = \frac{30,000}{2,880} = 10.41\text{gtts/min}$$



## Weight Based Calculation

Order: 2mcg/kg/min

Weight: 130 lbs Supplied:

250mg/250mL

$$\frac{130\text{lbs}}{1} \times \frac{1\text{kg}}{2.2\text{lbs}} \times \frac{2\text{mcg/min}}{1\text{kg}} \times \frac{1\text{mg}}{1000\text{mcg}} \times \frac{250\text{mL}}{250\text{mg}} = \frac{65,000}{550,000} = 0.11818\text{mL/min}$$

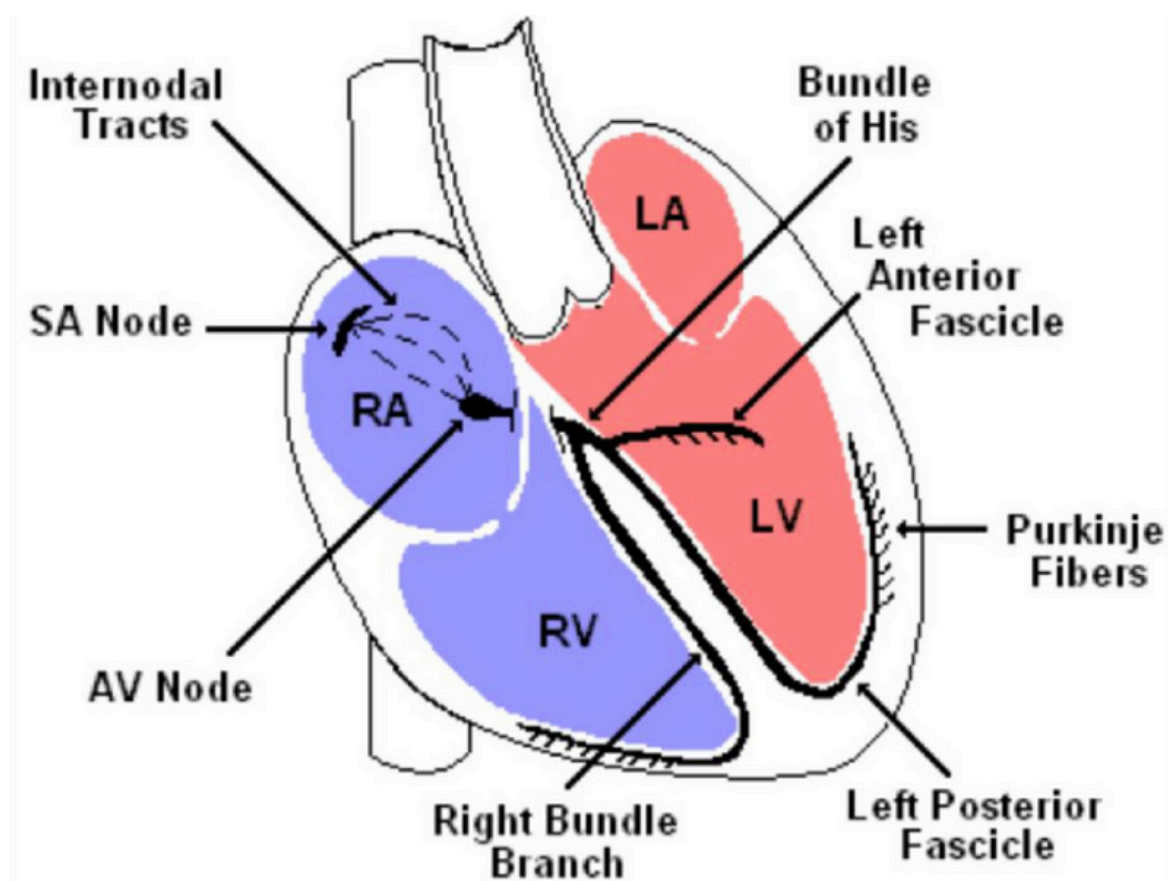
$$\frac{60\text{min}}{1\text{hr}} \times \frac{0.11818}{1\text{min}} = \frac{7.0908}{1} = 7\text{mL/hr}$$



# EKG INTERPRETATION FOR NURSES

## HEART STRUCTURE

- Four total chambers
- Two small chambers known as atria
- Force blood into larger chamber
- Located at the top of the heart
- Two large chambers known as ventricles
- Force blood to the lungs and the body
- Located at the bottom of the heart
- Chambers separated by walls and valve
- Coordinated contraction moves blood in the proper direction



## ELECTRICAL CONDUCTION

contraction is triggered by an electrical signal  
Beginning in the right atrium is the contractile signal  
through the atria and arrives at the ventricle  
Nodes set the pace  
via ventricles while following nerve fiber  
ensures that all of the cells in a chamber contract  
together by moving quickly between them





## EKG WAVES

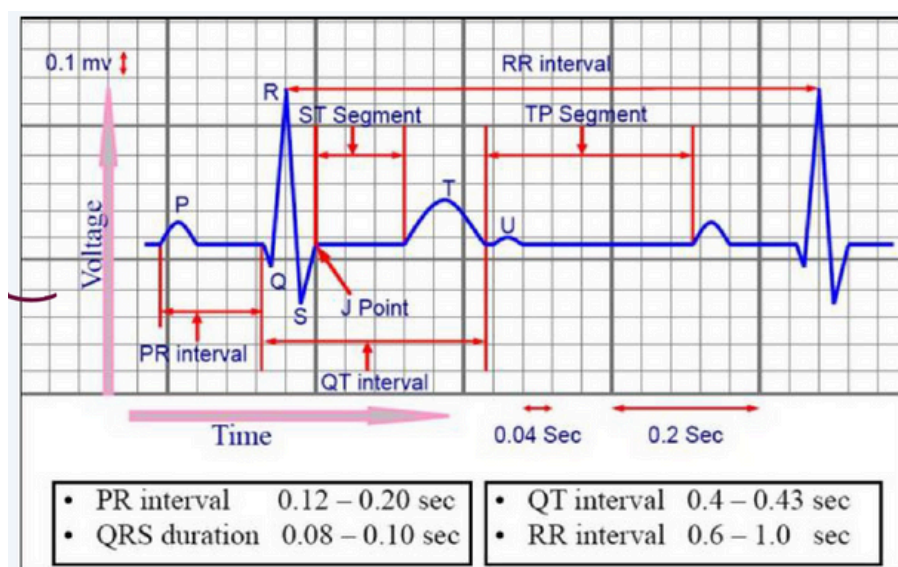
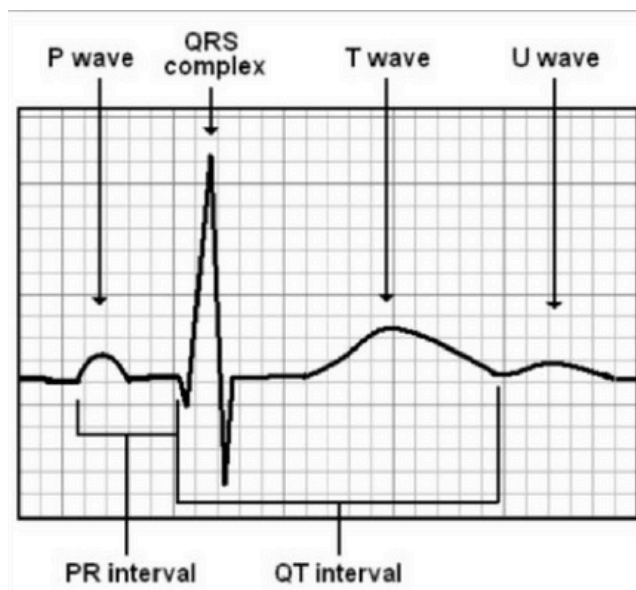
- P wave = atrial depolarization
- QRS complex = ventricular depolarization
- T wave = ventricular repolarization
- Cycle repeats 60 – 100 times per minute
- Each cycle is one complete cardiac contraction
- Abnormalities may indicate disease

## EKG INTERVALS

- Distances between waves
- Used to evaluate conduction
- Most common are PP, RR, QT, QR
- Waves that are too short or too long may be a sign of cardiac disease
- Must be evaluated by trained physician

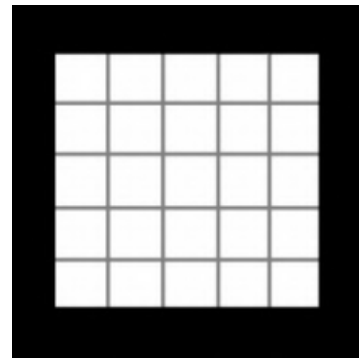
## WAVEFORMS AND INTERVALS

Vertical Axis = Voltage  
 1- Vertical axis represents voltage on the EKG  
 2- One small box (1 mm) represents 0.10 mV



### The ECG Paper

Horizontally  
One small box - 0.04s  
One large box - 0.20s Vertically  
One large box - 0.5 mV



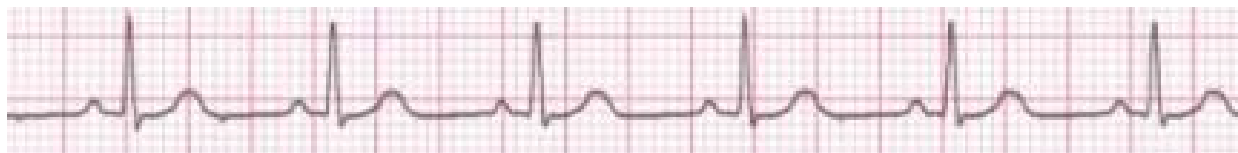
### The ECG Paper

A vertical line is indicated every three seconds for 15 substantial boxes.  
This aids in determining heart rate.  
NOTE: The next strips are all 6 seconds long but are not indicated.

### Rhythm Analysis

- Step 1: Calculate rate.
- Step 2: Determine regularity.
- Step 3: Assess the P waves.
- Step 4: Determine PR interval.
- Step 5: Determine QRS duration.

### Step 1: Calculate Rate



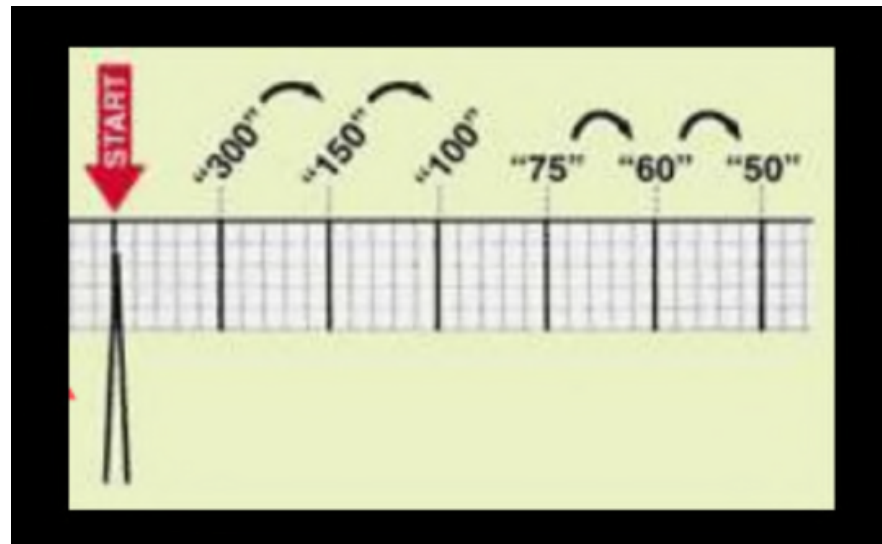
Option 1: Add 10 to the number of R waves in a rhythm strip lasting six seconds.

Interpretation?

$$9 \times 10 = 90 \text{ bpm}$$



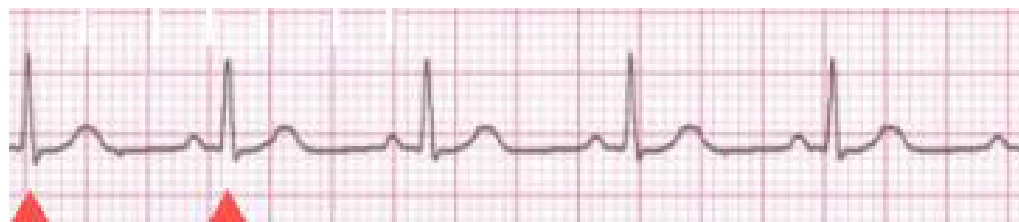
Step 1: Calculate Rate



Choice 2 Look for a R wave that touches a bold line.

Count how many big boxes there are until the next R wave. If the second R wave is one huge box away, the rate is 300, two boxes away, 150, three boxes away, 100, four boxes away, etc. (cont)

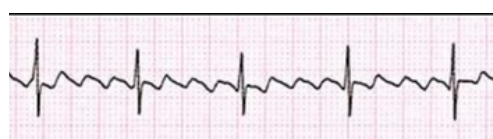
Step 1: Calculate Rate



Interpretation?

