



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME: Introduction to Surgery

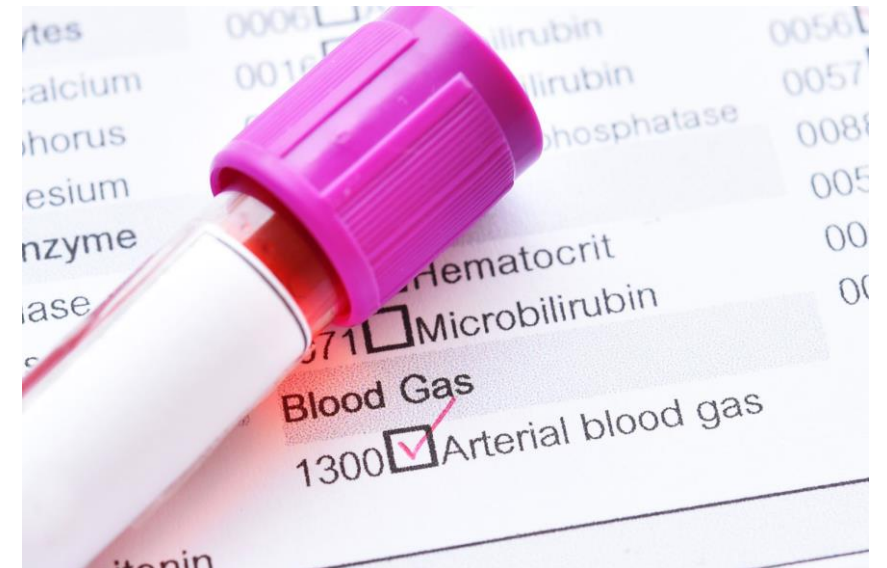
TOPIC : Acid Base Disorders



Case Study



A 50 years old patient, has a complaint of severe diarrhea for the past two days. The patient was admitted in ER was noticed with weakness, dizziness and fainting. The patient was undertaken ABG for diagnosis of acid base disorder. The diagnosis report shows pH 7.50, Pco₂ 55 mm Hg, Po₂ 300 mm Hg and HCO₃⁻ 35 mEq/L. Interpret the condition and management modalities for the patient

