Toppersnotes
Unleash the topper in you

AIIMS-NORCET

Nursing Officer Recruitment Common Eligibility Test

ALL INDIA INSTITUTE OF MEDICAL SCIENCE

Volume – IV

Fundamental of Nursing, Management & Accountancy

SIERRA INNOVATIONS

FUNDAMENTAL OF NURSING

FUNDAMENTAL OF NURSING

* Intro =>

⇒ Florence Nightingle / founder of modern n/sg
Also known as "Lady with the lamp"

Born → 12 May 1820 in Florence Italy

Died → 13 Aug 1910 parklane London england
UK (united kindon)

"International Nurse's Day → "12 May"

⇒ The Ist N/sg School was Florence Nightingle traning School at. Thomas Hospital London.

* Nursing → Comes latin word "Noutrie" that means:→
  * To Nourish
  * To Cherish
  * To support
  * To Good Health

Ion → Atom → charges → + (Catair) − (Anion)

Blood pH → 7.35 – 7.45

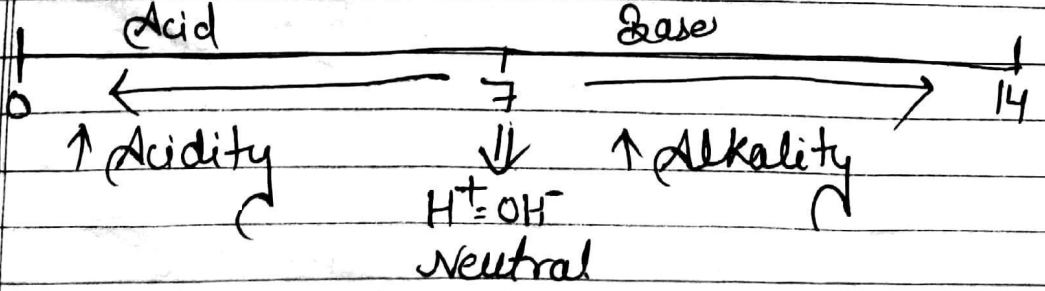
Acid - Base Balance

	Acid	Base
①	They contain H^+ ion	① They contain Hydroxide ion (OH^-) OR Hydroxyl ion (OH)
②	Denote H^+ (Hydrogen)	② Denote OH^-
③	OH^- Acceptor	③ H^+ Acceptor
④	pH ⇒ less than 7	④ pH ⇒ More than 7
⑤	Test → Sour	⑤ Test → Bitter
⑥	Eg → HCl	⑥ Eg → NaOH

* pH Scale

(Power of Hydrogen / Potential of Hydrogen)

* Invented By ⇒ Dr. Soren Sorenson (1909)



Homeostasis ⇒ Balance b/w in Internal or External environment.
↓ ↓
Dome Standing

* Formulla of pH ⇒

$pH = \log\left(\frac{1}{H^+}\right)$ $pH = -\log H^+$

DSSB Q pH = Negative logarithem of Hydrogen ion

* ACID-BASE REGULATION :→ Maintain By Mechanism

① Chemical Regulation ② Physiological Regulation ③ K^+ Exchange

① Chemical Regulation ⇒

* Buffer ⇒ A substance or group of substance which can absorb or donate Hydrogen ion (H^+) to correct acid-Base imbalance.

Buffer system present in body :→

a) Bicorbonate + Carbonic acid
b) Phosphate
c) Plasma protein → (Albumin)
d) Hemoglobin

(H_2CO_3)

9/ Bicarbonet and Carbonic Acid ⇒

$CO_2 + H_2O \rightleftharpoons H_2CO_3 \rightleftharpoons H^+ + HCO_3^-$

H_2CO_3 ⇓ Carbonic Acid

$H^+ + HCO_3^-$ ⇓ Bicarbonet Acid

Acidosis ⇒ $H^+ + HCO_3^- \longrightarrow H_2CO_3$ (wk Acid)

(H^+ Strong Acid)

Alkalosis ⇒ $OH^- + H_2CO_3 \longrightarrow H_2O + HCO_3^-$

OH^- ⇓ (Strong Base)