Approx. 1 box less than 100 = 95 bpm

What is the heart rate?



## Step 2 : Determine Regularity

Regular: If the ECG's greatest R-R interval and smallest R-R interval differ by less than 0.12 seconds.

Irregular: If the difference between the longest R-R interval in the ECG and the shortest R-R interval is greater than 0.12 second



Using a caliper or markings on paper using a pen, check the R-R distances.

Interpretation?

Regular

Assess the P waves



Are P waves present? Do all P waves resemble one another? Are the P waves happening regularly? Does each QRS have a P wave preceding it?

Interpretation?

Normal P waves with 1 P wave for every QRS.

Determine PR interval

Normal: 0.12 - 0.20 seconds. (3 - 5 boxes)

Interpretation?

0.12 seconds





### QRS duration



Normal: 0.04 - 0.12 seconds. (1 - 3 boxes)

Interpretation?

0.08 seconds

### Rhythm Summary



Rate	90-95 bpm
Regularity P	regular
waves PR	normal
interval QRS	0.12
duration	s 0.08 s

Interpretation?

Normal Sinus Rhythm

## Normal Sinus Rhythm



P waves	90-95 bpm
Configurations PR	Normal Shape
Interval	Check Table Above
Rhythm	Regular or Irregular
Atrial	Regular
Ventricular	Regular

Rate	90-95 bpm
Atrial	Normal Shape
Ventricular	Same as Atrial
QRS Width	Check Table Above
T Wave	Present
QT Interval	Check Table Above

## Sinus Bradycardia



## Sinus Tachycardia



## Atrial Fibrillation



P waves	
Configurations	Fibrillatory waves
PR Interval	Indeterminate
Rhythm	Regular or Irregular
Atrial	Regular
Ventricular	Regular

Rate	
Atrial	400 - 600 Often unable to
Ventricular	determine 60 - 100
QRS Width	0.06 - 0.10 Seconds
T Wave	Often absent
QT Interval	Difficult to discern due to F wave interruption

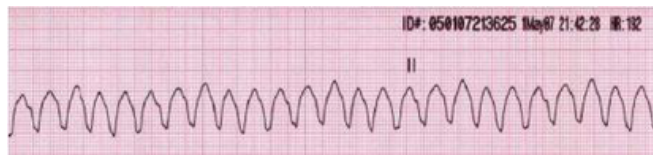
## Atrial Flutter



P waves	
Configurations	Flutter waves
PR Interval	Indeterminate
Rhythm	Regular or Irregular
Atrial	Regular
Ventricular	Regular

Rate	
Atrial	300 (250 - 350)
Ventricular	60 - 150
QRS Width	Normal
T Wave	Flutter waves
QT Interval	Interrupted by Flutter waves

## Ventricular Tachycardia



P waves	90-95 bpm Normal If
Configurations PR Interval	Present Varies/ AV dissociation
Rhythm	Regular or Irregular
Atrial	Regular if visible
Ventricular	Usually Regular

Rate	
Atrial	Normal If visible
Ventricular	100 - 170
QRS Width	Wide
T Wave	Often difficult to distinguish
QT Interval	No relevant

## Ventricular Fibrillation



P waves	90-95 bpm Not
Configurations	identifiable
PR Interval	Indeterminate

Rate	
Atrial	Not identifiable
Ventricular	QRS complex not identifiable

Rhythm	Regular or Irregular
Atrial	If identifiable
Ventricular	Irregular

QRS Width	Wide and bizarre
T Wave	Not identifiable
QT Interval	

## First Degree AV Block



P waves	90-95 bpm
Configurations	Normal
PR Interval	Constant
Rhythm	Regular or Irregular
Atrial	Regular
Ventricular	Regular

Rate	90-95 bpm
Atrial	300 (250 - 350)
Ventricular	Same as atrial
QRS Width	Normal
T Wave	Present
QT Interval	Normal

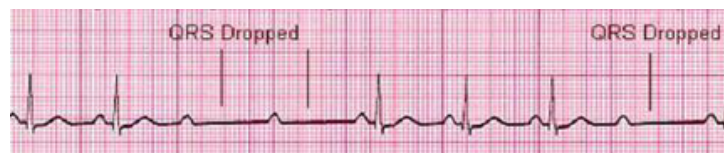
## 2nd Degree AV Block Type 1



P waves	90-95 bpm
Configurations	Normal
PR Interval	Varies before every QRS
Rhythm	Regular or Irregular
Atrial	Regular if visible
Ventricular	Irregular

Rate	90-95 bpm
Atrial	Normal If visible
Ventricular	Normal for age group
QRS Width	Normal
T Wave	Normal
QT Interval	Normal

## 2nd Degree AV Block Type 2



P waves	90-95 bpm
Configurations	Normal
PR Interval	Normal

Rate	90-95 bpm
Atrial	Not identifiable
Ventricular	QRS complex not identifiable

Rhythm	Regular or Irregular
Atrial	Regular
Ventricular	Regular If p to QRS ratio otherwise irregular

QRS Width	Normal
T Wave	Present
QT Interval	Normal



3rd Degree AV Block



P waves	90-95 bpm
Configurations	Normal
PR Interval	Varies
Rhythm	Regular or Irregular
Atrial	Regular
Ventricular	Regular

Rate	90-95 bpm
Atrial	Normal
Ventricular	Slower than atrial rate
QRS Width	Narrow
T Wave	Normal
QT Interval	Normal



# Fluid and Electrolyte Imbalance

## Fluid

Aid in keeping cell structure and body temperature stable. transports trash, gases, and nutrients

## Fluid

Relationships between age and sex and total body water as a percentage of body weight

Age	Male	Female
UNDER 18	65 %	55 %
18-40	60 %	50 %
40-60	50-60 %	40-50 %
OVER 60	60 %	50 %

## Fluid Distribution

Weight	70KG	100%
BODY WATER	42 L	60 %
INTRACEL LULAR FLUID (ICF)	28 L	40 %
EXTRACEL LULAR FLUID (ECF)	14 L	20 %
PLASMA VOLUME (PV)	3.5 L	5 %

## Fluid Imbalance

The sodium balance is affected by changes in ECF volume

The sodium/water ratio will change, resulting in either hypo- or hyperosmolarity

Fluid imbalance loss brought on by an excess or deficiency of fluid

Not everyone will find the same pathophysiologic variation to be essential, as is the case with many clinical diseases

Consider two individuals who experience nausea and vomiting as a result of the same viral disease.

## Fluid Volume Disturbances

It is a fast transition from one body fluid compartment to another or an abnormal drop or increase in fluid volume.

1-Hypovolemia

2-Hypervolemia

## Hypovolemia

### Clinical Manifestation

- One-day weight loss
- Oliguria
- Low BP
- Dark eyes
- Dizziness
- Weakness
- Lessening of skin turgor
- Concentrated urine



## Treatment/Intervention

### Fluid Management

Oral rehydration therapy: glucose and electrolyte solutions. such as Pedialyte and Rehydralyte.

The kind of fluid ordered for IV therapy depends on the client's cardiovascular health and the degree of dehydration present.

Mild to severe dehydration treated with diet. Replace lost oral fluids to be accurate.

Every eight hours at the absolute least, if not hourly, fluid levels should be monitored and measured. keeping a daily weight log monitoring vitals Watch out for a weak, rapid pulse and orthostatic hypotension. To determine urine concentration, use urine specific gravity. Check the moisture content of your oral and mucous membranes.

## Fluide Volume Excess

### Common Causes:

Congestive Heart Failure  
Early renal failure  
IV therapy  
Excessive sodium ingestion  
SIADH  
Corticosteroid

## Clinical Manifestation

### Signs/Symptoms

Increased BP  
Weight gain  
Bounding pulse  
Venous distention  
Pulmonary edema

## Nursing Management

Every eight hours at the absolute least, if not hourly, fluid levels should be monitored and measured. keeping a daily weight log monitoring vitals Watch out for a weak, rapid pulse and orthostatic hypotension. To determine urine concentration, use urine specific gravity. Check the moisture content of your oral and mucous membranes.

## Medical Management

Pharmacological therapy Diuretics such as thiazide diuretics and loop diuretics  
A specific class of thiazide diuretic is hydrochlorothiazide. Loop diuretics include furosemide and torsemide. additional potassium

## Nursing Management

Frequently check the I/O chart to identify cases of excessive fluid retention Patients who are at risk have their breath sounds periodically checked, particularly if parenteral hydration is being administered. The body's most dependent regions, such the feet and ankles, should have the least amount of edema.

## Controlling Hypervolemia

Finding FVE early is essential in IF to prevent it from getting worse. Examples of interventions include encouraging relaxation, reducing salt intake, monitoring parenteral fluid therapy, and administering the appropriate medications. Regular rest periods may be beneficial since bed rest encourages fluid diuresis.



# Electrolyte Imbalance

## Electrolytes in Body Fluids

Normal value	
Sodium (Na <sup>+</sup> )	35-145 mEq/L
Potassium (K <sup>+</sup> )	3.5-5.0 mEq/L
Ionized Calcium (Ca <sup>++</sup> )	4.5-5.5 mEq/L
Calcium (Ca <sup>++</sup> )	8.5-10.5 mEq/L
Bicarbonate (HCO <sub>3</sub> )	24-30 mEq/L
Chloride(Cl <sup>-</sup> )	95-105 mEq/L
Magnesium (Mg <sup>++</sup> )	1.5-2.5 mEq/L
Phosphate (PO <sub>4</sub> <sup>--</sup> )	2.8-4.5 mEq/L

# Sodium

## Hyponatremia

Hyponatremia indicates a relative excess of water in relation to sodium and is typically defined as a serum sodium level below 135 mEq/L. Hyponatremia is the most frequent electrolyte disorder. Acute hyponatremia (developing over 48 hours or less) is linked to more severe levels of cerebral edema. If the sodium level is below 105 mEq/L, mortality is greater than 50%. Milder brain impairment is seen in people with persistent hyponatremia (developing over more than 48 hours).

## Hypernatremia

Hypernatremia is often brought on by a lack of water. Etiology: water loss that is too great, such as that caused by heat exposure or diabetes insipidus. Patients with primary hypodipsia and those in a coma both have diminished thirst. remarkable Na<sup>+</sup> retention



## Hyponatremia

## Hypernatremia

### PHARMACY MANAGEMENT

Fix the hyponatremia by determining its root cause. If the client suffers hyponatremia as a result of consuming too much fluid, fluid intake will be restricted so that the salt level can balance. If the serum sodium level falls below 125 mEq/L, sodium replacement is necessary.

### THE MANAGEMENT OF PHARMACOLOGIES

For individuals with moderate hyponatremia, a prescription for lactated Ringer solution or 125 meq/L I/V saline solution (0.9% NaCl) may be given. When the serum sodium content is 115 meq/L or below, a concentrated saline solution, such as 3 percent sodium chloride, is advised.

### HEALTHCARE INTERVENTIONS

Keep tabs on the client's cardiovascular, cerebral, neuromuscular, gastrointestinal, and renal health. When both hypovolemia and hyponatremia are present, IV sodium chloride infusions are administered to restore both salt levels and fluid volume.

### DIETARY MANAGEMENT

Eat less salt.

# Potassium

## Hyponatremia

## Hypernatremia

Alkalosis results in increased renal  $K^+/H^+$  excretion, while hypokalemia is defined as a blood potassium level of less than 3.5 mEq/L.

### SIGNS & SYMPTOMS:

CVS: flatten T waves, depressed ST segments  
GI: paralytic ileus  
Muscular: weakness - flaccid paralysis,  
diminished to absent tendon reflexes

### MEDICAL MANAGEMENT

Determining & correcting the cause of the imbalance. Extreme hypokalemia requires cardiac monitoring.

Hyperkalemia is defined as potassium levels greater than 5.0 mEq/L. ETIOLOGY

Potassium retention can be brought on by renal insufficiency, renal failure, decreased urine output, and potassium-sparing diuretics. Overreleasing of potassium in cells results in severe traumatic injury, acidosis of the metabolism, severe infections, and severe burns. IV infusions that are too frequent or oral potassium intake.





Hyponatremia

Hypernatremia

PHARMACOLOGICAL MANAGEMENT

Oral potassium replacement therapy is usually advised for mild hypokalemia. A glass of water, juice, or food must be consumed together with the prescription because potassium severely irritates the gastrointestinal mucosa. Potassium chloride can be administered intravenously for moderate or severe hypokalemia; it must first be diluted in IV fluids. The intravenous injection of potassium may result in cardiac arrests. Potassium can be given to a patient wearing a cardiac monitor at quantities of 10 to 20 mEq/hour diluted in IV fluid. High potassium amounts can irritate heart muscle. Therefore, resolving a potassium deficit can take several days.

DIETARY MANAGEMENT

The delivery of potassium-rich foods aids in both fixing the issue and stopping further potassium losses.