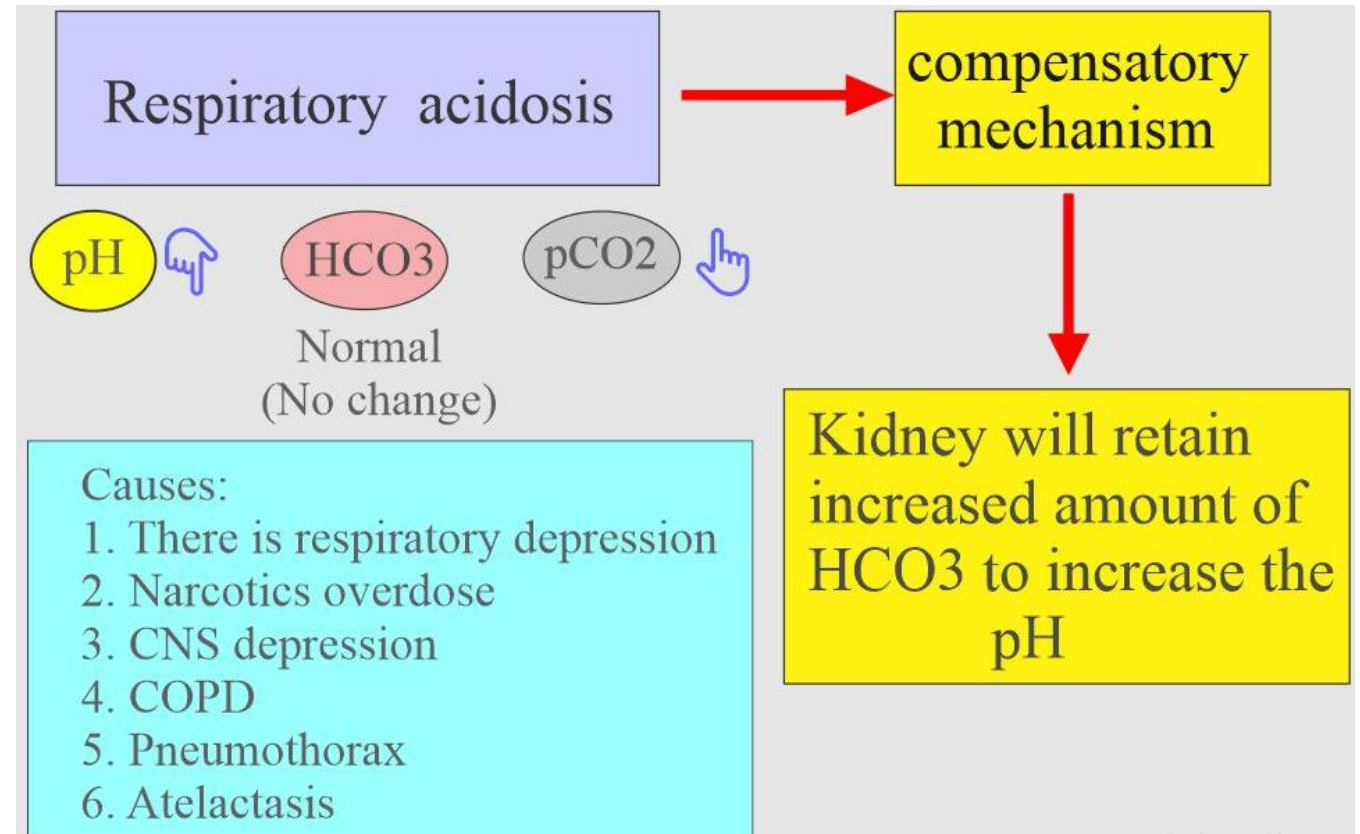




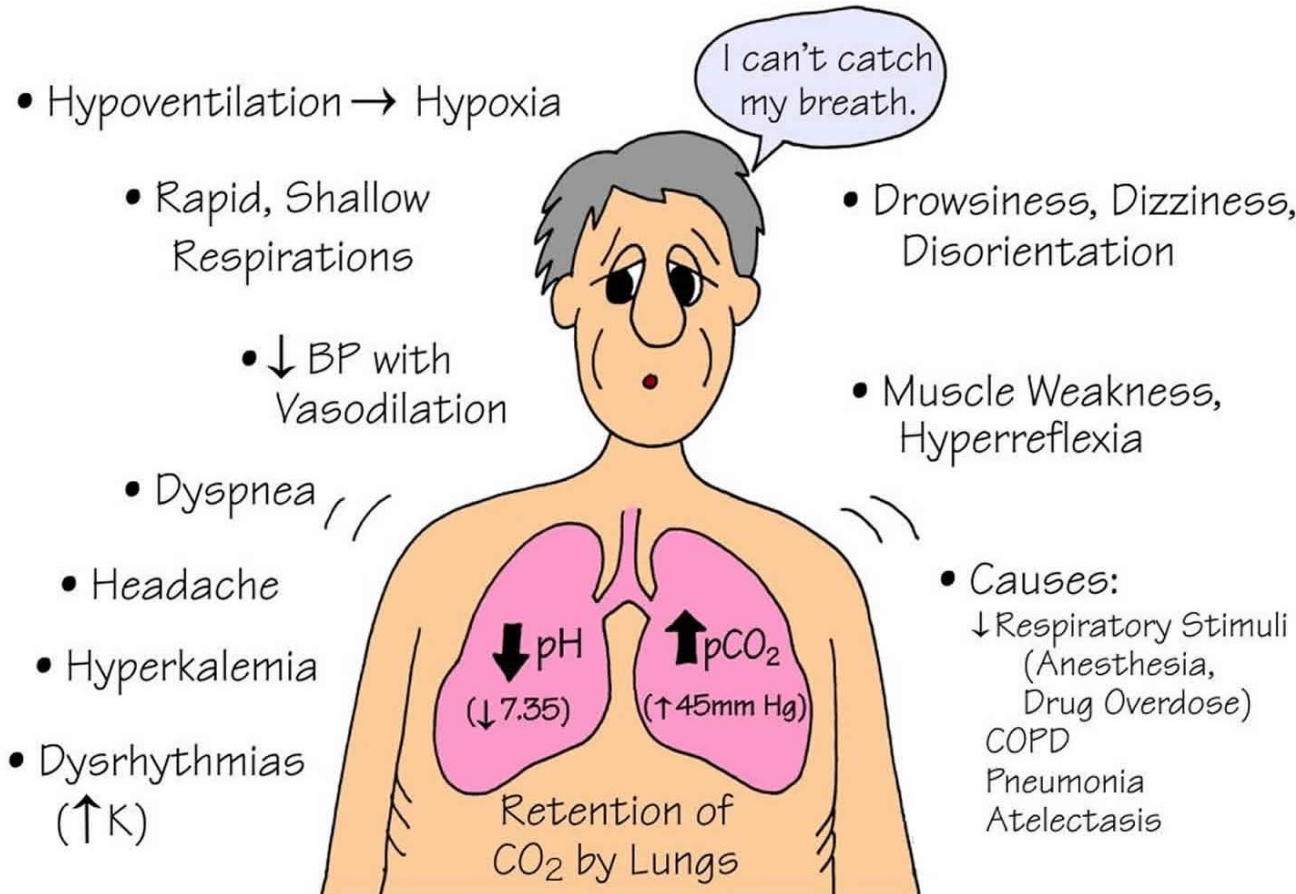
Respiratory acidosis



- pH and HCO_3^- go in the opposite direction.
- pH lower, pCO_2 high, HCO_3^- high.
- Seen in respiratory depression due to any cause.
 - Hypoventilation.
 - Excessive retention of CO_2 .