HCO_3^- ⇓ (wk Base)

⇒ Also known as Primary Buffer

Q ⇒ Bicarbonate : Carbonic Acid
20 : 1

** Our Body maintain the pH 7.4 by 20 part Bicarbonate and 1 part Carbonic acid.

$HCO_3 : H_2CO_3$
20 : 1
24 mEq/L = 1.2 mEq/L

Q* Carbonic acid is controlled By lungs through excretion of Carbondi-oxide

Q* Bicarbonet is Controlled By ~~Kidney~~ excretion through kidney.

Volatile Acid ⇒ 13000 - 30,000 mEq per day excreted By lungs

Non-volatile Acid ⇒ 50 mEq per day excreted By the kidney.

(B) Phosphate Buffer

* Acidosis ⇒ $H^+ + HPO_4^{2-} \longrightarrow H_2PO_4^-$

H^+ ↓ Strong Acid

HPO_4^{2-} ↓ Mono Hydrogen phosphate

$H_2PO_4^-$ ↓ wk acid

* Alkalosis ⇒ $OH^- + H_2PO_4^- \longrightarrow H_2O + HPO_4^-$

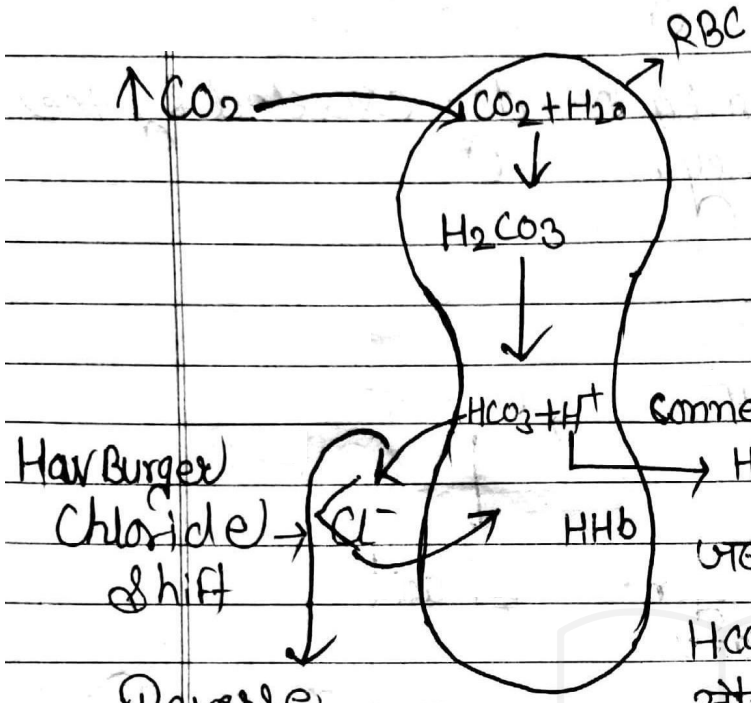
OH^- ↓ Strong Base

$H_2PO_4^-$ ↓ Di Hydrogen phosphate

$H_2O + HPO_4^-$ ↓ wk Base

(C) Plasma protein (Albumin) ⇒ It is a negative Charge protein act as a buffer.

(D) Hemoglobin ⇒ System maintain Acid-base balance by a process ⇒ Called "chloride shift".



जब RBC lungs में जाती है तो HCO_3^- ion अन्दर चले जाते है और Cl^- बाहर आ जाता है। इसे Reverse chloride shift कहा जाता है।

Q//

TBW	ICF	ECF
Catain	K^+	Na^+
Anain	PO_4^{2-}	Cl^-

(2) Physiological Machanism :→

(A) Respiratory Machanism ⇒ By Lungs.

Acidosis ⇒ Rate/depth → ↑se → Hyperventilation

Alkalosis ⇒ Rate/depth → ↓se → Hypoventilation

90% Acid in Body

(B) Renal Mechanism ⇒ By kidney.