MEDICAL MANAGEMENT

Restrict potassium consumption when the serum potassium level is between 5.0 and 5.5 mEq/L. If metabolic acidosis is the cause of the excess potassium, treating the acidosis with sodium bicarbonate encourages the uptake of potassium into the cells. Raised serum potassium levels are decreased by increasing urine production.

DIETARY MANAGEMENT

Rapid action is required when hyperkalemia is severe in order to avert major heart problems. Delivering low-potassium foods helps to resolve the problem and avoid further potassium overconsumption.

# Calcium

Hyponatremia

Hypernatremia

Serum calcium <8.5 mg/dL

CLINICAL MANIFESTATION

Positive Chvostek's and Trousseau's signs, numbness and tingling in the fingers, toes, and circumoral region, irritability, bronchospasm, anxiety, a slowed clotting time, increased prothrombin, and abnormalities in the QT and ST segments of the ECG are some symptoms to look out for.

Serum calcium >10.5 mg/dL

CLINICAL MANIFESTATION

Muscle weakness is characterized by calcium stones, flank pain, pathologic fractures, anorexia, constipation, nausea, vomiting, polyuria, and hypoactive deep tendon reflexes. ECG: bradycardia, cardiac obstructions, and a shortened QT interval



Hyponatremia	Hypernatremia
<p><b>CAUSES</b></p> <p>Following thyroid surgery or radical neck dissection, a number of conditions can develop, including malabsorption, pancreatitis, alkalosis, vitamin D deficiency, severe subcutaneous infection, generalized peritonitis, massive transfusion of citrated blood, chronic diarrhea, decreased parathyroid hormone, and diuretic phase of renal failure.</p>	<p><b>CAUSES</b></p> <p>There are several conditions that can develop, including malignant neoplasm, hyperparathyroidism, prolonged immobility, excessive calcium supplementation, excessive vitamin D intake, oliguric phase of renal failure, acidosis, corticosteroid therapy, use of thiazide diuretics, elevated parathyroid hormone, and digoxin toxicity.</p>

# Magnesium

Hyponatremia	Hypernatremia
<p>Serum magnesium &lt;1.8 mg/dL</p> <p><b>CLINICAL MANIFESTATION</b></p> <p>Neuromuscular irritability, positive Trousseau's and Chvostek's signs, insomnia, mood changes, anorexia, vomiting, increased tendon reflexes, and ↑ BP. ECG: PVCs, flat or inverted T waves, depressed ST segment</p> <p><b>CAUSES</b></p> <p>Chronic alcoholism, hyperparathyroidism, hyperaldosteronism, diuretic phase of renal failure, malabsorptive disorders, diabetic ketoacidosis, refeeding after starvation, parenteral nutrition, chronic use of laxatives, diarrhea, acute myocardial infarction, heart failure, decreased serum K<sup>+</sup> and Ca<sup>++</sup>, and some pharmaceutical drugs (including gentamicin, cisplatin, and cyclosporine).</p>	<p>Serum magnesium &gt;2.7 mg/dL</p> <p><b>CLINICAL MANIFESTATION</b></p> <p>Flushing, hypotension, lethargy, slow breathing, hypoactive reflexes, cardiac arrest and coma, and diaphoresis are all symptoms. Tachycardia, bradycardia, a lengthy PR interval, and a protracted QRS on the ECG.</p> <p><b>CAUSES</b></p> <p>The oliguric phase of renal failure (particularly when magnesium-containing medications are utilized), DKA, adrenal insufficiency, excessive IV magnesium delivery, etc.</p>



# Phosphorus

## Hyponatremia

Serum phosphorus <2.5 mg/dL

### CLINICAL MANIFESTATION

muscular weakness, bone pain and soreness, chest discomfort, disorientation, cardiomyopathy, respiratory failure, convulsions, tissue hypoxia, and heightened susceptibility to infection are all symptoms of paresthesias.

### CAUSES

Parenteral nutrition may be necessary in cases of refeeding after hunger, alcohol withdrawal, burns, acid-base disorders, diabetic ketoacidosis, pulmonary alkalosis, magnesium, potassium, hyperparathyroidism, vomiting, diarrhea, and hyperventilation.

## Hypernatremia

Serum phosphorus >4.5 mg/dL

### CLINICAL MANIFESTATION

tetany, rapid heartbeat. Hypocalcaemia signs and symptoms include anorexia, nausea, and muscle weakness.

### CAUSES

Acute and chronic renal failure, high phosphorus intake, excessive vitamin D intake, respiratory acidosis, hypoparathyroidism, volume depletion, cytotoxic leukaemia/lymphoma treatment, rapid tissue deterioration, and rhabdomyolysis are all risk factors for kidney failure.

# Chloride

## Hyponatremia

Serum chloride >108 mEq/L

### CLINICAL MANIFESTATION

- Tetany, tremors, cramping in the muscles, tremor-like motions, hyperactive deep tendon reflexes, seizures, dysrhythmias, and coma Serum chloride, sodium, pH, bicarbonate, total carbon dioxide content, and chloride levels in the urine are among the laboratory results.

## Hypernatremia

Serum chloride <96 mEq/L

### CONSIDERABLE MANIFESTATION

Low cardiac output, tachypnea, lethargy, weakness, deep, rapid breathing, loss of cognitive function, dyspnea, tachycardia, pitting edema, dysrhythmias, and coma are some of the symptoms that might occur. According to test results, there are high levels of serum chloride, sodium, pH, bicarbonate, and urine chloride. There is also a normal anion gap.

## Hyponatremia

### CAUSES

excessive sodium chloride infusions with water loss, head injury (sodium retention), hypernatremia, renal failure, corticosteroid use, dehydration, severe diarrhea (loss of bicarbonate), respiratory alkalosis, diuretic administration, salicylate overdose, Kayexalate overdose, acetazolamide overdose, phenylbutazone overdose, ammonium chloride overdose, hyperparathyroidism, metabolic acidosis.

## Hypernatremia

### CAUSES

Reduced chloride intake or absorption, Addison's disease, untreated diabetic ketoacidosis, chronic respiratory acidosis, excessive sweating, vomiting, gastric suction, diarrhea, sodium and potassium deficiency, metabolic alkalosis, use of loop, osmotic, or thiazide diuretics, excessive bicarbonate use, rapid removal of ascitic fluid with a high sodium content, intravenous fluids devoid of chloride (d



# HEAD TO TOE ASSESSMENT

## LEVEL OF CONSCIOUSNESS

- AWAKE
- RESTLESS
- ALERT
- DROWSY
- SEDATED
- CONFUSED

## VITALS SIGN

- OXYGEN SATURATION
- PULSE
- BP
- TEMPERATURE
- RESPIRATION

## MENTAL STATE

- CALM
- PLEASANT
- ANXIOUS
- COOPERATIVE
- UN-COOPERATIVE
- RESTLESS
- WITHDRAWN
- ANGRY/AGITATED

## PAIN

YES/NO

LOCATION \_\_\_\_\_

INTENSITY

QUALITY

ALLEVIATING FACTORS: AGGRAVATING

FACTORS: DURATION/FREQUENCY:

## ORIENTATION

- PERSON
- PLACE
- TIME
- SITUATION

## NOSE

- CONGESTION
- SNEEZING
- LESIONS
- MIDLINE
- SKIN INTAKE
- SYMMETRICAL
- OTHER

## MOUTH

- SOFT
- DRY
- MOIST
- MIDLINE
- PINK
- OTHERS

## EARS

- SYMMETRICAL
- LESIONS \_\_\_\_\_
- SKIN INTAKE \_\_\_\_\_
- EAR WAX \_\_\_\_\_
- HEARING DEVICE

## ABNORMAL FINDINGS

- PINPOINT
- UNEQUAL R>L OR L>R
- FIXED

## ABNORMAL DISCHARGE

YES OR NO INVOLUNTARY

MOVEMENT

## COMMUNICATION

- VERBAL
- MOUTH WORDS
- WRITE NOTES
- NODS HEAD TO YES/NO QUESTION



# HEAD TO TOE ASSESSMENT

## ABDOMEN

### Inspection

- SYMMETRICAL
- ROUNDED
- OTHERS
- OTHER

### Sclera

- RLQ: ACTIVE/HYPERACTIVE/ABSENT
- RUQ: ACTIVE/HYPERACTIVE/ABSENT
- LUQ: ACTIVE/HYPERACTIVE/ABSENT
- LLQ: ACTIVE/HYPERACTIVE/ABSENT

### Palpation

- SOFT
- DISTENDED
- TENDER
- FLAT
- FIRM
- RIGID
- HARD
- GUARDING PAIN

## HAIR

- CLEAN
- DIRTY
- THICK
- HAIR LOSS

## FACE

### Conjunctiva

- PINK
- MOIST
- INTACT
- OTHER

### Sclera

- WHITE
- INTACT
- OTHER

### Perrla

- ROUND
- EQUAL
- REACTIVE TO LIGHT
- ACCOMODATING

## SKIN

TEMPERATURE MOISTURE TURGOR

COLOR \_\_\_\_\_

PRESSURE ULCER \_\_\_\_\_

WOUND \_\_\_\_\_

## CHEST

- |                                      | Breath Sound                       | Respiration                                   | Heart Sound     | Rhythm            |
|--------------------------------------|------------------------------------|---|-----------------|-------------------|
| <input type="checkbox"/> SYMMETRICAL | <input type="checkbox"/> CLEAR     | <input type="checkbox"/> REGULAR              | NORMAL/DISTINCT | REGULAR           |
| <input type="checkbox"/> ROUND       | <input type="checkbox"/> DECREASED | <input type="checkbox"/> IRREGULAR            | DISTANT         | IRREGULAR         |
| <input type="checkbox"/> OTHERS      | <input type="checkbox"/> CRACKLES  | <input type="checkbox"/> UNLABORED            | MUFFLED         | APICAL HEART RATE |
|                                      | <input type="checkbox"/> ABSENT    | <input type="checkbox"/> DEEP                 | GALLOP          | -----             |
|                                      | <input type="checkbox"/> WHEEZING  | <input type="checkbox"/> ACCESSORY MUSCLE USE | EXTRA SOUND     | BEAT PER MIN      |
|                                      |                                    | <input type="checkbox"/> SHALLOW              |                 |                   |





# HEAD TO TOE ASSESSMENT

## UPPER EXTREMITIES

SHOULDER SHRUG: STRONG/WEAK/UNABLE

GRIP STRENGTH: \_\_\_\_\_

RANGE OF MOTION: \_\_\_\_\_

CAPILLARY REFILL: \_\_\_\_\_

RADIAL PULSE: \_\_\_\_\_

## LOWER EXTREMITIES

PEDAL PUSH: STRONG/WEAK/UNABLE

RANGE OF MOTION: \_\_\_\_\_

CAPILLARY REFILL: \_\_\_\_\_

EDEMA: \_\_\_\_\_

DORSALIS PEDIS PULSE: \_\_\_\_\_

POSTERIOR TIBIAL PULSE: \_\_\_\_\_

Nursing assessment is an important tool for nurses in nursing diagnosis, It is called base of foundation in nursing process.

I am concluding some important points which will help you to correctly diagnose. Following are some Key Points

# Physical Assessment

## Integument

- Skin: The client's skin is consistent in color, free of blemishes, and smells sweet. He has healthy skin turgor and a normal range for skin temperature.
- Hair: The customer has thick, silky hair that is uniformly spaced out and varying amounts of body hair. Additionally, no evidence of infection or infestation has been found
- The client's nails are light brown and have a convex curve in their shape. It is smooth and the epidermis is still present. Nails revert to their normal color in less than 4 seconds when pushed between the fingers (Blanch Test).

## Head

- Head: The customer has a rounded, symmetrical, normocephalic head.
- When the skull is palpated, there are no nodules, masses, or depressions.
- Face: The client's face appeared uniformly smooth, without any nodules or lumps, and with consistent consistency.

## Ears and Hearing

- Ears: His symmetrical auricles match the skin tone on his face and are the same color. The auricles and the outer canthus of the eye are in line. The auricles are movable, firm, and not delicate when feeling for texture. Folding causes the pinna to rebound. During the assessment of Watch tick test, the client was able to hear ticking in both ears.



# Physical Assessment

## Eyes and Vision

- Eyebrows: The hair is distributed equally. When requested to lift and lower their eyebrows, the client's symmetrically aligned brows made an equivalent amount of movement.
- Eyelashes: The eyelashes had an even distribution and a modest outward curl.
- Eyelids: There were no discharges, no discoloration, and the lids closed symmetrically with 15-20 unconscious blinks a minute
- The Bulbar conjunctiva was translucent and had few visible capillaries.
- The sclera seemed to be white. The palpebral conjunctiva was pink, lustrous, and smooth.
- The lacrimal gland is not torn or edematous
- The iris's finer characteristics can be seen through the translucent, glossy, and smooth cornea.
- When the cornea was touched, the customer blinked. The eyes have identically sized, black pupils. The iris is round and flat. Pupils with and without illumination constrict according to the PERRLA (pupils equally round response to light accommodation) principle.
- When viewing a close item, the pupil contracts; when viewing a distance object, it dilates. When the object is moved closer to the nose, the pupils congregate.
- The client must be able to see peripheral objects when looking straight ahead when assessing the peripheral vision field.
- The client's two eyes moved parallel to one another and in synchrony when the extraocular muscle was tested.
- The client could read the newspaper held at a 14-inch distance.