Respiratory Acidosis - Symptoms and Treatment



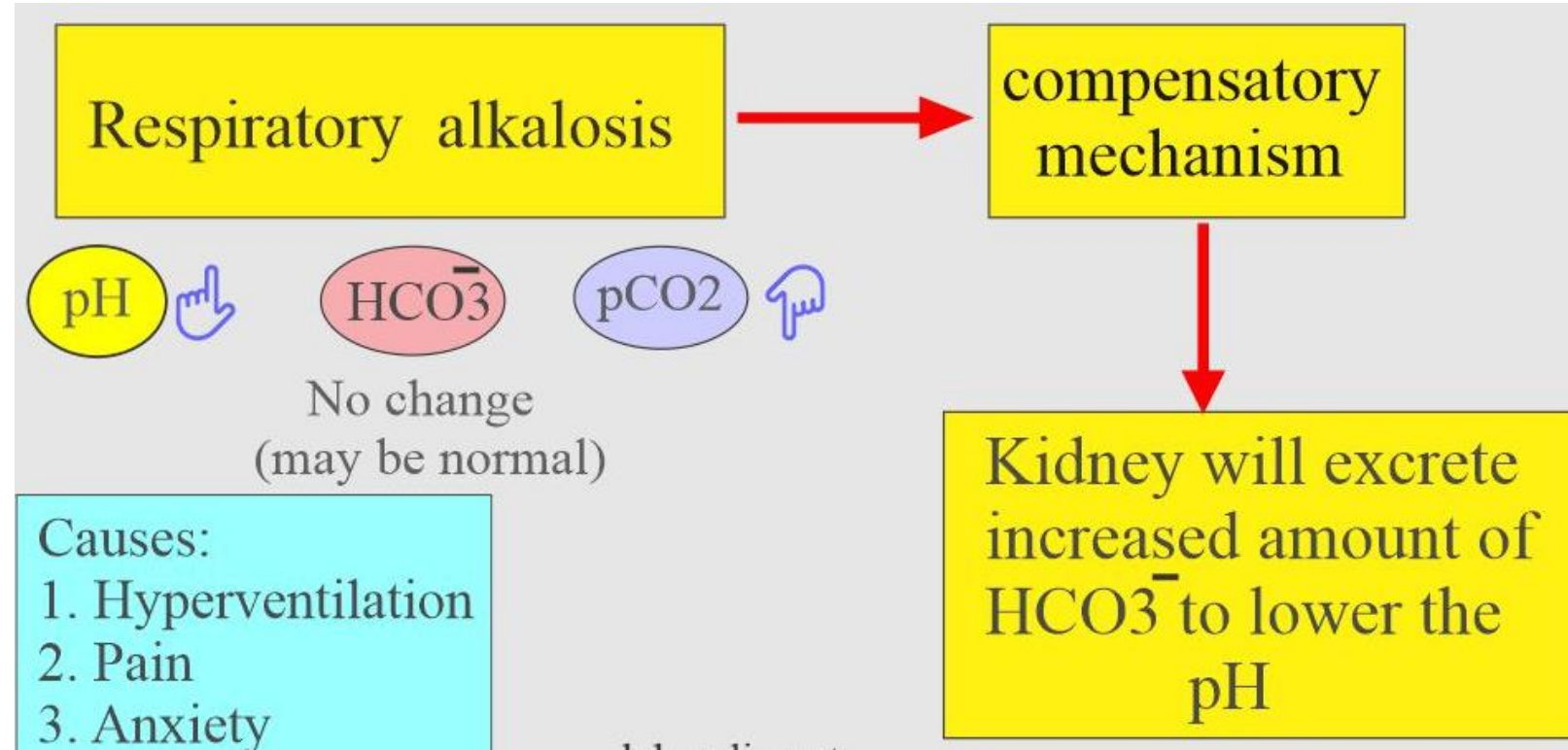
- Treatment of respiratory acidosis usually focuses on correcting the primary disturbance.
- Immediate discontinuation of medications that suppress central respiratory drive
- Noninvasive ventilation or intubation with mechanical ventilation



