ACID-BASE IMBALANCE DISTURBANCES (CASE STUDIES II)

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Advanced Clinical Biochemistry I

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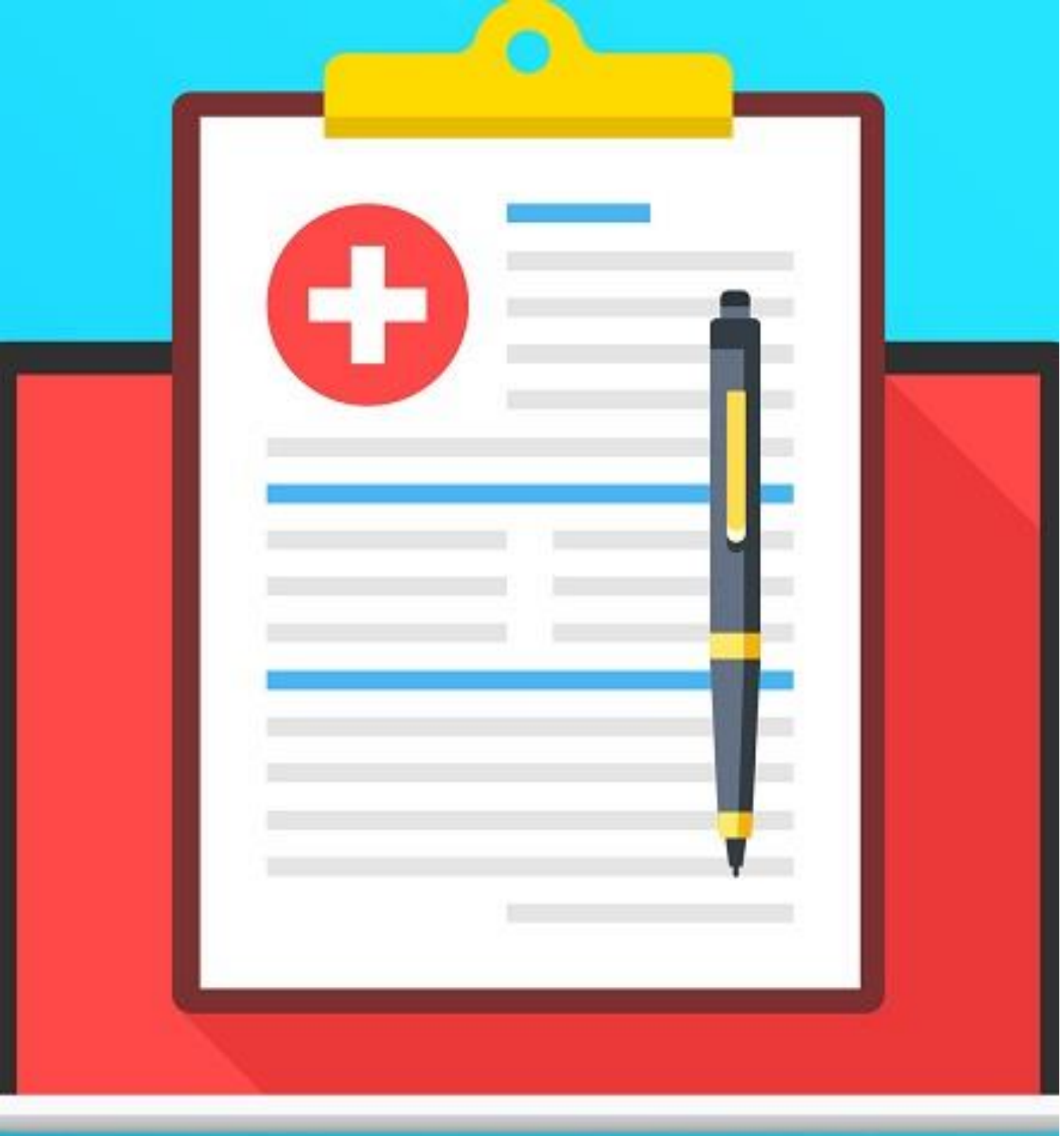
Objectives

- At the end of this lab session, **students should understand:**
- The importance and benefits of clinical case studies.
- How to use critical thinking to provide sustainable solutions to the complex case
- The practical stills for solving case studies