## Nose and Sinus

- Nose: The nose appeared symmetric, straight and uniform in color. There was no presence of discharge or flaring. When lightly palpated, there were no tenderness and lesions

## Mouth

- The client's lips are smooth, symmetrical, and evenly pink. They are also moist.
- When requested to whistle, the customer was able to purse his lips.
- Gums and Teeth: There is no enamel discoloration, no gum recession, and the gums are a pinkish tint. The client's buccal mucosa was consistently pink, moist, velvety, shining, and had an elastic structure.
- The client's tongue is in the middle of the mouth. It is wet, pink in color, and just a little bit gritty. There is a thin, yellowish covering present
- The hard palate has a more uneven texture than the smooth palate, which is pale pink and silky.
- The client's uvula is situated in the center of the soft palate.

## Neck

- The muscles of the neck are of equal size. The patient moved her head in a coordinated, pain-free manner.
- The client's lymph nodes are not palpable.
- In the middle of the neck is where the trachea is located. Inspection reveals no thyroid gland, and swallowing causes the glands to climb, although they are not visible.



# Physical Assessment

## Thorax, Lungs, and Abdomen

- Lungs/Chest: The chest wall is unharmed and free of masses and soreness. When checking for the respiratory excursion, there is a full and symmetrical expansion and the thumbs separate by 2-3 cm after deep inhalation. The individual displayed calm, regular, and effortless breathing. Vertical alignment refers to the spine. The hips and shoulders on the right and left are equal in height. Heart: The aortic and pulmonic regions did not appear to be pulsating. Heaves and lifts are not present
- Abdomen: The client's abdomen is uniform in color and has smooth skin. The curve of the abdomen is symmetrical. As the client breathed, symmetrical movements were triggered. There are no jugular veins can be seen. Nails return after being pushed between the fingers (Blanch Test)

## Extremities

- The length and size of the extremities are symmetrical.
- Muscles: In the absence of tremors, the muscles are not discernible. Normally stiff, they displayed fluid, synchronized motions.
- Bones: Deformities, soreness, or swelling of the bones were not present. Joints: There was no edema or pain, and they moved easily.



# IV THERAPH

The fastest approach to administer drugs, fluid replacement, and blood products to all parts of the body is intravenously. Due to the fact that the circulatory system transports the product, it is regarded as the quickest method. Intravenous therapy can be used for blood transfusion, electrolyte balance correction, fluid replacement (such as treating dehydration), and pharmaceutical delivery.

## MEDICAL INDICATIONS FOR IV

Fluid and electrolyte balance  
Medications  
Bolus injectio  
Blood/blood product  
Anesthesia  
Nutrition/CPN/TPN  
Testing/Diagnostic reagents

## EQUIPMENT IDENTIFICATION

Gloves  
Tourniquet  
J-Loop  
Saline flush  
Needles  
Tegaderm Tape & Chloraprep  
Gauze 2x  
Needle box

## TIPS FOR BEST RESULTS

Always use two patient identifiers. Obtain a doctor's order for IV Wash hands prior to and after procedure. Wear protective gear: gloves, gowns, goggles, face shields  
Perform one or two attempts to place the IV Always ask for assistance if needed.

## Pre-Assessment Considerations

It's important to consider the type of infusion ordered and the required therapeutic time. Always take into account the health and medical history of the patient. Here are some for instance, scars from surgery or fistulas; tattoos; strokes; or paralysis



# STEPS FOR IV INSERTION

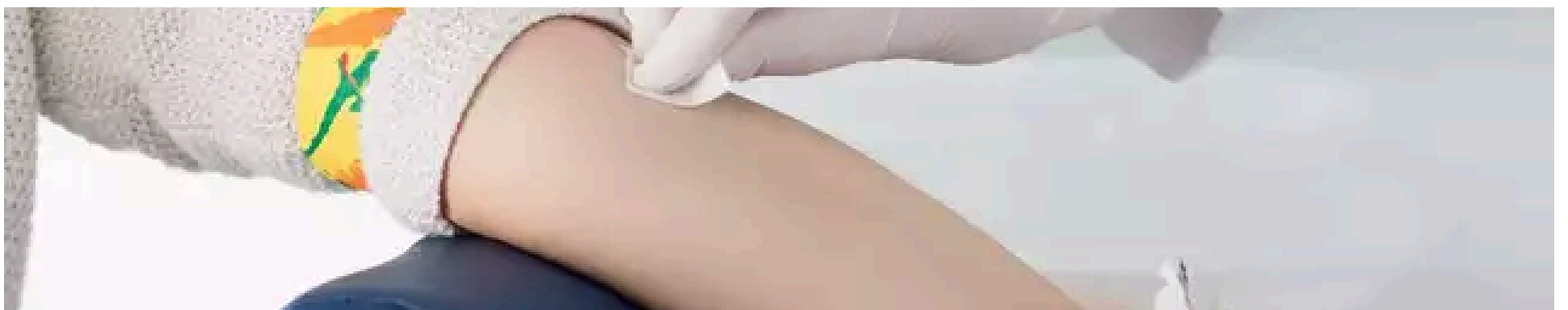
## CHECK LIST ITEM DESCRIPTION

- Check the doctor's order. Hands are washed before and after Identify Patient and Describe Intention Gloves, Don affix a tourniquet. Check the finest vein in the arm Prepare the tools Choose a catheter Choose a catheter before inserting the tourniquet, apply vein traction Patient Warn Insert Correctly. Watch the blood flash Lower catheter Improved needle Untie the tourniquet
- Compress the area to stop the blood flow needle remova
- Add an extension cord. Clean up the connector. evaluate the state of patency Put away sharp
- clothing, and use a secure site.

## RATIONALE

- Consistently seek order Right Patient Caregiver Role: Hand Hygiene Personal protective equipment facilitates vein visualization; always evaluate
- Be ready and eager to begin. Size counts
- Aseptic Method just prior to the operation
- Protect the vein stops rolling just 1–2 communication attempts, You are a fool. To make sure you are in the vein, move forward. Please your patient. Halt the flow of blood For safety, release the needle's pressure. Access to connect medications sterile method
- Make sure you are inside the boat by checking. Dressing for safety and securing

# SCRUB THE SITE FOR 30 SECONDS



## COMPLICATIONS OF IV THERAPY

INFILTRATIO  
PHLEBITIS  
FLUID OVERLOAD  
INFECTION  
AIR EMBOLISM  
SPEED SHOCK

## HOURLY ASSESSMENT OF IV SITE

CORRECT AMOUNT SOLUTION IN BAG  
COUNT DRIP RATE/ CHECK PUMP RATE  
CHECK PATENCY  
PALPATE VEIN FOR DISCOMFORT  
ASSESS SITE FOR INFILTRATION/  
PHLEBITIS  
ASSESS DRESSING FOR DRY AND INTACT  
EVALUATE RESPONSE TO THERAPY

## MAINTENANCE OF IV

Change IV bag every 24 hours  
Change every q 72 hours Tubing  
Dressing Saline lock ports IV site





# Lab Value Cheat Sheet

## Complete Blood Count (CBC)

- RBC: 4.5 - 5.5 million /  $\mu$ L
- WBC: 4500 - 11000 /  $\mu$
- Platelets: 150,000 - 350,000 /  $\mu$ L
- Hemoglobin
  - Male: 13 - 18 g/dL
  - Female: 12 - 16 g/d
- Hematocrit
  - Male: 39% - 54% g/dL
  - Female: 36% - 48% g/dL

## LipidPanel

Total Cholesterol: <200 mg/d  
Triglyceride: <150 mg/d  
LDL: <100 mg/dL (Bad Cholesterol)  
HDL: >60 mg/dL (Good Cholesterol)

## Liver Function Test (LFT)

- ALT: 13-69  $\mu$ L
- AST: 5-40  $\mu$ L
- ALP: 40- 120  $\mu$ L
- Bilirubin: 0.1 - 1.2 mg/dL

## Renal

- Calcium: 9 - 11 mg/dL
- Magnesium: 1.5 - 2.5 mg/dL
- Phosphorus: 2.5 - 4.5 mg/dL
- GFR: 90 - 120 mL/min

## Arterial BloodGas (ABGs)

- PaCO<sub>3</sub>: 35 - 45 mmHg
- PaO<sub>2</sub>: 80 - 100 mmHg
- HCO<sub>3</sub>: 22 - 26 mEq/L
- PH 7.35 - 7.45
- BE -2 To +2

## VitalSign

### Blood Pressure

- Systolic: 120mmHg
- Diastolic: 80mmHg
- Respiration: 12 - 20/min
- Temperature: 97.8 - 99F
- Pulse Ox: 95 - 100%
- Heart Rate: 60 - 100BPM

## Basal Metabolic Panel (BMP)

- Sodium: 135 - 145 mEq/L
- Potassium: 3.5 - 5.0 mEq/L
- Creatinine: 0.6 - 1.2 mg/dL
- Chloride: 95 - 105 mEq/L
- Albumin: 3.4 - 5.4 g/dL
- BUN: 7 - 20 mg/dL
- Total Protein: 6.2 - 8.2 g/dL
- Glucose (70-100 mg/dL)

## Pancreas

- Amylase: 30 - 110 U/L
- Lipase: 0 - 150 U/L

## Coagulation (COAGs)

- PT: 11 - 14 sec
- PTT: 25 - 35 sec
- aPTT: 30 - 40 sec (heparin)
- INR: 0.8 - 1.2 sec  
Warfarin Therapy: 2 - 3

## Cardiac

- Troponin I: < 0.1 ng/mL
- Myoglobin: 28 - 72 (M) 25 - 58 (E)
- Troponin T: < 0.3 ng/mL
- Creatine Kinase: 30 - 170

## HbA1c

- Non-diabetic: 4 - 5.6%
- Pre-diabetic: 5.7 - 6.4%
- Diabetic: >6.5%



# LAB VALUES MEMORY TRICKS

## Phosphorus (2.5-4.5)

- Phos: 4 letters
- Us: 2 (me + you = 2)  
Don't forget  
about the .5

## Potassium (3.5-5)

Bananas:  
-Just add 3-5 in  
every bunch and you  
want them half ripe (1/2)  
So think 3.5 - 5.0

## Calcium (9-11mg/L)

Call 911

## Chloride (95-105)

- Think of a  
chlorinated pool  
that you want to go  
in when it's SUPER  
HOT!: 95-905°F

## Sodium (135-145)

TOTAL PROTEIN  
• 6.4 - 8.0

# Medication Administration

## PHARMACOKINETICS

### ABSORPTION

Process on the drug after administration and before the drug enters systemic circulation.

### DISTRIBUTION

The vascular space to the tissues.

### METABOLISM

irreversible transformation of a parent compound into daughter compounds.

### ELIMINATION

Removal of the substances from the body.



## ADMINISTRATION ROUTES

### SUBLINGUAL ADMINISTRATION

A drug that is placed under the tongue, where it dissolves.

#### ADVANTAGE

Same as oral

Drug is rapidly absorbed in the bloodstream

#### DISADVANTAGE

If swallowed, drug may be inactivated by gastric juices.

Drug must remain under the tongue until dissolved and absorbed

### BUCCAL ADMINISTRATION

A medication is held in the mouth against the mucous membranes of the cheek until the drug dissolves.

#### ADVANTAGE

Same as oral

Drug can be administered for local effect  
Ensures greater potency because drug directly enters the blood and bypass the liver

#### DISADVANTAGE

If swallowed, drug may be inactivated by gastric juice

### ORAL ADMINISTRATION

solid capsules, pills, tablets, and powder  
liquid milk or other alkaline substances, such as syrup, suspension, emulsion, or elixir.

sugar-based syrup as a liquid medication  
water-based liquid medicine suspension.  
To adequately mix the medication, shake the bottle before using it.

a liquid medicine based on emulsion oil

Elixir is a liquid drug based on alcohol.

Allow 30 minutes to pass after elixir administration before giving water. This enables the drug to be absorbed as fully as possible.

## PRINCIPLES OF MEDICATION ADMINISTRATION

The "Six Rights" of drug regulation  
the appropriate medication

When giving drugs, the nurse compares the medication form's label to the medication container's label. Three times, the nurse repeats: Prior to taking the container out of the drawer or shelf: B. As the prescribed dosage is taken out of the container C. Prior to placing the container back in storage

### 2. THE RIGHT DOSE

When calculating or converting medicine, the nurse should have another licensed nurse verify the determined dose.