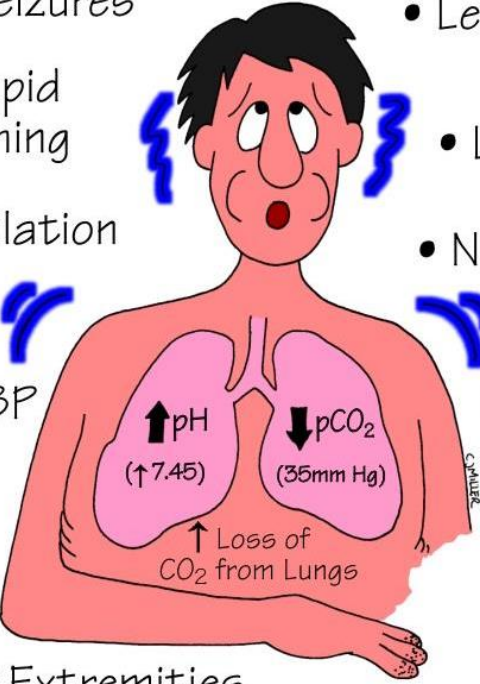
Respiratory Alkalosis



- pH and HCO_3^- go in the opposite direction.
- pH is high. pCO_2 low.
- HCO_3^- is normal or slightly decreased.
 - Seen in hyperventilation.
 - Excessive loss of CO_2 .



Respiratory Alkalosis - Symptoms and Treatment



The diagram shows a person with a distressed expression. Blue lightning bolts indicate symptoms. The lungs are shown with an upward arrow for pH (7.45) and a downward arrow for pCO₂ (35mm Hg). An upward arrow from the lungs is labeled 'Loss of CO₂ from Lungs'.

- Seizures
- Deep, Rapid Breathing
- Hyperventilation
- Tachycardia
- ↓ or Normal BP
- Hypokalemia
- Numbness & Tingling of Extremities
- Lethargy & Confusion
- Light Headedness
- Nausea, Vomiting
- Causes:
 - Hyperventilation (Anxiety, PE, Fear)
 - Mechanical Ventilation

