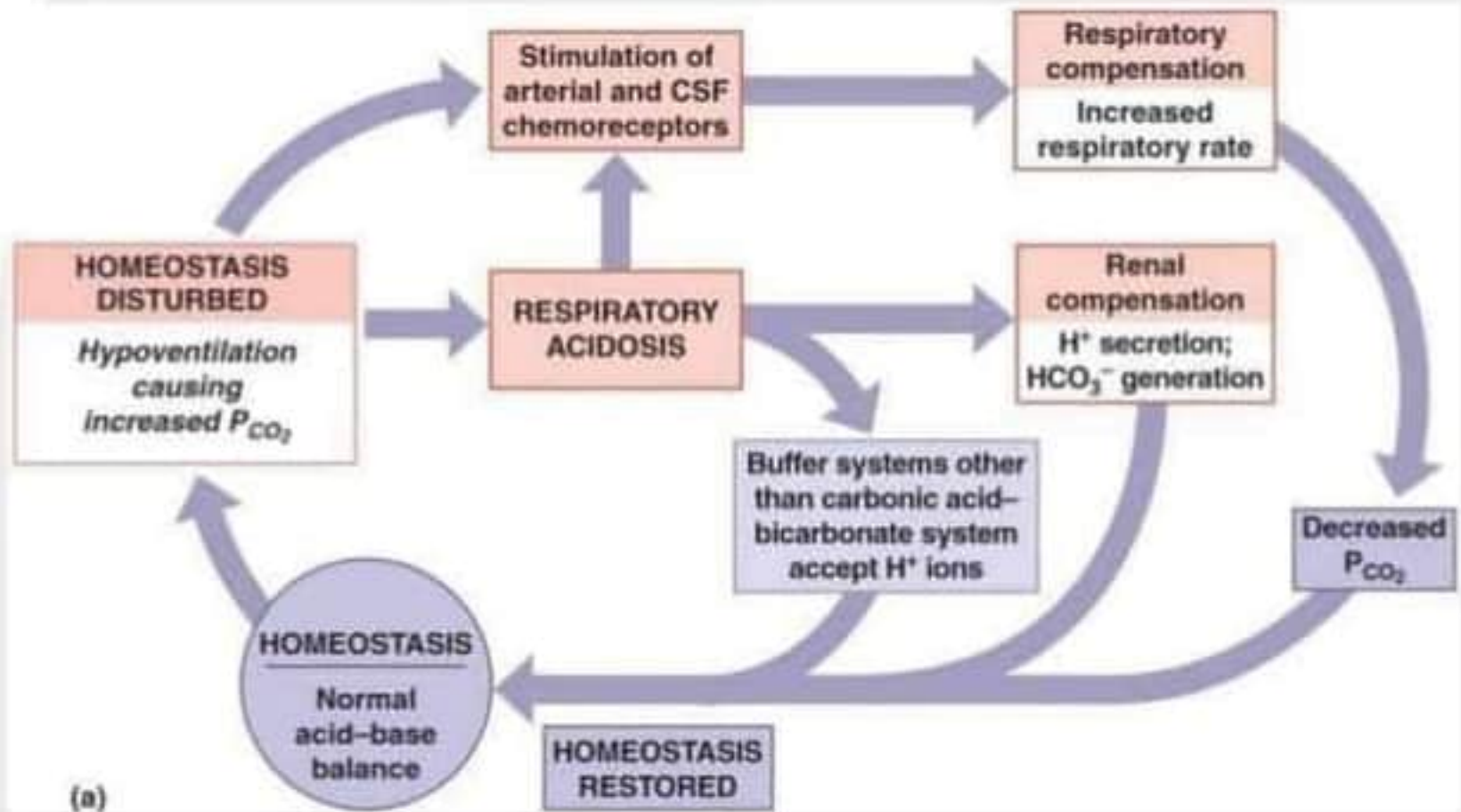










Acid Base Disorders

Disorder	pH	[H ⁺]	Primary disturbance	Secondary response
Metabolic acidosis	↓	↑	↓ [HCO ₃ ⁻]	↓ pCO ₂
Metabolic alkalosis	↑	↓	↑ [HCO ₃ ⁻]	↑ pCO ₂
Respiratory acidosis	↓	↑	↑ pCO ₂	↑ [HCO ₃ ⁻]
Respiratory alkalosis	↑	↓	↓ pCO ₂	↓ [HCO ₃ ⁻]