### 3- THE THIRD CLIENT

Making sure the drug is administered to the correct client is a crucial step in giving it safely.

To appropriately identify the client:

b. The nurse confirms the information on the client's identification bracelet by comparing it to the drug administration form and asking the client to state his or her name.

### 4. THE RIGHT ROUTE

The nurse consults the prescriber if a prescriber's order neither specifies nor does not specify a route of administration. The nurse should notify the prescriber right away if the recommended route is not the one provided.

### 5- RIGHT TIME

a. The nurse must know why a medication is ordered for certain times of the day and whether the time schedule can be altered  
b. Each institution has are commended time schedule for medications ordered at frequent interval  
c. Medication that must act at certain times are given priority (e.g insulin should be given at a precise interval before a meal)

### 6- RIGHT DOCUMENTATION

Documentation is an important part of safe medication administration

a. The documentation for the medication should clearly reflect the client's name, the name of the ordered medication, the time, dose, route and frequency  
b. Sign medication sheet immediately after administration of the drug



## ADMINISTRATION ROUTES

### TOPICAL ADMINISTRATION

Dermatologic – includes lotions, liniment and ointments, powder.

Ophthalmic – includes instillation and irrigation

Otic Instillation – to remove cerumen or pus or to remove foreign body

Nasal – Nasal instillations usually are instilled for their astringent effects (to shrink swollen mucous membrane), to loosen secretions and facilitate drainage or to treat infections of the nasal cavity or sinuses. Decongestants, steroids, calcitonin

Inhalation – use of nebulizer, metered-dose inhaler

Vaginal – drug forms: tablet liquid (douches), jelly, foam and suppository.

### COMPONENTS OF A COMPLETE ORDER

Last and first names of the clients.

Name of the drug Strength of the drug, if applicable

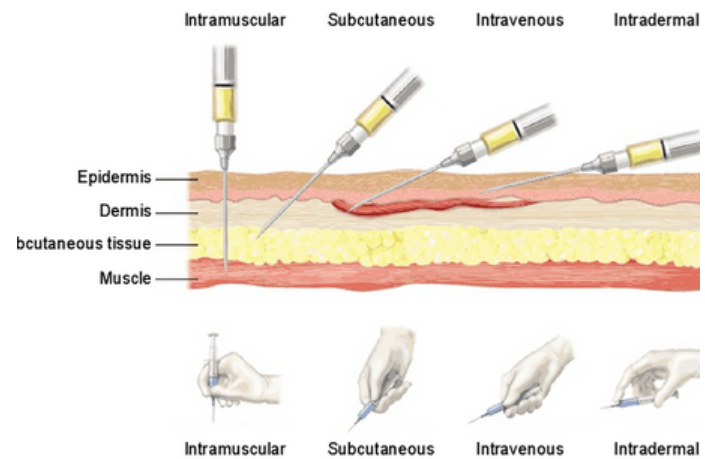
dosage of the drug to be taken

Administration route

specific usage guidelines, such as how frequently to provide

Provider signature Reason for administration, if medication is prescribed on a PRN or as required basis.

## PARENTERAL ROUTES



### Intradermal – under the epidermis

The area includes the upper chest, back, and area underneath the scapula. recommended for vaccines, tuberculin testing, and allergy testing. Use the needle gauges 25, 26, and 27; use a 3/8", 5/8", or 12" needle with a 10-15 degree angle and an upturned bevel. To create a wheal or bleb, inject a little dose of medication gently over 3 to 5 seconds Avoid massaging the injection site. to avoid both site irritability and medication absorption into the subcutaneous tissue.

### Subcutaneous– Vaccines, heparin, preoperative medication, insulin, narcotics

Medication should only be injected via the SC method in very modest dosages.

To reduce tissue injury, turn the injection location.

The identical ID injection needles with the same length and gauge are used.

### Intramuscular

Needle length is 1", 1 1/2", 2" to reach the muscle layer Clean the injection site with alcoholized cotton ball to reduce microorganisms in the area.

Inject the medication slowly to allow the tissue to accommodate volume.

### Intravenous

The nurse uses the following technique to give intravenous medication: 1. As a combination in huge amounts of IV fluids.

Using an intermittent venous access (heparin or saline lock) or a bolus, or tiny volume, of medication injected through an intravenous infusion line already in place

Using an already-existing IV line to "piggyback" an infusion of a solution containing the prescription drug plus a tiny amount of IV fluid.





# MEDICATION ABBREVIATION

Abbreviations	Meaning
a.c	Before meals
q.o.d	Every other day
a.m	Morning
b.i.d (bid)	Twice a day/Daily
gtt.	Drop(s)
h.	Hour
h.s	At bedtime
o.d	Right eye
o.s	Left eye
o.u	Both eye
p.c	After food
p.m	Afternoon
p.o or po	Orally
p.r or pr	Rectally
p.r.n	As needed
q.	Every
q.2.h	Every two hours
q.4.h	Every four hour
q.6.h	Every six hour
q.8.h	Every 8 hour
q.d	Every day
q.i.d	Four times a day
q.h	Every hour
q.s	A sufficient quantity
Rx	Prescription
Sig	Direction
Stat	Immediately no delay
t.i.d	Three times a day
u.d	As directed





# Nurse Nutrition

Nursing Nutrition refers to the science of how the body uses nourishing substances from food to support normal physiological functions and overall health.

## Type:

Nutrients are food ingredients that the body can utilize.

Nutrients' Purposes:

- \* Provide the body with energy
- \* Ensure physical development and cell upkeep
- \* Guard the body

Serious ailments may develop over time if one or more nutrients are persistently lacking from the diet. For instance, without the necessary nutrients in the right amounts, one can go blind, become infertile, or develop mental retardation. Bones may weaken and break, teeth may fall out, hairs may fall out, and skin irritation may occur.

## Classifications:

Nutrients can be classified into two major categories:

Macronutrients

Micronutrients

### Macronutrients

Carbohydrate, fats, protein, water Carbohydrate and fat provide energy to the body's cells, while protein help build cells and tissues.

Appropriate proportions

Carbohydrate 45-65%

Fat 20-35%

Protein 10-35%

Water provides no energy but are essential as the medium in which all of the body's chemical reactions takes place and it regulate body temperature.

### Micronutrient

vitamins, minerals, and trace elements as micronutrients The majority of micronutrients are regarded as essential nutrients since they are required in modest amounts yet are nonetheless essential for living functions. Additionally, the majority of micronutrients must be taken from food because they are not created by the body.

Nutrients are categorized into three by their importance in the human diet.

Essential nutrients are elements the body cannot produce and so must be received through diet in order to maintain health. For instance, even though the body cannot make vitamin C, it is necessary for several bodily processes, including enhanced iron absorption, infection resistance, and healthy teeth and gums.

Non-essential nutrients: the body can produce them and they are important for health. Choline, beta-carotene, certain amino acids, and other chemicals are among them.

The body can produce these nutrients, thus they are not typically needed in diets.





# Nurse Nutrition

Nutritional Nursing Nutrition is the study of how the body utilizes nutritive components from meals to maintain healthy physiologic processes in general.

## Metabolisms

is the culmination of all the physical and chemical processes necessary for the body to create, maintain, and repair cells as well as to produce energy.

### Catabolism and Anabolis

**Catabolism:** These terms specify, respectively the building up and breaking down of compounds and tissues within the body

**Anabolism:** These is a constructive process during which cells convert complex substances into simpler compounds, anabolism and catabolism are normal process the occur simultaneously, but anabolism predominates during growth and healing, while catabolism predominates during injury or illness.

## ENERGY: (Kcal/kJ)

The capacity to perform work is known as energy. In the context of human nutrition, energy refers to how the body uses the fuel found in nutrients by rupturing or catabolizing them. When engaging in strenuous activity, a person needs extra nutrients from food to meet their energy needs. Kilocalories or kilojoules (kJ) are typically used to express the amount of energy in food. A kcal is the amount of energy required to increase the temperature of 1 kilogram (or 1 liter) of water from 14.5 to 15.5C by 1 degree (Celsius or centigrade). 4.18 kJ are contained in one kcal

As a result of nutrition metabolism, 4 kcal/g of protein, 4 kcal/g of carbs, and 9 kcal/g of fat

For adults, age 31-50 with average height, weight, body mass index and daily activity, the avg daily recommended energy intake is 3,021 kcal/day for men, and 2404 kcal/day for women. When people are sick or injured, their energy needs increase.



## Digestion

### Phases Include

1. Ingestion
2. Movement
3. Mechanical and Chemical Digestion
4. Absorption
5. Elimination

## Type

### Mechanical (physical) <sup>s</sup>

- Chew
- Tear
- Grind
- Mash
- Mix

### Chemical

Enzymatic reactions to improve digestion o

Carbohydrates

Proteins

Lipids

## Digestive System

### Gastrointestinal (GI) tract

- Tube within a tube
- Direct link/path between organs
- Structures
  - Mouth
  - Pharynx
  - Esophagus
  - Stomach
  - Small intestine
  - Large Intestine
  - Rectum

## Mouth

Teeth mechanically break down food into small pieces. Tongue mixes food with saliva (contains amylase, which helps break down starch).

Epiglottis is a flap-like structure at the back of the throat that closes over the trachea preventing food from entering it.

## Esophagus

Approximately 10" long

• Functions include:

1. Secrete mucus
  2. Moves food from the throat to the stomach using muscle movement called peristalsis
- If acid from the stomach gets in here that's heartburn.

## Stomach

J-shaped muscular bag that stores the food you eat, breaks it down into tiny pieces.

- Mixes food with digestive juices that contain enzymes to break down proteins and lipids.
- Acid in the stomach kills bacteria.
- Food found in the stomach is called chyme

## Small Intestine

Small intestines are roughly 7 meters long

- Lining of intestine walls has finger-like projections called villi, to increase surface area.
- The villi are covered in microvilli which further increases surface area for absorption. Nutrients from the food pass into the bloodstream through the small intestine walls.

Absorbs:

- 80% ingested water
- Vitamins
- Minerals
- Carbohydrates
- Proteins
- Lipids

- Secretes digestive enzymes

## Large Intestine

About 5 feet long

- Accepts what small intestines don't absorb
- Rectum (short term storage which holds feces before it is expelled).

Functions

- Bacterial digestion
  - Ferment carbohydrates
  - Protein breakdown
- Absorbs more water
- Concentrate wastes



# Nutrition Assessment

Analyzing anthropometric, biochemical, clinical, and dietary data to ascertain a person's or a group's nutritional status. Nutrition assessment's goal is to: to evaluate the state of the diet. to ascertain the nutritional needs of the body.

In hospitals, malnutrition is fairly frequent and can cause delayed healing, a longer hospital stay, and higher medical costs.

Identifying risk for malnutrition

Nutritional assessment

Determines which patients are at risk for or have malnutrition

Subjective Global Assessment is one of the screening instruments.

Healthcare diagnoses

Clinical assessments of current or anticipated health issues that serve as the foundation for choosing the best nursing treatments

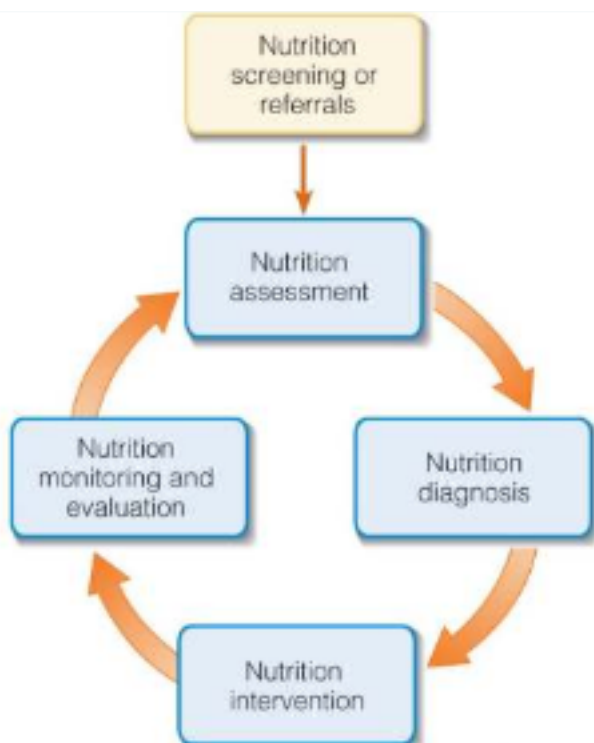
Category	Specific Examples
Admission data	Age, medical diagnosis, severity of illness or injury
Anthropometric data	Height and weight, body mass index (BMI), unintentional weight changes, loss of muscle or subcutaneous fat
Functional assessment data	Low handgrip strength, general weakness, impaired mobility
Historical information	History of diabetes, renal disease, or other chronic illness; use of medications that can impair nutrition status; extensive dietary restrictions; food allergies or intolerances; requirement for nutrition support; depression, social isolation, or dementia
Laboratory test results	Blood test results that suggest the presence of inflammation (such as low serum protein levels) or anemia
Signs and symptoms	Reduced appetite or food intake, problems that interfere with food intake (such as chewing or swallowing difficulties or nausea and vomiting), localized or general edema, presence of pressure sores



- Chronic confusion
- Chronic pain
- Constipation
- Diarrhea
- Disturbed body image
- Feeding self-care deficit
- Imbalanced nutrition: less than body requirements
- Impaired dentition
- Impaired oral mucous membrane
- Impaired physical mobility
- Impaired swallowing
- Insufficient breast milk
- Nausea
- Obesity
- Readiness for enhanced nutrition
- Risk for aspiration
- Risk for deficient fluid volume
- Risk for overweight
- Risk for unstable blood glucose level

The nutrition care process

- Systematic approach to medical nutrition therapy implemented by registered dietitians
- Nutrition assessment: collection and analysis of health-related data
- Nutrition diagnosis: what is included in a diagnosis?
- Nutrition intervention: appropriate plan
- Nutrition monitoring and evaluation: determine effectiveness.