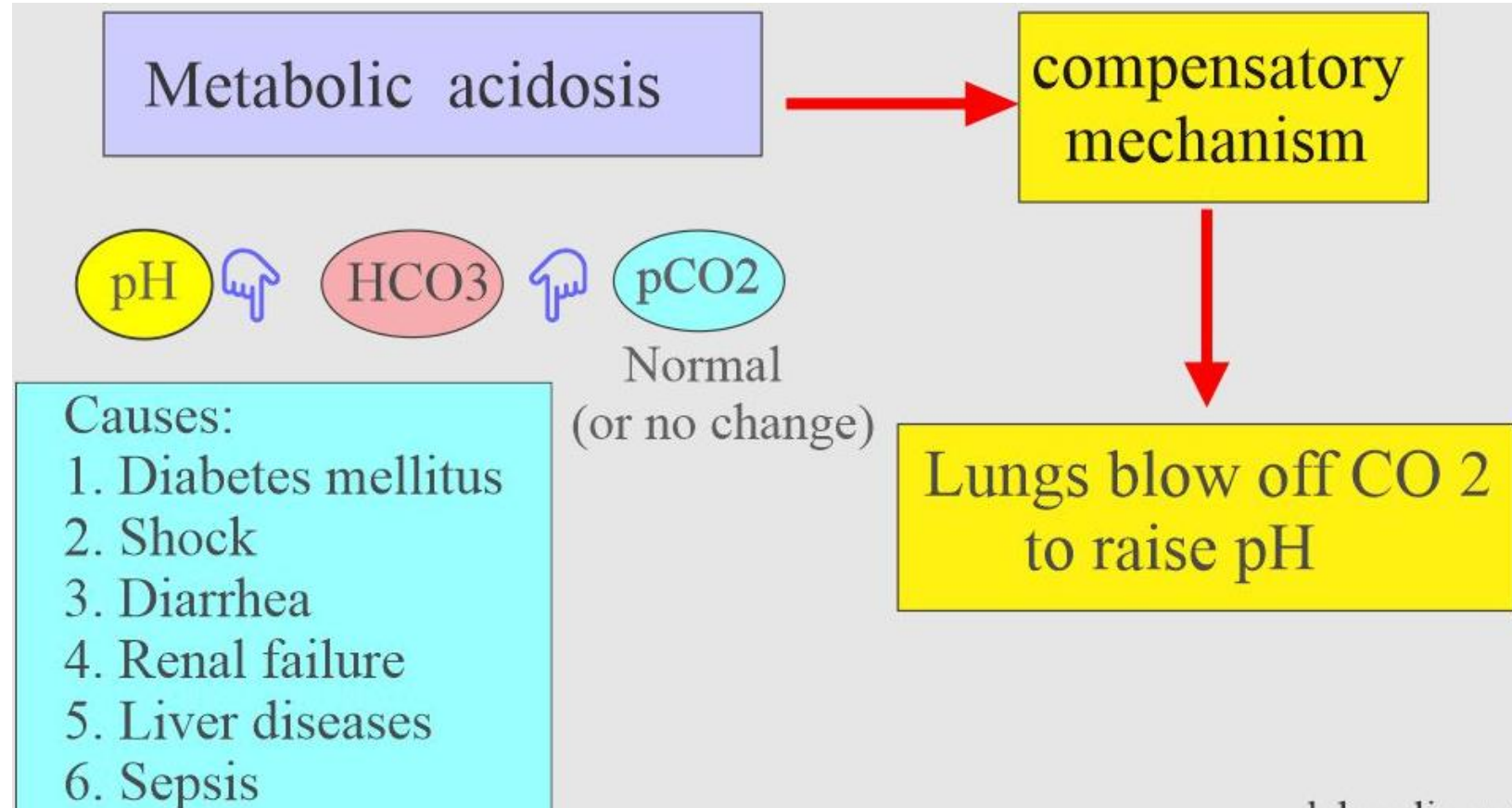
- Treatment of respiratory alkalosis centers on correcting the underlying systemic cause or disorder.
- Acute hyperventilation syndrome often is treated simply by having the patient breathe into a paper bag





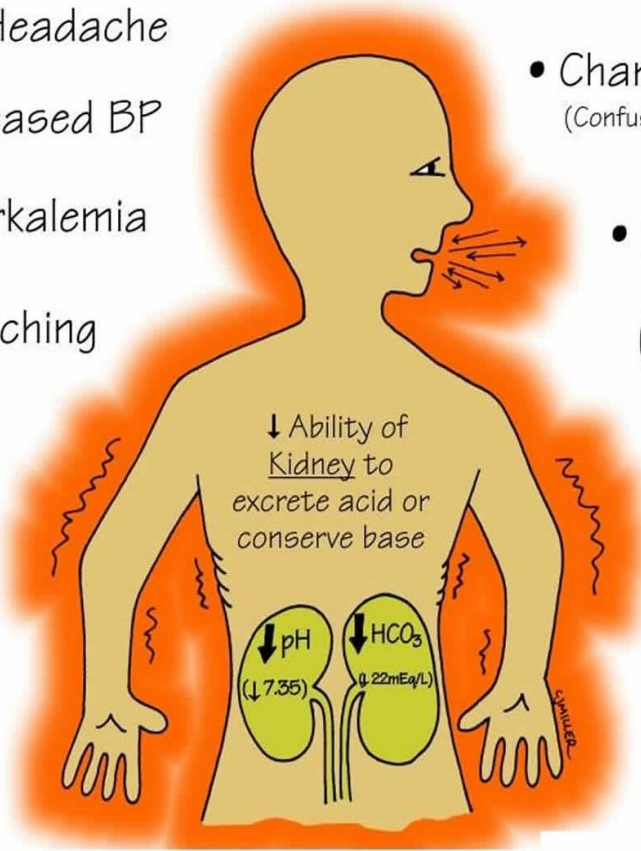
Metabolic Acidosis

- pH and HCO_3^- go in the same direction.
- pH low, pCO_2 low, HCO_3^- low.
- Seen in diabetes, shock, renal failure, and an intestinal fistula.