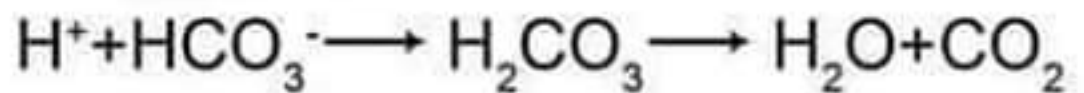
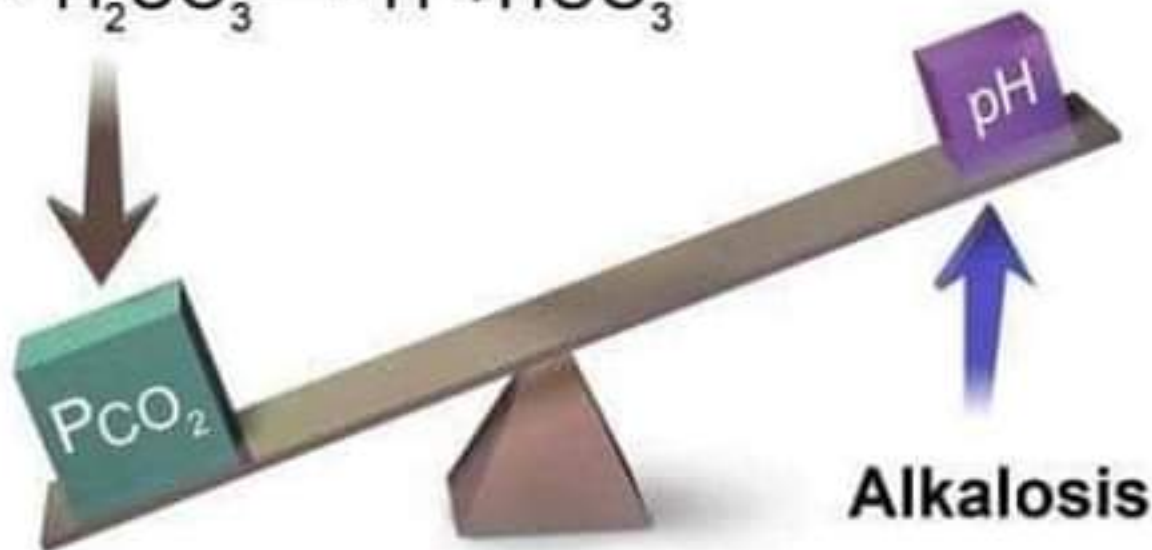
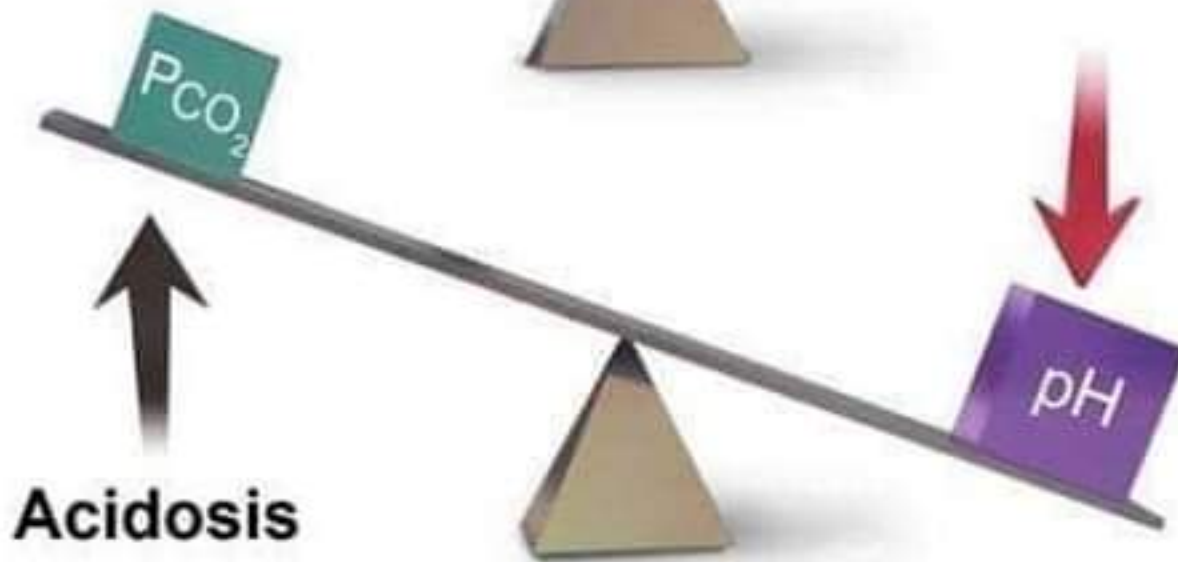
Acid–Base Balance Disturbances



Respiratory Acid–Base Regulation.