## 1-HISTORICAL INFORMATION

Source

a medical history

interviewing the patient or caregiver - medical history

- history of prescription drugs and dietary

supplements - personal and social history - history of

food and nutrition

## 2-DIETARY ASSESSMENT

24-hour food recall

Guided interview covers the foods and drinks ingested the day before

What does the multiple-pass approach entail?

### Anthropometric data

Related to physical measurements of the human body

Can reveal nutritional problems: overnutrition or protein-energy malnutrition (PEM) Height (or length)

Box 13-3 describes standard techniques • Estimation techniques: knee height, full arm span

### Food frequency questionnaire

Foods and beverages regularly consumed during a specific time period May collect qualitative only or semiquantitative information What are limitations of this tool?

### Circumferences of waist and limbs

Waist: body fat evaluation

Limbs: muscle mass determination

### Food record

Written account of foods and beverages consumed during a specified time period, usually several consecutive days.

### Anthropometric assessment in adult

Used to evaluate the nutritional risks associated with illness

Rate of involuntary weight loss

Percentage of usual body weight (%UBW) •  $(\text{current weight} \div \text{usual weight}) \times 100$

Percentage of ideal body weight

$(\text{current weight} \div \text{ideal weight}) \times 100$

### Direct observation

Food intakes directly observed and analyzed

Nurses conduct patients' kcalorie counts

### Head circumference

Assess brain growth and malnutrition in children up to 3 years old Used to track brain development in premature and small-for-gestational-age infants

### Body weight

Weight changes may reflect changes in body water due to illness

Involuntary weight loss can be a sign of PE

Box 13-4 provides tips for accuracy

### Anthropometric assessment in infants and children

Used to evaluate growth

Periodic measurements of height (length), weight, and head circumference taken

Plotted on growth chart

Growth patterns <5th percentile

BMI-for-age <5th or >85th percentiles



### Anthropometric assessment in adult

In addition to body weight, why are skinfold and limb circumference measurements important in a nutrition assessment?

### Biochemical analyse

Information about PEM, vitamin and mineral status, fluid and electrolyte balances, and organ function  
Typically blood and urine samples Repeated measure  
Indicate improving or worsening condition

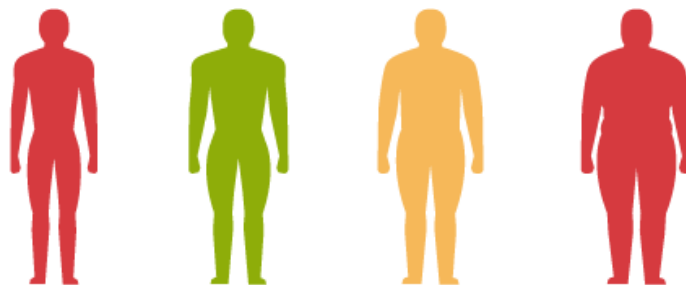
### Biochemical analyse

Serum protein  
Used to assess protein-energy status  
Albumin  
Used to gauge severity of illness  
Transferrin  
What is the correlation between iron status and transferrin levels?

### Biochemical analyse

Transthyretin (prealbumin) and retinol-binding protein  
Decrease rapidly during PE  
Respond quickly to improved protein intake  
C-reactive protein  
Rises rapidly in response to inflammation or infection  
Often elevated in critical illness

### Important



### BMI Chart

BMI less than 18.50	Underweight
BMI 18.50 - 24.99	Healthy weight
BMI 25.00 - 29.99	Overweight
BMI 30 or more	Obese

### Dietary principles

Energy : 20k.cal / kg bdwt  
Protein : 0.8 to 1g/kg  
bdwt Fat : 0.5g / kg bdwt  
Mineral: sodium is reduced  
Vitamins: A &  
High fiber : 50g / day

### THERAPEUTIC DIET

Therapeutic diets aim to maintain or restore a patient's healthy diet. The majority of the time, therapeutic diets are used to supplement the patient's medical or surgical care. However, in some circumstances, like with diabetes mellitus, a therapeutic diet replaces traditional medical therapy as the main part of the patient's care. Diet therapy places equal emphasis on healing from illness and preventing disease.



## DIETARY MANAGEMENT:

Objectives:

To relieve strain to the heart

To prevent further damage to the heart

To restore the damage heart

## FOOD RECOMMENDED:

Paneer made of skim milk and skim milk

pulses and cereals whole grains

all fruits and veggies

High-fiber foods with soluble fiber, such as gums, pectin, and oat meal fish, egg whites, and lean meat sugar, vegetable oils, and jaggery

## FOOD TO BE AVOIDED

Cholesterol rich food Whole cream,

butter, cream, cheese

Indian sweet meal like puddings,

bakery products Organ meat

Egg yolk, fish Nuts, oil seeds, pickles

Fried food

Alcohol

## DIET IN FEVER

The kind, severity, and length of the fever will determine the nutritional needs. The amount of calories needed increases throughout this phase. The customer must be fed frequently, and fat consumption must be limited 3-5000 ml of fluid per day must be consumed in the form of fruit juices and glucose.

Foods that are easily digested must be consumed. When a fever subsides, rice dal, milk puddings, or bread with milk must be consumed.

## FOOD TO BE AVOIDED

Extra milk or ilk products Meat, poultry and fish Dry fruit

Extra pulses, cereals, legumes, peas, beans Cakes, biscuits and bakery products, jams Campa cola, squash

Frits and fruit juices like lemon, mango, lime, plums Green leafy vegetables if potassium is restricted

## DIET MENU DURING HIGH GRADE FEVER

Light diet:

It must be given 2 hourly and contents must include milk, barley water, glucose at regular intervals To rebuild body tissues extra proteins must be given Examples milk, egg, curd etc Fried foods and diet containing fibers should be avoided

## DIET IN CONSTIPATION

Constipation is decreased frequency of passing stools or complete retention of faces of loose or watery stools.

The diet should include food rich in fiber contains like whole cereals, whole legumes and mature vegetables

Fruits rich in fibers like apple, banana, guava More fluids in the form of coffee, tea, fruit juices, warm water, butter milk etc

## DIET IN DIARRHOEA

Diarrhoea is increase frequently

It occurs in infectious condition of colon

Diet must include mainly fluids like oral boiled water containing electrolyte salts i.e glucose, sodium chloride etc

Fluids should be given quarter one hourly frequently Oral rehydration solution must be given

## NATUROPATHY

Naturopathy is the art and science of disease diagnosis, treatment and prevention using natural therapies including botanic medicine, hydrotherapy, traditional chinese medicine and life style counselling

## NATUROPATHY WORKS ON FIVE PRINCIPLES

Do not harm Use the healing power of nature to rejuvenate the body and mind Identify and treat the caus

Treat the whole person not the particular part with ailmen

Work on disease prevention and health promotion

## METHODS USED IN NATUROPATHY

Treatment based on nutrition and diet Detoxification: use of short period of fasting and controlled diets aid the natural processes by which body rids itself from toxic substance

Manual healing method: massage, acupuncture, yoga, meditation, hypnotherapy Herbal medicine

Homeopathy Hydrotherapy: using water Exercise and relaxation technique

## PRECAUTIONS

Naturopathy works on self healing.

Here, every individual is the doctor as everyone can heal himself

Water is the main nutrient It means not to avoid stress but how to deal with the stress Sometimes naturopathy require to stay in Ashrams Naturopathy best works in winter

Naturopathy practice require assistance



# NURSING PROCESS

Nursing process is a systematic, rational method of planning and providing nursing care. Its purpose is to identify a client's health care status, and actual or potential health problems, to establish plans to meet the identified needs, and to deliver specific nursing interventions to address those needs. The nursing process is cyclical; that is, its component follows a logical sequence, but more than one component may be involved at one time. At the end of the first cycle, care may be terminated if goals are achieved, or the cycle may continue with reassessment, or the plan of care may be modified.

## Characteristics of Nursing Process

The nursing process has distinctive 5 characteristics that enable the nurse to respond to the changing health status of the client. These characteristics include its cyclic centeredness; focus on problem solving and decision making, interpersonal and collaborative style, universal applicability, and use of critical thinking.

Each phase's data serves as input for the following phase. Evaluation results are incorporated into the assessment.

Consequently, the nursing process is a routinely occurring event or series of events (a cycle) that is always evolving rather than remaining static

Client needs come first in the nursing process. Instead of focusing on nursing objectives, the nurse organizes the plan of care around the client's problems. The nurse gathers information during the assessment phase to learn about the client's routines, habits, and needs. This information enables the nurse to include the client's routines as much as possible into the care plan. System theory and problem solving have been adapted for use in the nursing process. It can be seen as being similar to but distinct from the method employed by doctors (the medical model). Both procedures (a) start with the collection and analysis of data, (b) base action (intervention or therapy) on a problem statement (nursing diagnosis or medical diagnosis), and (c) have an evaluation component. The nursing approach is focused on a client's reactions to sickness illness, in contrast to the medical model's emphasis on physiological systems and the disease process

The nursing process involves decision-making at every stage. When it comes to deciding when and how to utilize data to inform decisions, nurses may be very inventive. Standard responses are not required of them, and they are free to use any of their available

The nursing process is a collaborative and interpersonal process. To satisfy their needs, the nurse must speak honestly and frequently with patients and their families. In order to provide top-notch client care, nurses must work together as a team as members of the healthcare system. The nursing process consists of five stages: assessment, diagnosis, planning, implementation, and evaluation.





# ASSESSING

The systematic, ongoing gathering, organization, validation, and documentation of data (information) is known as assessment. In reality, assessment happens continuously during every stage of the nursing process. For instance, assessment is carried out during the evaluation phase to examine goal attainment and the results of the nursing techniques. The correct and thorough gathering of data is essential to the success of every stage of the nursing process. Initial assessments, problem-focused assessments, emergency assessments, and time-lapsed reassessments are the four categories of assessments. The goal, scheduling, amount of time available, and client status of assessments all differ. The four activities that make up the assessment process are gathering data, organizing data, validating data, and documenting data.

TYPE	TIME PERFORMANCE	PURPOSE	PURPOSE
Initial Assessment	Performed within specified time after admission to a health care agency	To establish a complete database for problem identification, reference, and future comparison	Nursing admission
Problem-focused Assessment	Ongoing process integrated with nursing care	To establish a complete database for problem identification, reference, and future comparison	Hourly assessment of client's fluid intake and urinary output in an ICU Assessment of client's ability to perform self-care while assisting the client to bathe
Emergency Assessment	During any physiologic or psychologic crisis of the client	To identify lifethreatening problems To identify new or overlooked problems	Rapid assessment of a person's airway, breathing status and circulation during a cardiac arrest Assessment of suicidal tendencies or potential for violence.
Time-lapsed Reassessment	Several months after initial assessment	To compare the client's current status to baseline data previously obtained	Reassessment of a client's functional health patterns in a home care or outpatient setting or, in a hospital, at shift change





## Collecting Data

The process of acquiring data about a client entails the health theory, physical assessment, history and physical examination performed by the primary care physician, outcomes of laboratory and diagnostic tests, and information provided by other staff. Data on the client should contain both past events and current issues. A history of an adverse reaction to penicillin, for instance, is an important piece of historical information. Historical information might also include information about previous operations, traditional medical procedures, and chronic illnesses. Present-day events, such as discomfort, motion sickness, sleep patterns, and religious practices, are reflected in current data. Both the client and the nurse must actively participate in order to gather data effectively. Data might come from a primary source or a secondary source, and it can be either subjective or objective, constant or fluctuating.

## Types of Data

Subjective data, also known as symptoms or covert data, are only visible to the affected individual and may only be described or verified by that individual. Subjective data examples include itchiness, pain, and anxiety. Sensations, feelings, values, ideas, attitudes, and perceptions of one's own health state and circumstances are all examples of subjective data. Overt or objective data can be seen by an observer, measured, or tested against a recognized standard. They are also known as signs or overt data. They can be discovered through observation or physical investigation, and they can be seen, heard, felt, or smelled. A skin discolouration or blood pressure reading are two examples of objective data.

