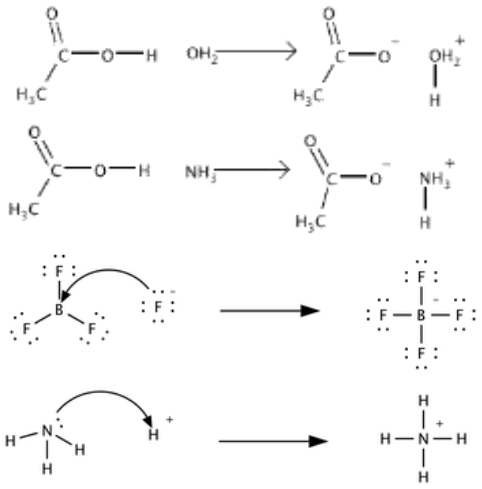
1. Acids and Bases
    a. Definitions
        i. Bronstead- Lowry
            1. _____ donor
        ii. Lewis
            1. _____ acceptor
        iii. Examples



    b. Parameter
        i. pH Scale
            1. pH = _____
            2. Ref. Range =_____
            3. >7.45 =
            4. <7.35=

2. Buffers
    a. How do they work?

b. Biological Buffers

i. Bicarb

1. Bicarb and carbonic acid

a. CO_2 that remains in plasma:

b. CO_2 that diffuses into RBCs

i. *Chloride Shift*

ii. Phosphate

1. Important in:

iii. Proteins

iv. Hemoglobin

3. ONE EQUATION TO RULE THEM ALL!

a. Henderson Hasselbalch

i. pH =

ii. pKa = (at body temp)

iii. Final formula for the Bicarb/carbonic acid buffer:

b. Buffering parameter

i. Base Excess

1. Calculated

2. What does it tell us?

4. Blood Gas Parameters

a. pH

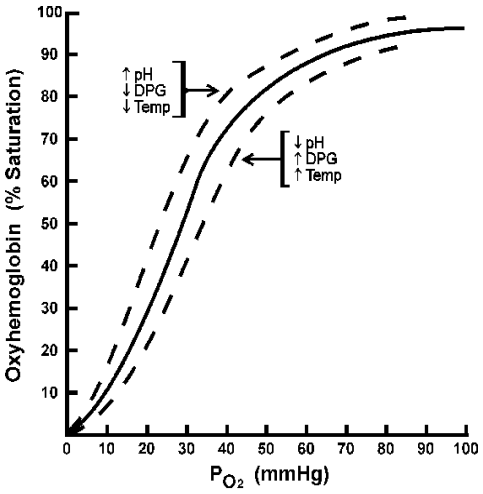
b. pCO_2

c. pO_2

i. Indicates:

ii. Vs. sO_2:

iii. Saturation factors:



1. pH

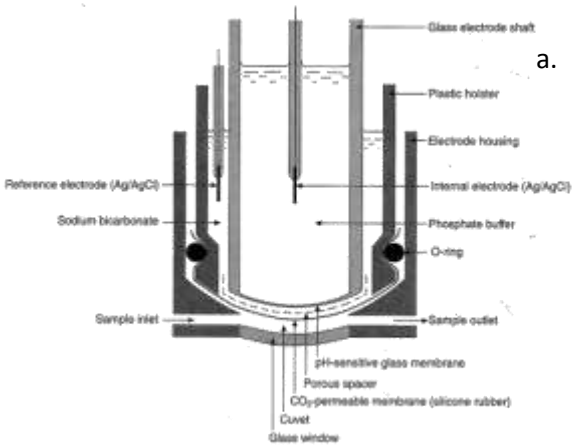
2. 2,3 DPG

3. Temp

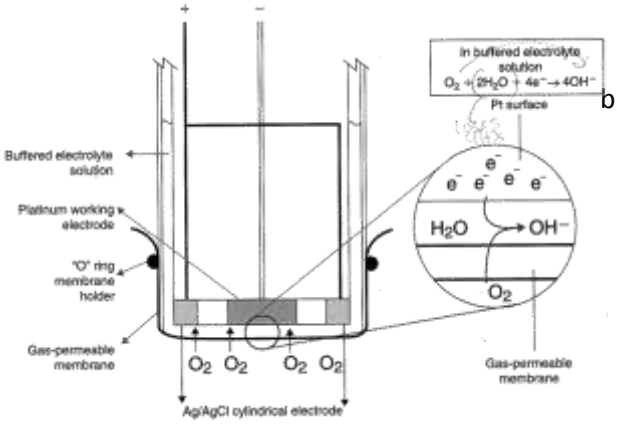
iv. Blood Gas Analyzers

1. Electrodes

a. Potentiometric



b. Amperometric



2. Calculations

    a. Bicarb

    b. BE

    c. % Sat***

v. Calibrating Blood Gas Analyzers

    1. pH

    2. PCO_2 and PO_2

        a. What are the problems with blood gas calibrators?