Benefits of case studies

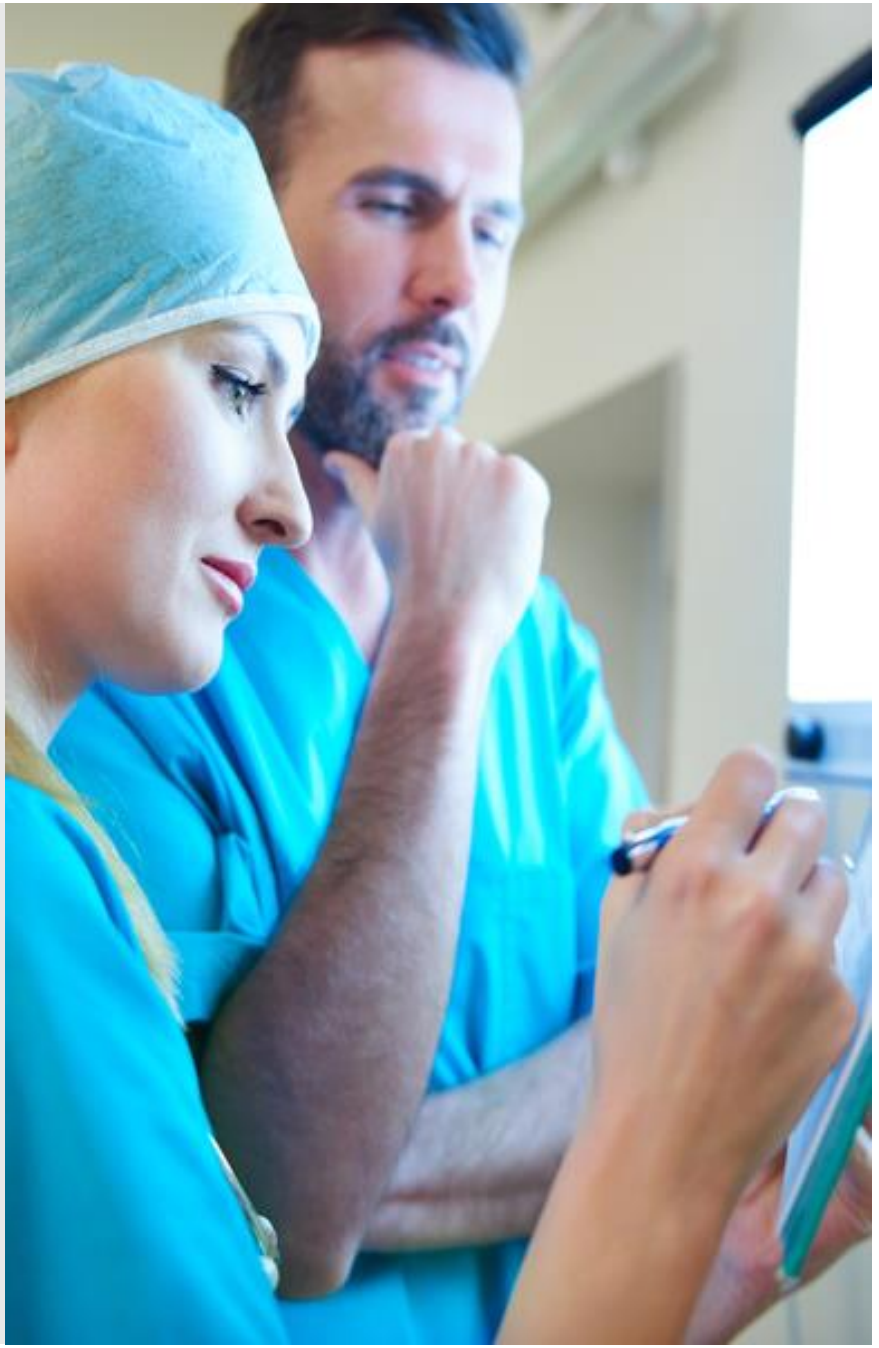
- Case studies promote critical thinking.
- Case studies depict realistic clinical scenarios.
- Case studies increase student participation and enjoyment of learning.
- Case studies are ideal for sharing new information.
- Case studies may improve clinical outcomes

Case one

- A 50-year-old male suffering from pulmonary blockage was brought to an emergency in a critical state with extreme difficulty in breathing and urine passage.
- The blood gas analysis revealed the following

- pH = 6.9
- pCO_2 = 56 mm Hg
- pO_2 = 40 mm Hg
- HCO_3^- = 11 mmol/L

- **Interpret the result in a professional way and suggest the likely clinical condition(s).**



Four Acid-Base Disorders:

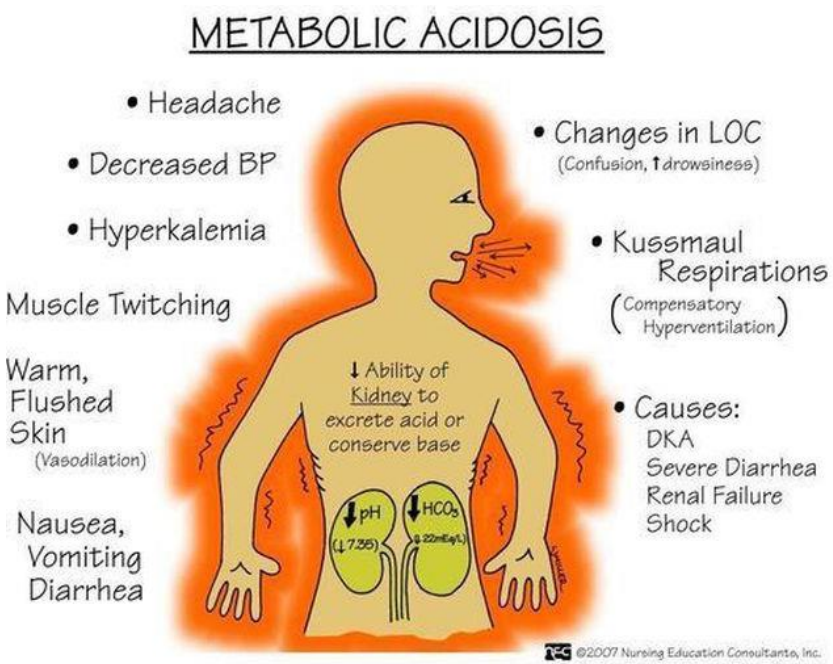
Respiratory

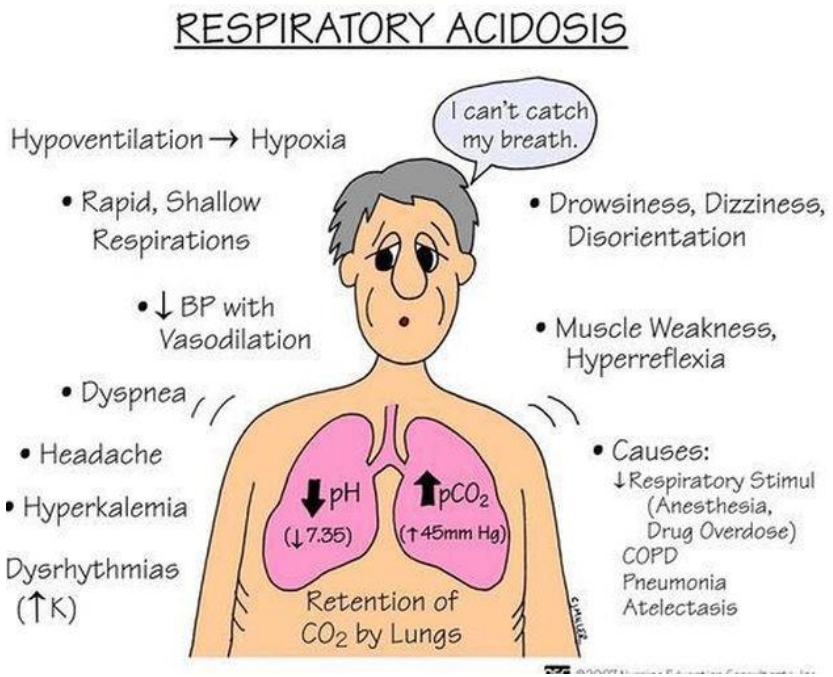
Metabolic

↑ CO_2	Acidosis
↓ CO_2	Alkalosis
↑ HCO_3^-	Alkalosis
↓ HCO_3^-	Acidosis

Normal Range

- pH = 7.35 – 7.45
- pCO_2 = 34 - 44 mm Hg
- pO_2 = 85 - 105 mm Hg
- HCO_3^- = 22 – 26 meq/L





Case Discussion

- Low pH – acidosis.
- Low pO_2 and high pCO_2 signify a primary respiratory problem.
- Low HCO_3^- = (acidosis)
- **Thus, the patient is suffering from both metabolic and respiratory acidosis.**