## Source of Data

There are primary and secondary data sources. The main source of data is the client. Secondary or indirect sources include family members or other comforters, other healthcare providers, records and reports, laboratory and diagnostic tests, and pertinent literature.

## Data Collection Methods

The principal methods used to collect data are observing, interviewing, and examining.

## Observing

Using the senses, one gathers information while they observe. It takes work and a planned strategy to develop the skill of conscious, focused observation.

## Interviewing

A planned contact or talk with a purpose, such as to get or impart information, identify issues of shared concern, assess change, impart knowledge, offer support, or offer counseling or therapy, is known as an interview.

The two methods for conducting interviews are directions and non-directives. The directed interview is quite structured and aims to elicit particular data. At least initially, the nurse determines the interview's goals and maintains control over it. The client replies to inquiries but may not have much of an opportunity to do so or to voice concerns. Contrarily, during a non-directive interview, also known as a rapport-building interview, the nurse gives the client discretion over the conversation's goal, topic, and pace. Understanding between two or more persons is referred to as rapport.



## Examining

In order to identify health issues, the physical examination or physical assessment involves observation (i.e., the senses of sight, hearing, smell, and touch). The nurse performs the examination using inspection, auscultation, palpation, and percussion procedures.

## Organizing Data

The assessment information is methodically organized by the nurse using a written (or digital) format. This is also known as a nursing assessment, nursing history, or nursing data-base form. Depending on the client's physical condition, a different format might be employed, such as one that emphasizes musculoskeletal information for orthopedic customers.

## Validating Data

Because the nursing diagnoses and interventions are based on the information acquired during the assessment phase, it is essential that this information be comprehensive, factual, and correct. The process of "double checking" or confirming data to ensure its accuracy and veracity is known as validation. By validating the data, the nurse can accomplish the following tasks

- Ensure that assessment information is complete
- Ensure that objective and related subjective data agree
- Obtain additional information that may have been over-looked.
- Differentiate between cues and inferences. Cues are subjective or objective data that can be directly observe by the nurse; that is, what the clients says or what the nurse can see, hear, smell, or measure. Inference are the nurse's interpretation or conclusions made based on the cues (e.g., a nurse observes the cues that an incision is red, hot and swollen; the nurse makes an inference that the incision is infected)
- Avoid jumping to conclusions and focusing in the wrong direction to identify problems.

## Documenting Data

The records client information to finish the assessment step. All information gathered on the client's health status should be included in the record, which must be accurate. Data are factually recorded rather than being interpreted by a nurse. For instance, the nurse enters "coffee 240 ml, juice 120 ml, 1 egg, and 1 slice of toast" instead of the judgmental "appetite good" while logging the client's breakfast intake (objective data). "Appetite good" or "normal appetite" are judgments or conclusions that may signify different things to different people. The nurse captures subjective information using quotation marks and the client's own words to increase accuracy. Reiterating anything someone says in another way increases the likelihood that the original meaning may be altered.



# DIAGNOSING

Diagnosing is the second phase of the nursing process. In this phase, nurses use critical thinking skills to interpret assessment data and identify client's strengths and problems. Diagnosing is a pivotal step in the nursing process. Activities preceding this phase are directed toward formulating the nursing diagnoses; the care-planning activities following this phase are based on the nursing diagnoses.

## TYPES OF NURSING DIAGNOSES

Actual, risk, wellness, potential, and syndrome are the five different categories of nursing diagnoses.

A client issue that exists at the time of the nursing assessment is an actual diagnostic. Anxiety and poor breathing are two examples. The presence of corresponding signs and symptoms serves as the foundation for a nursing diagnosis.

A risk nursing diagnostic is a clinical conclusion that a problem does not exist, but the existence of risk factors suggests that, absent nursing intervention, a problem is likely to arise. For instance, all hospital patients are at some risk of contracting an infection; however, patients with diabetes or weakened immune systems are more vulnerable than others. Consequently, the healthcare provider would legitimately use the term "risk for infection" to characterize the

- A diagnostic of wellbeing "describes human responses to levels of wellness in an individual, family, or community that have a readiness for enhancement" Examples of wellness diagnosis are readiness for improved family functioning or preparation for improved spiritual well-being
- A possible nursing diagnosis is one in which evidence about a health problem is incomplete or unclear. A possible diagnosis requires more data either to support or to refute it. For example, an elderly widow who lives alone is admitted to the hospital. The nurse notices that she has no visitors and is pleased with attention and conversation from the nursing staff. Until more data are collected, the nurse may write a nursing diagnosis of possible social isolation related to unknown etiology
- A syndrome diagnosis is a diagnosis in which is associated with a cluster of other diagnoses. Currently six syndrome diagnoses are on the NANDA international list. Risk for disuse syndrome, for example, may be experienced by long-term bedridden clients. Clusters of diagnoses associated with this syndrome include impaired physical mobility, risk for impaired tissue integrity, risk for activity intolerance, risk for constipation, risk for infection, risk for injury, risk for powerlessness, impaired gas exchanged, and so on.

## Analyzing Data

In the diagnostic process, analyzing involves the following steps

- Compare data against standards (identify significant cues)
- Cluster cues (generate tentative hypothesis).
- Identify gaps and inconsistencies.

For experienced nurses, these activities occur continuously rather than sequentially.

## Comparing data with Standards

To compare client data to norms and standards and to find significant and pertinent cues, nurses draw on their expertise and experience. An recognized measure, guideline, model, or pattern is referred to as a standard or norm. The nurse makes use of many different benchmarks, including growth and developmental patterns, typical vital signs, and laboratory findings.



## Clustering Cues

To compare client data to standards and norms and find significant and pertinent clues, nurses draw on their expertise and experience. A standard or norm is a measurement, rule, model, or pattern that is widely accepted. A variety of criteria are used by the nurse, including growth and development trends, typical vital signs, and laboratory values.

## Identifying gaps and Inconsistencies

Effective assessment reduces data gaps and discrepancies. However, a last check should be performed on the data before analysis to make sure they are accurate and comprehensive.

Conflicting data are inconsistencies. Measurement mistake, unrealistic expectations, and inconsistent or incorrect reports are all potential sources of contradicting data. For instance, the nurse might discover from the client's nursing history that he hasn't seen a doctor in 15 years, yet during the physical health assessment, he claims, "My doctor takes my blood pressure every year." A meaningful pattern cannot be established until all discrepancies are resolved.

## Identifying Health Problem, Risks and Strength

After data are analyzed, the nurse and client can together identify strengths and problems. This is primarily a decision-making process.

## Determining Problem and Risk

The nurse and client jointly identify issues that support tentative actual, risk, and potential diagnoses after grouping and clustering the data. The nurse must also decide whether the client's issue is one that requires nursing diagnosis, medical diagnosis, or collaborative problem solving.

## Determining Strengths

At this point, the nurse and client's coping mechanisms, resources, and strengths. The majority of people have a more accurate impression of their issues or flaws than of their advantages and qualities, which they frequently take for granted. The client might create a more nuanced self idea and self image by conducting an inventory of their abilities. Strengths may help to stop the body's natural healing and regenerating processes.

## Formulating Diagnostic Statements

Most nursing diagnoses are written as two-part or three-part statements, but there are variations of these.

## Basic Two-Part Statements

The basic two-part statement includes the following

- Problem (P): statement of the client's response
- Etiology (E): factors contributing to or probable causes of the responses

The terms linked to, not due to, are used to connect the two parts. Due to signifies that one portion is the root of or accountable for another. The phrase related to, however, just suggests a connection.





## Basic Three-Part Statements

The basic three-part nursing diagnosis statement is called the PES format and includes the following

Problem (P): statement of the client's response

Etiology (E): factors contributing to or probable causes of the response

Signs and Symptoms (S): defining the characteristics manifested by the client.

The three-part phrase can be used to describe actual nursing diagnoses because the signs and symptoms have been established. Since the client lacks the necessary symptoms and indicators for the diagnosis, this format cannot be used for risk diagnoses. The PES format is highly advised for novice diagnosticians because the signs and symptoms support the diagnosis and enhance the descriptiveness of the problem statement.

## One-Part Statement

Some diagnostic statements, such as wellness diagnoses and nursing diagnoses for syndromes, only include a NANDA label. So that nursing interventions can be drawn from the diagnostic label itself, diagnostic labels have a tendency to become more specific as they are improved. Consequently, an etiology might not be required. As an illustration, adding an etiology to the term "Rape-Trauma Syndrome" does not make the term more helpful or descriptive.

## Evaluating the Quality of the Diagnostic Statement

The content of the diagnostic statements should also be taken into account by the nurse in addition to the proper structure. For instance, the sentences should be precise, succinct, descriptive, and specific. The nurse must consistently compare the client's indications and symptoms to the NANDA defining criteria and validate the diagnostic statements with the client. The nurse checks the client's risk variables to NANDA risk factors to identify any risk issues.

# PLANNING

Planning is a deliberate, organized stage of the nursing process that entails making decisions and solving problems. In order to formulate client goals and develop the nursing interventions necessary to avoid, lessen, or eliminate the client's health concerns, the nurse refers to the client's assessment data and diagnostic statements for guidance. Nursing intervention is defined as "any treatment that a nurse performs to improve patient/client outcomes based upon clinical judgment and knowledge." A client care plan is the result of the planning process.

Although the nurse is primarily in charge of planning, a plan cannot be successful without the client's and support personnel's input. The client is not planned for by nurses; rather, they are encouraged to engage as actively as they can. The plan of care is implemented in a home environment by the client's support personnel and caregivers, and as a result, a substantial portion of its success depends on them.

## TYPES OF PLANNING

Planning begins with the first client interaction and continues up until the client-nurse relationship is terminated, which often occurs when the client is released from the healthcare facility. All planning is multidisciplinary (involves communication between all healthcare professionals and the patient) and incorporates the patient and family as much as is practical at each stage.





## Initial planning

The initial comprehensive plan of care is often created by the nurse who conducts the entrance exam. The client's body language and some intuitive information that cannot be obtained merely from the written database are advantages that this nurse has. After the initial examination, planning should start as soon as feasible, especially given the tendency toward shorter hospital stays

- to determine whether the client's health status has changed
- to set priorities for the client's care during the shift
- to decide which problems to focus on during the shift
- to coordinate the nurse's activities so that more than one problem can be addressed at each client contact

## Ongoing planning

All nurses that work with the client engage in ongoing planning. Nurses can further individualize the initial care plan as they gather additional information and assess the client's reactions to care. The nurse arranges the care to be provided that day as part of ongoing planning that takes place at the start of each shift. The nurse conducts daily planning for the following goals using ongoing evaluation data:

## Discharge planning

Every client's care plan should include information about discharge planning, which is the process of anticipating and preparing for needs following discharge. It is an essential component of comprehensive health care. People are occasionally discharged from acute care hospitals with unmet treatment needs since the typical length of stay for patients has decreased. Even while many clients are transferred to other organizations (such long-term care institutions), this type of care is increasingly provided at home. Effective discharge planning starts with the initial client interaction and includes a thorough assessment that continues over time to learn more about the client's ongoing needs.



## Developing a nursing care plan

A formal nursing care plan is the result of the planning stage of the nursing procedure. A strategy for action that exists in the nurse's head is referred to as an informal nursing care plan. For instance, the nurse might believe that Mrs. Pham is exhausted. After she has had time to recuperate, I will need to reiterate her instruction. A formal nursing care plan is a document or electronic manual that provides details regarding the client's care. The formal written care plan's provision for continuity of care is its most evident advantage. A formal plan known as a standardized care plan outlines the nursing care for groups of clients with similar needs. An individualized care plan is created to address the particular requirements of a

### Guidelines for writing nursing care plan

The nurse should use the following guidelines when writing nursing care plans:

- Date and sign the plan.
- Use category headings.
- Use standardized/approved medical or English symbols and key words rather than complete sentences to communicate your ideas unless the agency policy dictates otherwise
- Be specific.
- Refer to procedure books or other sources of information rather than including all the steps on a written plan.
- Tailor the plan to the unique characteristics of the client by ensuring that the client's choices, such as preferences about the times of care and the methods used.
- Ensure that the nursing plan incorporates preventive and health maintenance aspects as well as restorative ones.
- Ensure that the plan contains interventions for ongoing assessment of the client.
- Include collaborative and coordination activities in the plan
- Include plans for the client's discharge and home care needs.

## IMPLEMENTING

Implementing is the stage of the nursing process where the nurse actually executes the nursing interventions. Using NIC terminology, implementing entails doing and recording the exact nursing procedures required to carry out interventions. The nurse completes the implementing step by documenting nursing actions and the client responses that resulted from the nursing activities that were planned in the planning step.