Metabolic Acidosis - Symptoms and Treatment

- Headache
- Decreased BP
- Hyperkalemia
- Muscle Twitching
- Warm, Flushed Skin
(Vasodilation)
- Nausea, Vomiting, Diarrhea



- Changes in LOC
(Confusion, ↑ drowsiness)
- Kussmaul Respirations
(Compensatory Hyperventilation)
- Causes:
DKA
Severe Diarrhea
Renal Failure
Shock

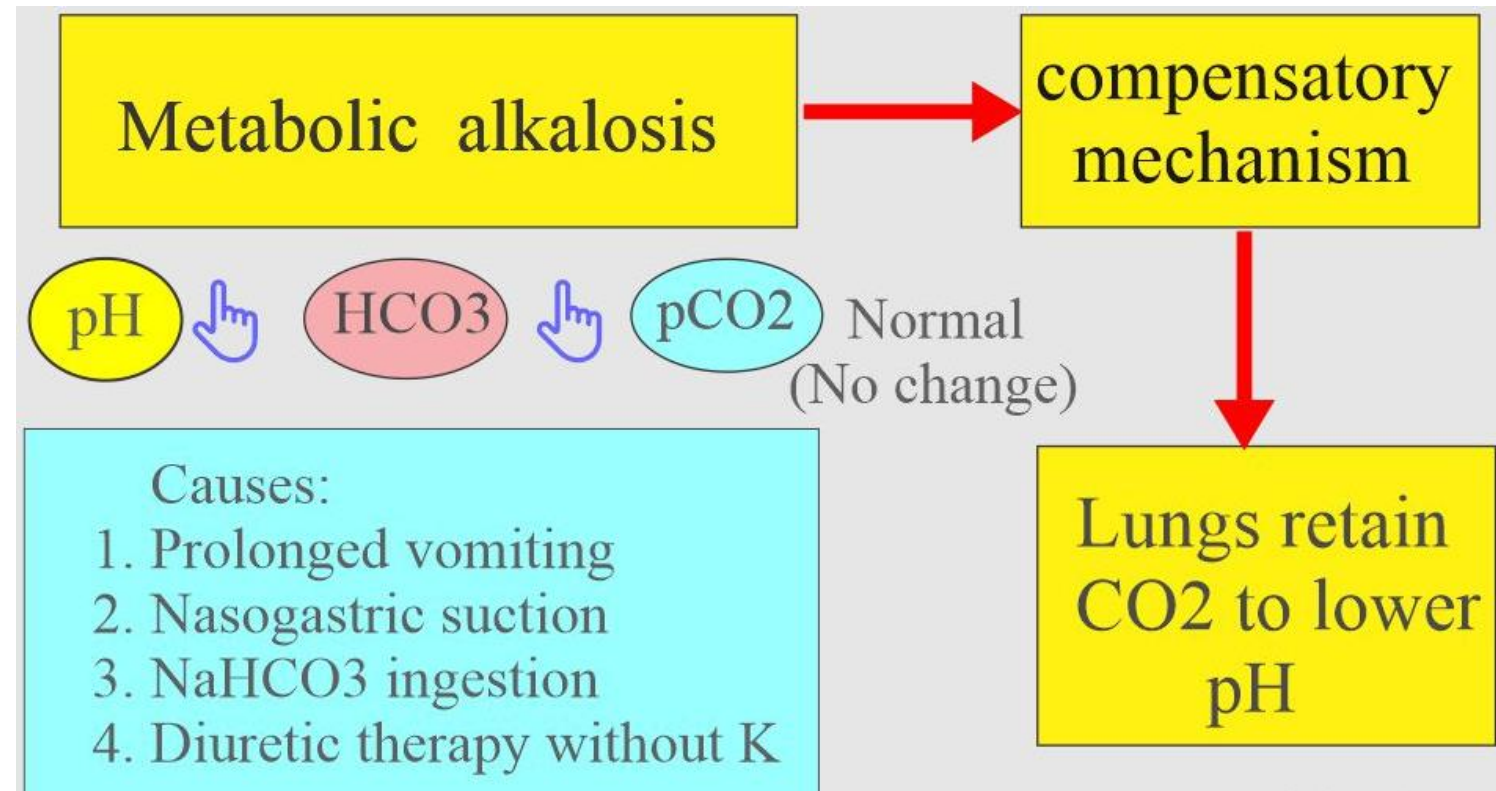
- Use of HCO_3^- therapy to adjust the pH