            i. Thick

ii. Unstable

iii. Aqueous

iv. Flourocarbon?

b. Tonometry

5. Examining Blood Gas Results

a. Always Look at _____ FIRST!

i. >7.45

ii. <7.45

b. Next examine WHY they are that way

i. Metabolic?

1. HCO_3^-

ii. Respiratory?

1. pCO_2

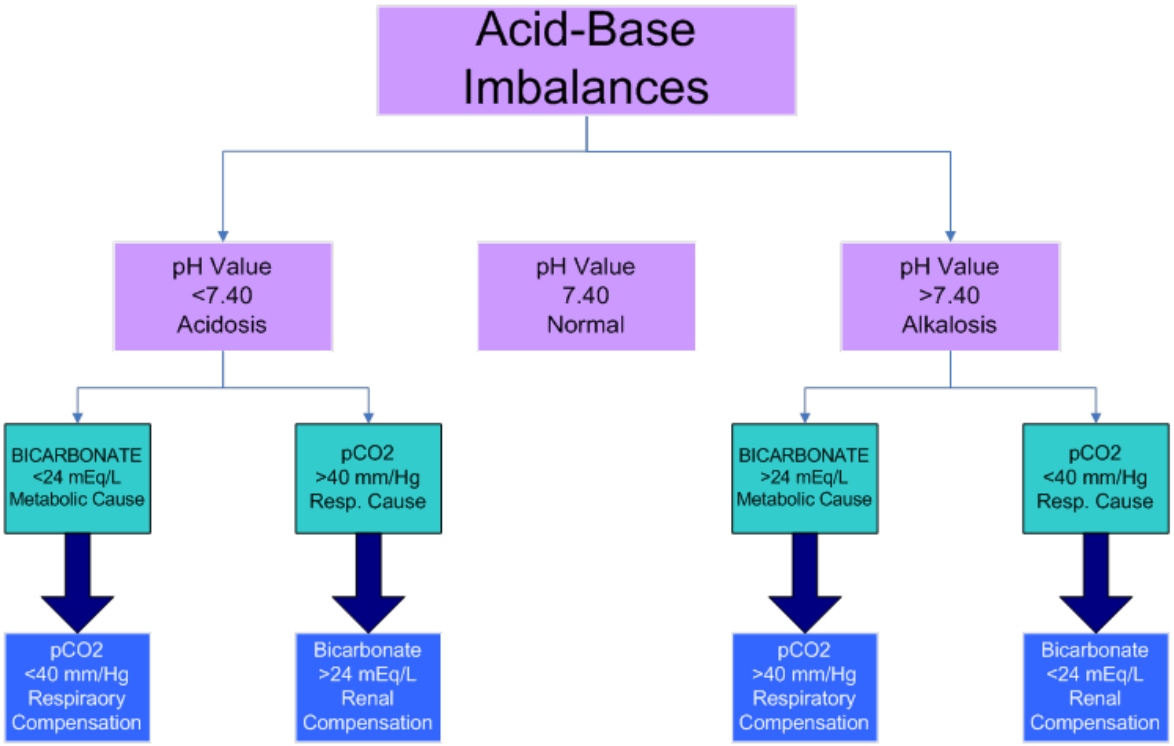
	pH	pCO_2	HCO_3
Resp. Acidosis			
Resp. Alkalosis			
Met. Acidosis			
Met. Alkalosis			

c. If the body is out of balance it WILL try to compensate

i. Compensatory mechanisms are the opposite of the problem

1. If problem is respiratory

2. If problem is metabolic



Case Studies:

A 53 year old sustained major trauma in a motor vehicle accident. A blood gas was collected and the results follow:
pH: 7.53
HCO3: 34 mmo/L
pCO2: 42 mmHg

A 20 year old developed acute renal failure after aminoglycide therapy. An arterial blood gas revealed:
pH: 7.36
HCO3: 16 mmol/L
pCO2: 30 mmHg

A hospitalized 72 year old with COPD and an upper respiratory infection showed an arterial blood gas:
pH: 7.30
pCO2: 60 mmHg
HCO3: 22 mmol/L