### Implementing Skills

Nurses require technical, interpersonal, and cognitive abilities to successfully carry out the care plan. Although these abilities are separate from one another, nurses sometimes combine them and give different emphasises depending on the activity. For instance, the nurse needs interpersonal skills to explain and reassure the patient when putting a urinary catheter. She also needs cognitive knowledge of the concepts and processes of the surgery. and technical expertise in using the equipment and drapery on the client.

The cognitive (intellectual) skills include problem-solving, judgment, creativity, and critical thinking. They are essential to provide safe, sage nursing care.

All of the verbal and nonverbal behaviors people employ when engaging face-to-face with one another are referred to as interpersonal skills. The success of a nurse's intervention frequently rests heavily on her interpersonal skills. In order to comprehend the client and be understood in return, the nurse uses therapeutic communication. A nurse must be able to collaborate well with others as a part of the medical staff.



Technical skills include consciously "hands-on" abilities such as handling tools, administering injections, bandaging, moving, lifting, and repositioning patients. These abilities may also be referred to as tasks, processes, or psychomotor abilities. The term "psychomotor" describes bodily movements that are thought-controlled rather than reflexive.

### Process of implementing

The process of implementing normally includes the following

- Reassessing the client
- Determining the nurse's need for assistance
- Implementing the nursing intervention
- Supervising the delegated care
- Documenting nursing activities

### EVALUATING

Evaluating involves judging or appraising. The fifth and last stage of the nursing procedure is evaluating. In this application, evaluation refers to a deliberate, continuing process in which clients and healthcare professionals assess (a) the client's progress toward achieving goals or outcomes and (b) the efficacy of the nursing care plan. Since the results of the evaluation are what determine whether nursing treatments should be stopped, continued, or adjusted, evaluation is a crucial part of the nursing process.

Continuous evaluation is done. An evaluation conducted during or just after carrying out a nursing order enables the nurse to alter an intervention right away. Evaluation carried out at predetermined intervals (e.g., once per week for the client receiving home care) demonstrates the degree of objective achievement.

### Process of evaluating client response

The nurse decides on the desired results (indicators) that will be used to gauge client goal achievement before evaluation.

Planning is where this is done. Desired results have two functions: They specify the kind of evaluative data that must be gathered and offer a benchmark for evaluating the data. For instance, any nurse caring for the client would know what information to gather given the following expected results.

Drinking water should not total less than 2500 ml per day. • Fluid intake and urinary output will be in balance.

There will be less than 100ml of residual pee.

### The evaluation process has 5 components

- gathering data on the desired result (NOC indicators); contrasting the data with the result; connecting nursing operations to the result;
- Making judgments about the severity of the issue
- deciding whether to keep, change, or end the nursing care plan



# Pathophysiology

DISEASE

Empty box for notes related to the disease.

PATHOPHYSIOLOGY/DISEASE

Empty box for notes related to the pathophysiology of the disease.

SIGN & SYMPTOMS

Empty box for notes related to the signs and symptoms of the disease.

RISK FACTORS

Empty box for notes related to the risk factors of the disease.

TREATMENT

Empty box for notes related to the treatment of the disease.

COMPLICATIONS

Empty box for notes related to the complications of the disease.

NURSING INTERVENTIONS

Empty box for notes related to the nursing interventions for the disease.

PATIENT EDUCATION

Empty box for notes related to patient education for the disease.

DIAGNOSTICS & LABS

Empty box for notes related to the diagnostics and lab tests for the disease.



GENERIC NAME:
BRAND NAME:
DRUG CLASS:

# Pharmacology

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE

ABNORMAL DISCHARGE





# Nursing Study Skills

## HOW TO STUDY AND BE SUCCESSFUL IN THE NURSING PROGRAM

### BE PREPARED

Always do some reading before a talk

- Skim the material, at the very least.

Make a note of question

- Mark the page and type the question there
- Add your thoughts in
- Check to see if it was discussed in class

It could be clarified before you have to ask about it

Outline the Chapters to be covered that day

- Don't highlight just yet because you will have too much data
- You can include "key points" in lectures by outlining the chapters.

Utilize all resources to clarify information

- such as the internet
- Take care where you obtain information.

### ATTEND CLASS

Show up on-time and prepared

- Have your book, notes, outline, etc

Stay through the entire lecture

- Never presume that someone else will take notes that make sense to you.

Participate in lecture

- If you're confused, ask for explanation.
- actively engage in case studies and other activities



## STUDY SMART

Remember, you are going to be a NURSE

- Focus on nursing aspects

Don't highlight the entire book

- That would be way too much to study
- Use your HESI book to minimize the material

Separate the „need-to-know“ from the „good-to-know“

- Focus on nursing

Use your notes from class as a guide, not the template of exams

- Nursing involves putting the theories and disease(s) you learn into practice.
- Your readings should not be replaced with lectures.

Prior to understanding the first chapter, don't move on to the next one.

## DEDICATE A SCHEDULE

Treat school as your JOB

- Invest in your education
- You are professionals because nursing is your vocation.

Set up a realistic study schedule

- 8 hours a day is not a reasonable goal
- It is not productive to study for 12 hours on Saturdays every week (cramming).

Add in times for exams, papers, etc

- Your schedule of exams is given to you well in advance for all courses
- Study ahead of schedule

There will be exams in the same week, and even the same day(s)

For each lecture hour, 2-4 hours of preparation are advised. Study everyday

## QUESTIONS

every week, review questions on the subjects covered

Utilize different NCLEX study guides Utilize the online tools provided with your texts. There are never enough questions to ask.



## COMMON MISTAKES

Studying like you are taking a history exam

- also known as rote education
- The majority of learning is not from memorization.

Studying too much material and grasping none of it

- known as underlining the book
- not condensing the material using HESI and notes

Not focusing on the nursing aspects of the chapter

- You will be expected to use the nursing process to answer 95% of exam questions

## TEST TIPS

Be prepared

- daily study Use NCLEX practice exams

Get plenty of rest

- Rest is essential for optimal brain function.

Give yourselves a break

- Be kind to yourself; this is just a learning process.

Take your time

## QUESTIONS

Review questions covering the topics each week

Utilize different NCLEX study guides Utilize the online tools provided with your texts. You can never do enough questions



# Vital Signs

measurements that are regularly conducted to determine the condition of the patient. Vital signs are rapid, straightforward tests that tell us a lot about the patient.

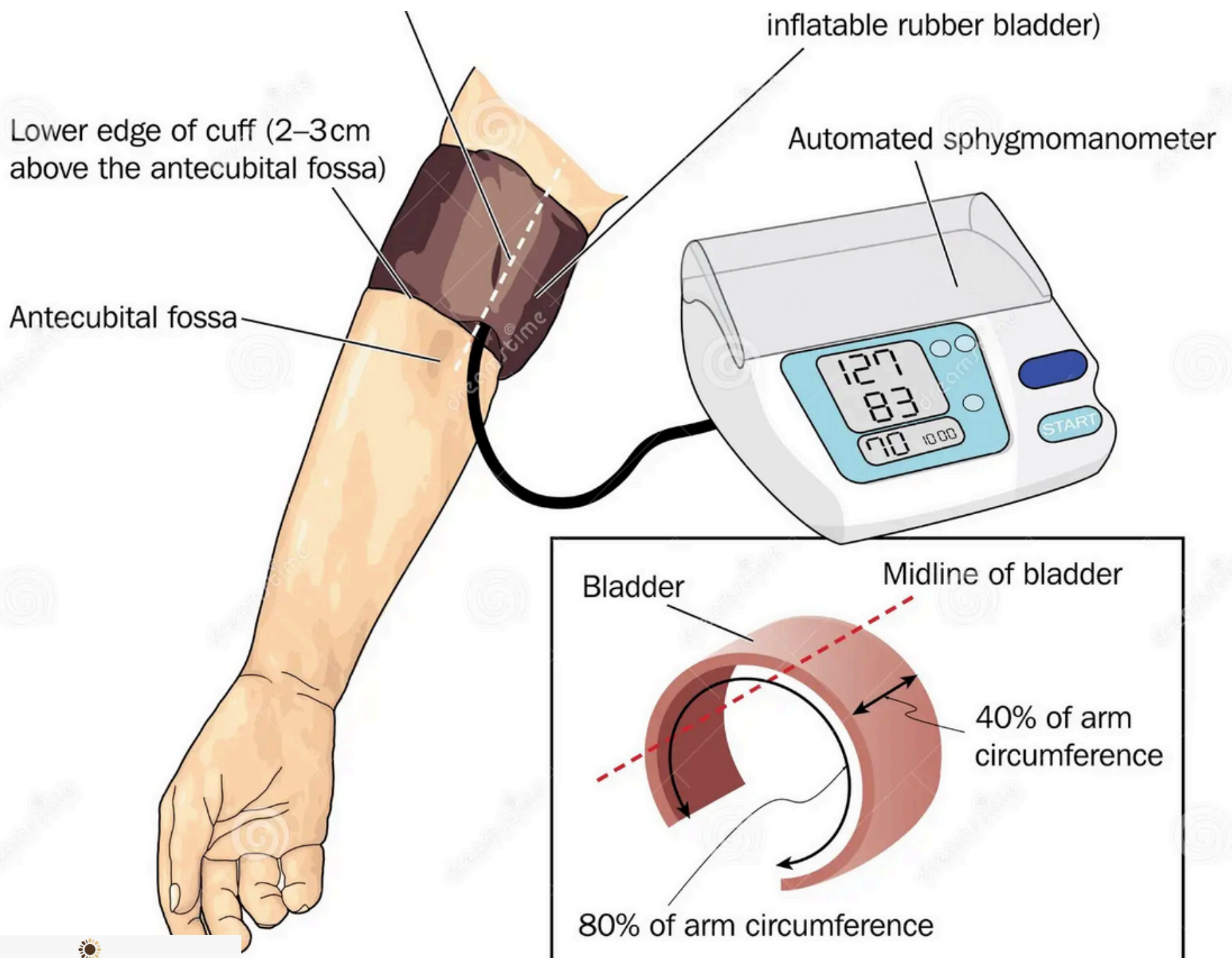
5 types are present.

- 1- blood pressure,
- 2- Pulse,
- 3- Breathing,
- 4 - The temperature and
- 5- Pain

Although it is frequently tested together with the vital signs, oxygen saturation is not a true vital sign.

## BLOOD PRESSURE

Blood pressure measurements includes systolic and diastolic pressures.



## SYSTOLIC PRESSURE

The maximal pressure exerted on the arteries during contraction of left ventricles of heart.

## DIASTOLIC PRESSURE

the force applied to the artery wall when the ventricles are at rest.

a measure of the blood's resistance to the walls of the arteries (an indirect indicator of heart output).

- Measured in milliHg
- Systolic (heart rate) is the highest figure.
- Diastolic (heart at rest) is the bottom number.
- For adults, normal ranges are  $>90/60$  and  $120/80$ .

## PULSE

The pulse is a wave of blood created by contraction of the left ventricle of the heart

is able to be evaluated by auscultating the apical pulse or palpating the radial pulse

We gauge the pulse's speed, rhythm, and overall quality

Normal ranges are greater than 60 and less than 100 while at rest.

## TACHYCARDIA

An abnormal rapid heart rate over 100 beats/min.

## BRADYCARDIA

An abnormal slow heart rate below 60 beats/min.

## BOUNDING

Strong full force pulse.

## THREADY/ WEAK

Difficult to palpate, a pulse of diminished strength.

## ABSENT

No palpable pulse





## IRREGULAR

When interval varies between pulse.

## BIGEMINAL PULSE

A regular irregular pulse occurring with premature beats.

## DICROTIC

The second pulse of a split or double beat was weaker than the first.

## COMMON PULSE POINT

- TEMPORAL
- CAROTID
- APICAL
- BRACHIAL
- RADIAL
- FEMORAL
- POPLITEA
- POSTERIOR TIBIAL
- DORSAL PEDIS

## RESPIRATION

necessary. Recorded in the US in degrees Fahrenheit

Normal is >96 and <99

The process of breathing involves supplying the body's tissues with oxygen and expelling carbon dioxide. The lungs are crucial to this process.

RESPIRATION RATE DEPTH RHYTHM

## RESPIRATION RATE

The average adult breathing rate is between 14 and 20 breaths per minute.

## DEPTH

By analyzing the chest's movement during inspiration, which may be deep or shallow, it is calculated.

## RHYTHM

It denotes an equal space between each breath.



## TERMS OF RESPIRATION

- TACHYPNOEA: An elevated respiration rate greater than 24 breaths per minute
- BRADYPNOEA: A reduced respiratory rate of fewer than 10 breaths per minute
- Complete stoppage of breathing or respiratory rate (APNEOA)
- Increase in breathing depth is known as hyperapnea.

## TEMPERATURE

**The temperature of the body is an important symptom.**

96 and 99 are considered to be normal.

necessary. Recorded in the US in degrees Fahrenheit

Normal is >96 and <99