Acidosis → H^+ ion Secreted into tubules and Combined with Buffer. and excreted in the form of urine.

Alkalosis → The bicarbonate Secreted into tubules and Combine with electrolyte (Na) and excreted in the from of urine.

(3) Imp K^+ Exchange → K play a exchange role to maintain acid-Base balance.

Acidosis ⇒ Hyperkalemia (More than 5 mEq/L) Because H^+ ion inside and K^+ outside exchange

Alkalosis ⇒ Hypokalemia (Less than 3.5 mEq/L)

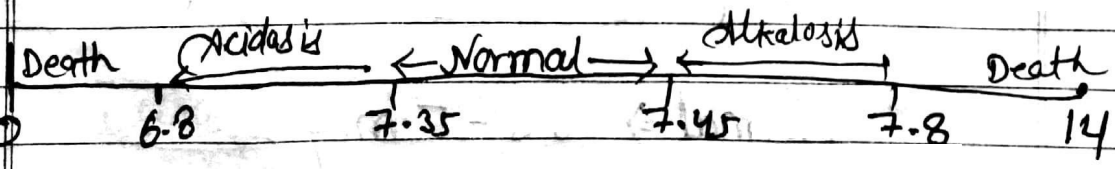
Normal ⇒ 3.5 - 5 mEq/L
Serum K^+ Level

* In acid - Base imbalance monitor K level closely

In alkalosis H^+ ion ↓se & OH^- ione ↑se for correction alkalosis H^+ ions comes cell to outside of cell & K^+ go into the cell

*ACID-BASE IMBALANCE

1. Acidosis
   - (A) Respiratory
   - (B) Metabolic
2. Alkalosis
   - (A) Respiratory
   - (B) Metabolic



(1) Acidosis ⇒

(A) Respiratory Acidosis — It is rise in H^+ ion due to alveolar Hypoventilation

Causes ⇒ (1) Respiratory System Disorder
Eg → Asthma, COPD, Emphysema, Bronchiectasis, pulmonary edema, pulmonary Embolism, pneumonia.

(2) Brain Trauma
(3) CNS Depression Eg → Sedative, narcotics, Anesthesia.

Cause → RBC ⇒ R → Respiratory System disorder
B → Brain Tumor
C → CNS Depression

C/M ⇒
* Hypoventilation → Hypoxia → Drowsiness, Dizziness, Disorientation, Headache, Coma, stale
* Hypotension
* Dysrhythmia, warm flush skin
* Seizure.

Mgt ⇒
⇒ O2 therapy
⇒ Semifowler's position
⇒ Succtioning
⇒ Hydration → Improve

⇒ Antibiotic if Respiratory Infection
⇒ Encourage deep Breathing & Coughing.
⇒ ET intubation & Mechanical ventilation if respiratory distress present.

(B) Respiratory Alkalosis ⇒ ↓se in H^+ ion due to alveolar Hyperventilation

* Causes ⇒ HOPF
  - H ⇒ Hypoxia
  - H ⇒ Hysteria
  - O ⇒ Overventilation by mechanical ventilator
  - P ⇒ pain
  - F ⇒ fever due to ↑se metabolic Rate
    1°F = ↑10% of Metabolism

* CIM ⇒
  - Both ⇒ Hyperventilation
    ⇒ Lethargy, Light Headache, Confussion
    ⇒ Nausea, vomiting, Epigastric pain
    ⇒ Tachycardia, dysRhythmias
  - Both ⇒ Tetany, Numbness, Tinling in Extermities
    ⇒ Seizures

Tetany → Due to deficiency of calcium

* Mgt ⇒
  - ⇒ Encourage appropriate breathing pattern
  - ⇒ Voluntry hold of Breath

⇒ Use of Rebreather mask OR CO_2 Breath By paper bag

⇒ Appropriate Care of the pt. on mechanical ventilator.

⇒ Injection Calcium Gluconate → If tetany

(C) Metabolic Acidosis ⇒

* Definition ⇒ (Use in H^+ ion due to abnormal metabolic process.