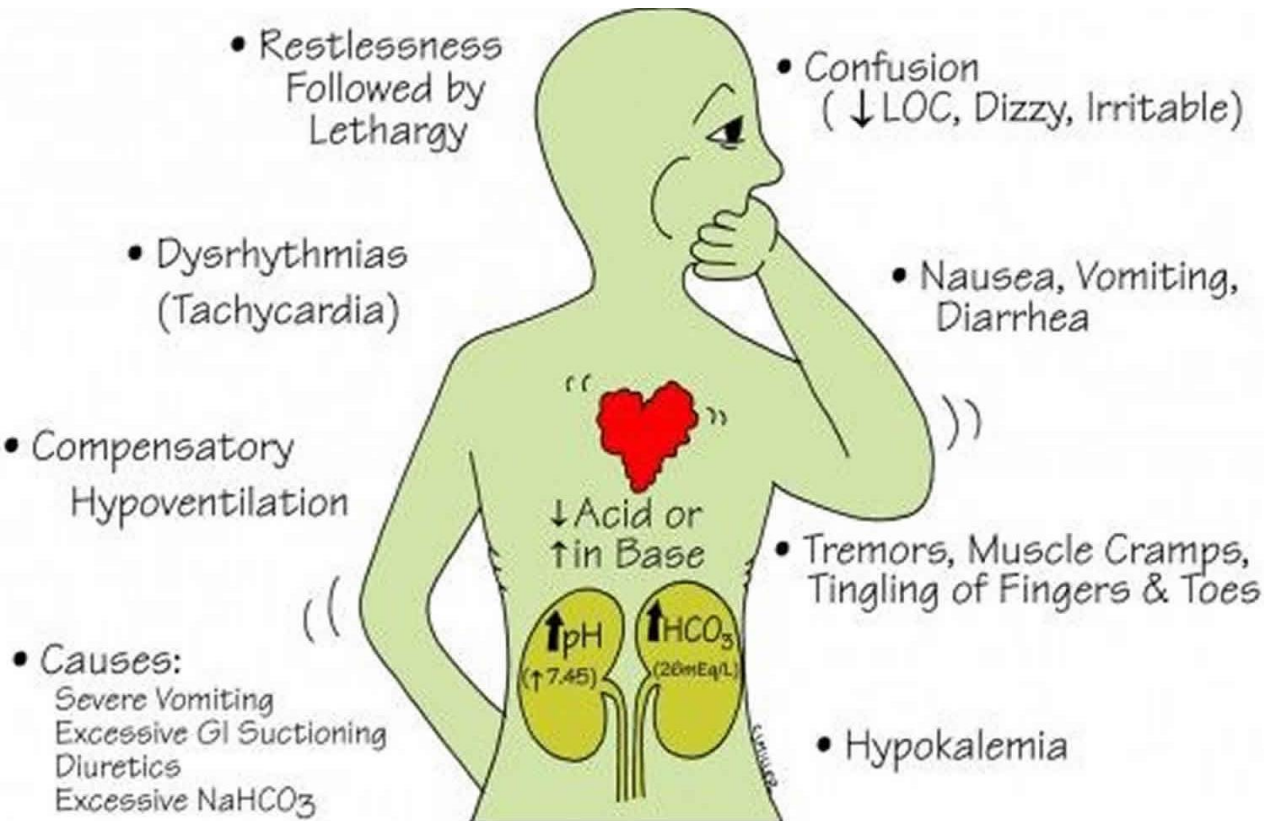
Metabolic Alkalosis



- pH and HCO_3^- go in the same direction.
- HCO_3^- is >30 meq/L.
- pH high, pCO_2 high, HCO_3^- high.
- Urine pH >7.0 (Unless there is severe hypokalemia).
- Serum K is usually low.
- Seen in sodium bicarbonate overdose, prolonged vomiting, and nasogastric drainage.