ABG	pH	PaCO ₂	HCO ₃
Respiratory Acidosis			normal
Respiratory Alkalosis			normal
Metabolic Acidosis		normal	
Metabolic Alkalosis		normal	

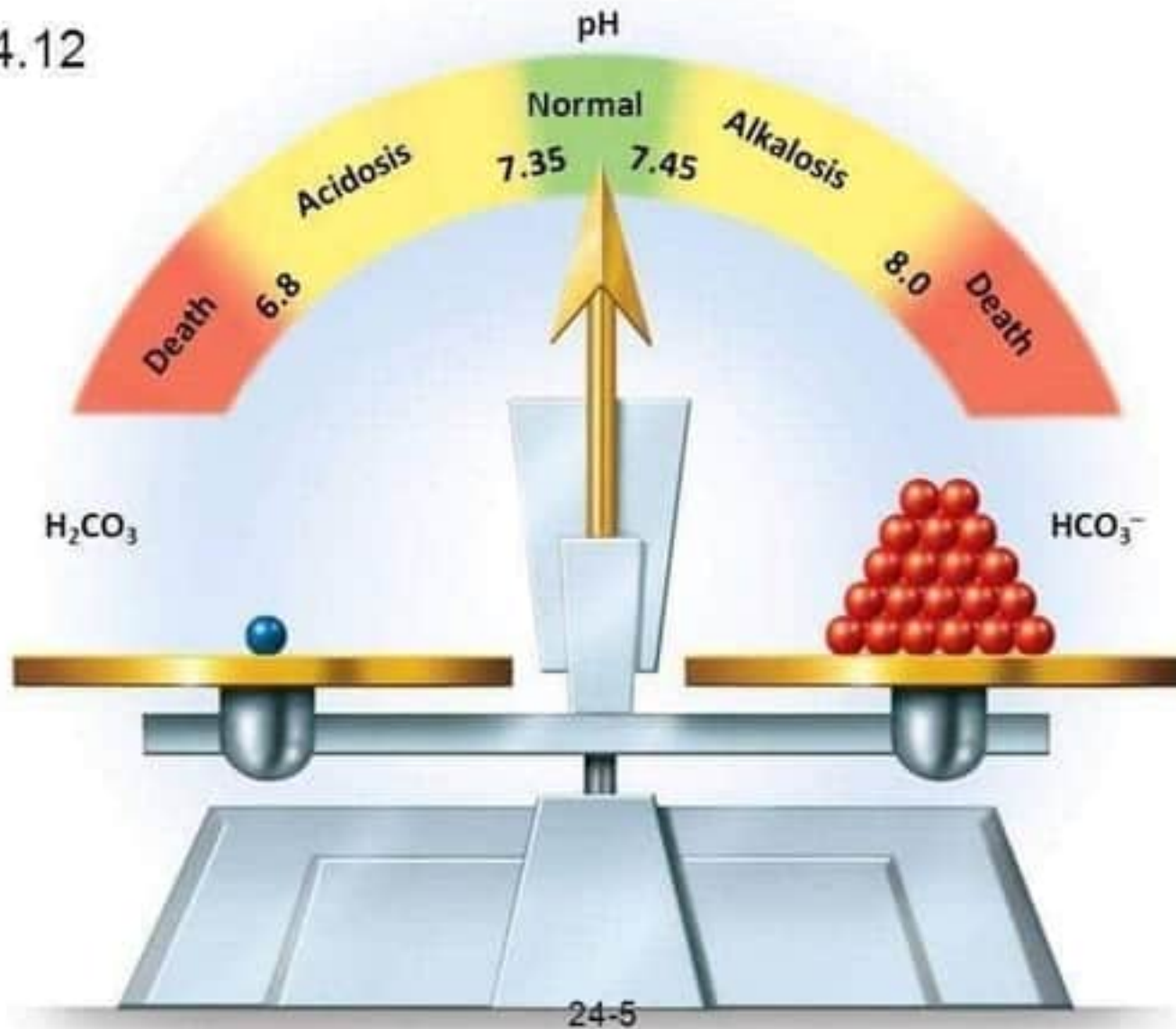
Inverse Relationship between the Partial Pressure of Carbon Dioxide (P_{CO_2}) and Plasma pH



Acid-Base Balance

Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.