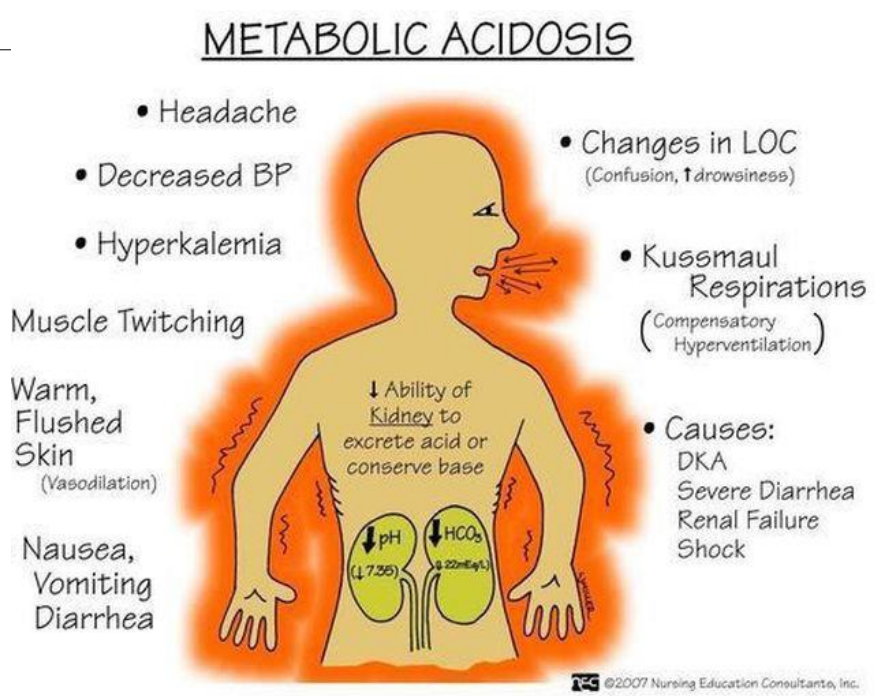
Case Two

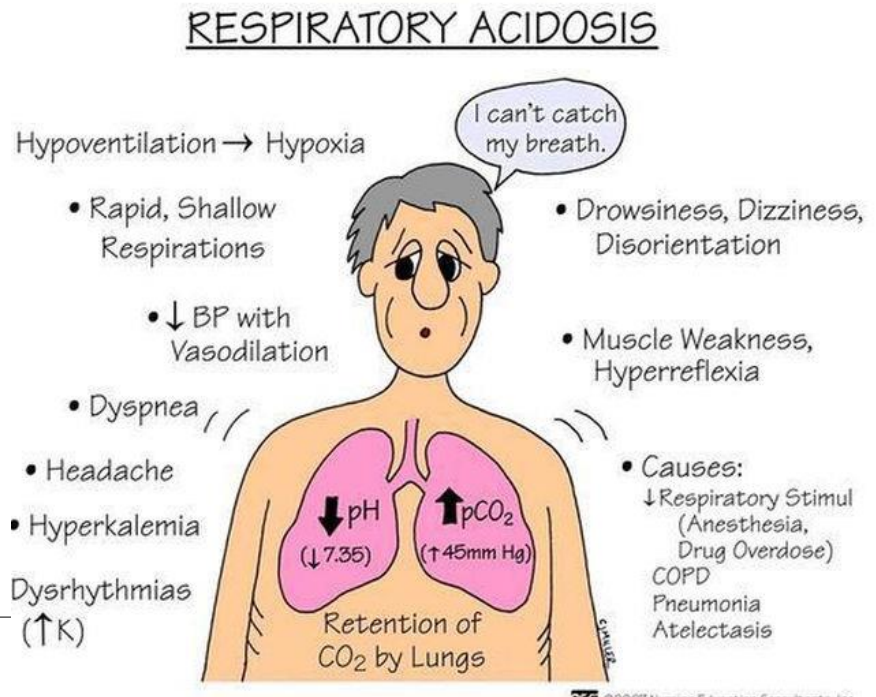
- A new bone baby boy became lethargy and has been refusing breast milk since birth. Phenotypic investigation revealed tachypnea with normal breath sounds. The chemistry test results for Glucose, sodium, potassium, and chloride were all normal except for bicarbonate, which happened to be higher (54 mmol/L).
- The blood gas results were enumerated below:
- pH = 7.53, pO_2 = 99 mm Hg, and pCO_2 = 21 mmHg.

- As a medical analyst,
- Interpret the results above.
- Carefully study the circumstance and suggest a possible diagnosis.

Case Discussion

- The baby is suffering from both respiratory and metabolic alkalosis.