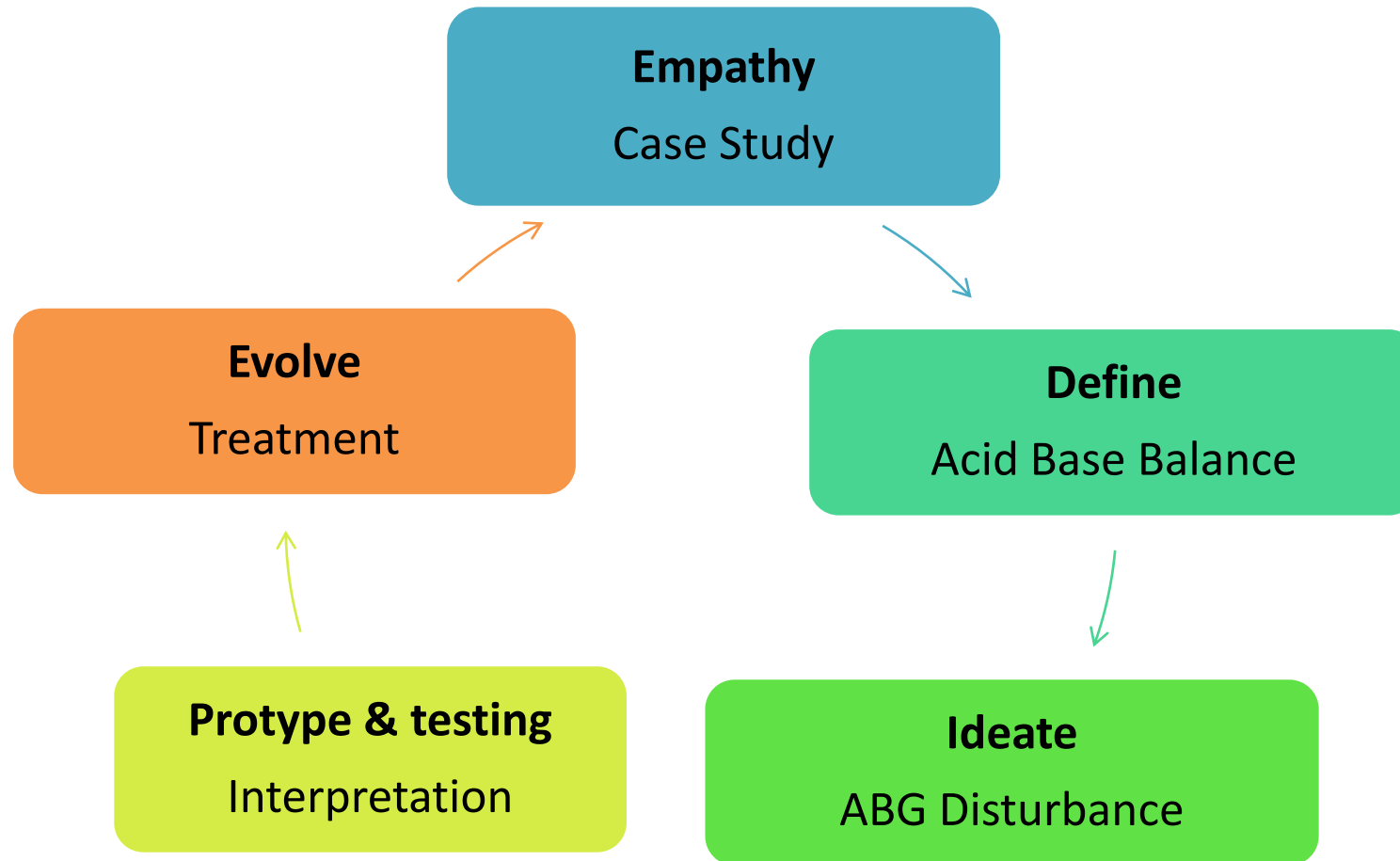
Metabolic Alkalosis - Symptoms and Treatment



- Three general principles apply to the therapy of metabolic alkalosis: **correct true volume depletion, correct K depletion, and correct Cl-depletion**
- Fluid administration of normal saline replaces the Cl- and free water deficits
- Potassium chloride administration for patients who have concurrent hypokalemia
- Method for treating metabolic alkalosis in an edematous patient is to administer acetazolamide



Summary





Thank You



References:

<https://renaissance.stonybrookmedicine.edu/sites/default/files/Acid-Base-Disorders.pdf>

<https://www.nytimes.com/2008/05/13/health/13real.html>