Figure 24.12



Inverse Relationship between the Partial Pressure of Carbon Dioxide (P_{CO_2}) and Plasma pH

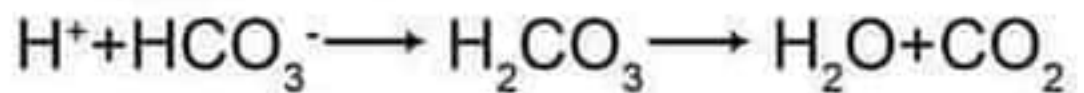
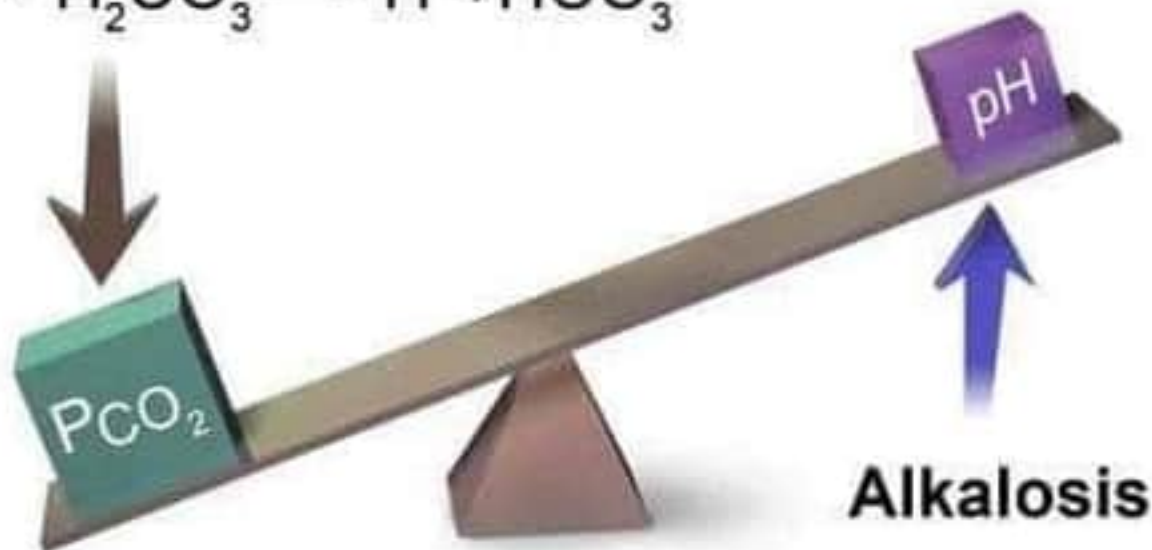
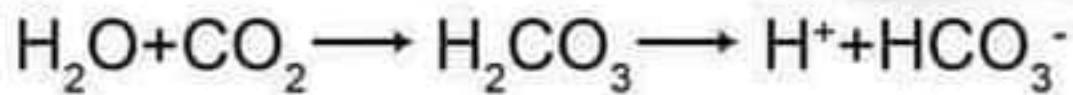


Figure 3: The bicarbonate buffer system.

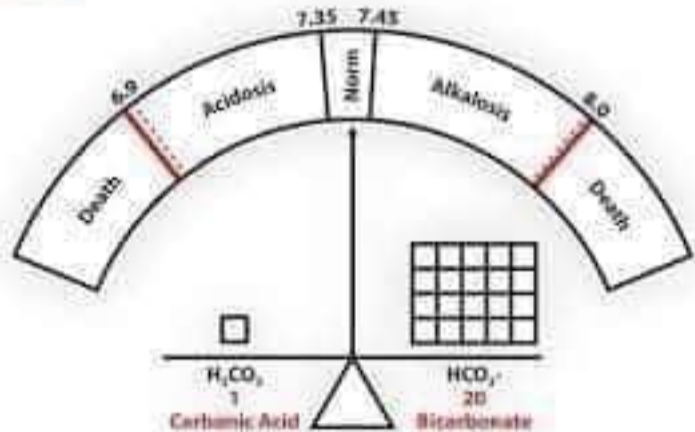


Figure adapted from Camille H. Emergency care in the streets, 2nd ed. Little, Brown and Company, Boston, 1979.



Acid-Base Balance



“ROME”

(**R**espiratory **O**pposite, **M**etabolic **E**qual)

Respiratory= Opposite:

- pH is \uparrow , PCO₂ is down (Alkalosis).
- pH is \downarrow , PCO₂ is up (Acidosis).

Metabolic= Equal:

- pH is \uparrow , HCO₃ is high (Alkalosis).
- pH is \downarrow , HCO₃ is low (Acidosis).



Acid-Base Balance and Blood pH. Acidity and alkalinity are expressed on the pH scale, which ranges from 0 (strongly acidic) to 14 (strongly basic, or alkaline). A pH of 7.0, in the middle of this scale, is neutral. Blood is normally slightly basic, alkaline, with a pH range of 7.35 to 7.45.



Interpretation of Acid Base Disturbance