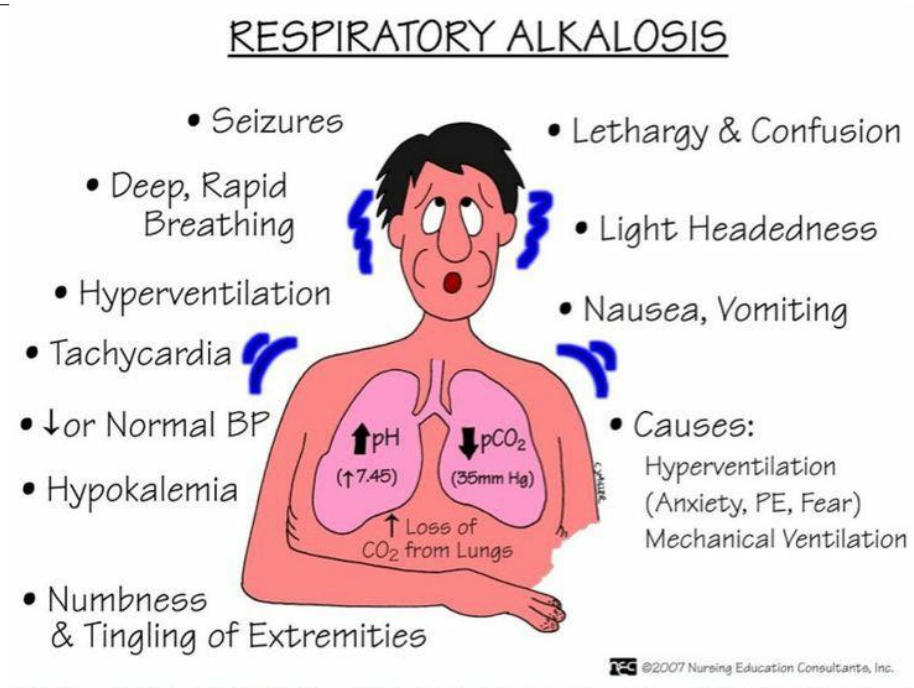


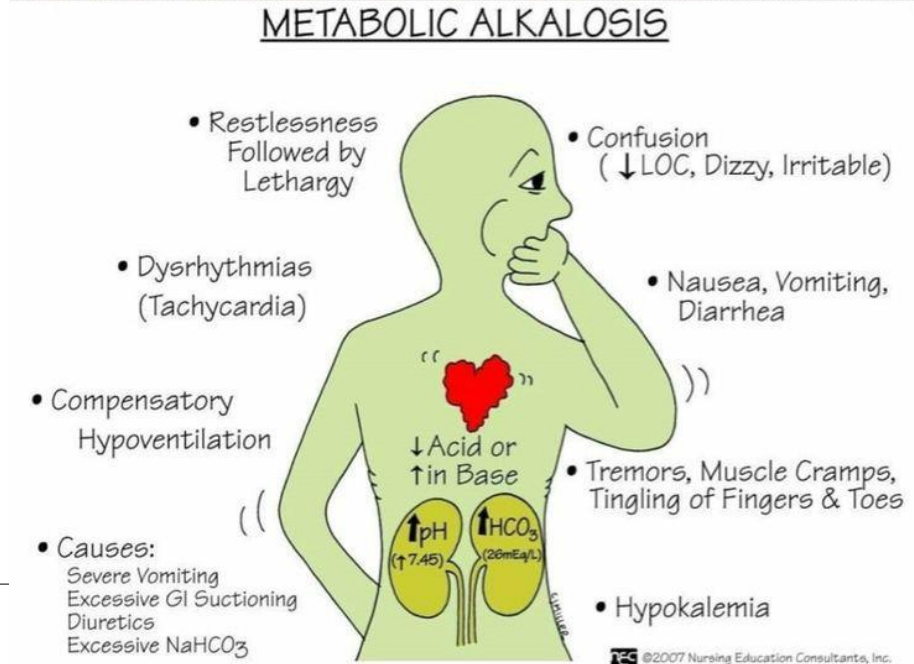
Case three

- A 15-year-old female adolescent reported to a doctor with a nonstop vomit. Upon physical examination, the doctor requested a laboratory investigation for both chemistry and blood gas. The lab results show that, her pCO_2 was extremely low (15 mm Hg), the bicarbonate was higher than normal, the pO_2 was 98 mm Hg with pH 7.52.
- **What is the result interpretation?**
- **Carefully, study the circumstance and suggest the likely disease condition of the patient.**

Case Discussion

High pH, bicarbonate and low pCO2 indicate metabolic and respiratory alkalosis.



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