* Causes ⇒ DR.HIMES

D ⇒ Diabetes Mallitus / Ketoacidosis (DKA)

R ⇒ Renal Insufficiency / Acute kidney / Kidney Injury / Chronic Kidney disease
↳ (Impaired function of kidney & formation of uric acid)

H ⇒ High fat diet → (oxidation → formed Keton Body)

I ⇒ Insufficient metabolism of CHO (Because Break CHO without O_2 ⇒ formed Lactic acid + 2 ATP)

M ⇒ Malnutition / Starvation

E ⇒ Excessive Ingestion of Aspirin (Acetyl Salicylic Acid)
(fat oxidation)

S ⇒ Fever Diarrhoea (Because Altimity alkaline juice excrete)

* C/M ⇒ (Hyperventilation) Kussmaul's Respiration (Regular but ↑se Rate and depth of Respiration)

⇒ Drowsiness, Confussion, Headache, Coma

⇒ Hypotension, warm Flushed skin (vasodilation), Dysrhythmia

⇒ Nausea, vomiting, Abdominal pain, Diarrhoea

* Mgt ⇒ Correct underlined cause

(D) Metabolic Alkalosis ⇒

Def:- ↑se H^+ ion due to abnormal metabolic process.

* Causes:- (MEDHI)

M ⇒ Massive Blood transfussion (Because ↑se amount of citrate ⊖ and convert citrate → Bicarbonate)

E ⇒ Excessive vomiting/GI ducctioning/Antacid (outside acid, inside Base → alkalosis)

D ⇒ Diuretics

H ⇒ Hyperaldosteronism (due to excessive aldosterone and excrete Excessive H^+ ion out of Body)

I ⇒ Ingestion / Infusion of Excess sodo bicarbonate

C/M ⇒

~~Imp~~ ⇒ Hypoventilation

⇒ Drowsiness, Nervousness, Confussion

⇒ Tachycardia, Dysrthymia

⇒ Anorexia. Nausea, vomiting

~~Imp~~ ⇒ Tetany. Tremors. muscle Cramp, tingling in Extermities. ↳ (Involuntary jerky movement)

⇒ Seizure

Mgt

Correct / treat underlining cause.

* Acidosis and Alkalosis is diagnosed / checked By the ABG Analysis ⇒

A → Arterial
B → Blood
G → Gas

* ABG Analysis ⇒

⇒ Sample from Arterial Blood

⇒ Sample collect by the → Radial Artery / Brachial Artery / femoral Artery / ~~radial Artery~~

⇒ Normal value ⇒

primary parameters ⇒
- * pH → 7.35 - 7.45
- * P_{CO_2} → 35 - 45 mmHg
- P_{O_2} → 80 - 100 mmHg
- * HCO_3^- - 22 - 27 mEq/L

secondary Parameter ⇒ ($Hb \rightarrow O_2$)
- SaO_2 = 95 - 100%
- Base Excess = -2 to +2 mmol/L

⇒ Pulse oxymeter checked By → ~~Pa~~ SaO_2

⇒ Sample collect By the radial artery Before Allen's test is done.

* Allen's test ⇒

The test is performe to determine collateral circulation in hand + adequacy of ulnar artery

procedure ⇒ Apply pressure over radial and

Ulnar artery

⇒ Ask pt to open and closely the hand
⇒ Release pressure from ulnar artery

** If pinkness fail to reappear in 6-7 sec., sample should not be drawn from radial artery (Allen's negative) (collect)

⇒ Drawn sample if Allen's test positive.
⇒ Use heparinized syringe to drawn the sample.
(sample → 5-7 ml)

Respiratory Acidosis → PH↓ PCO_2↑
Respiratory Alkalosis → PH↑ PCO_2↓

Metabolic Acidosis → PH↓ HCO_3↓
Metabolic Alkalosis → PH↑ HCO_3↑

$pH \propto \frac{HCO_3}{PCO_2}$ → metabolic indicate
→ Respiration indicate

Eg ⇒ ABG
① pH → 7.49
PCO_2 → 30
HCO_3 → 25
Ans → Respiratory Alkalosis.