**Differences Between Adults and Children**
- Differences in acid/base balance can happen really quick and be life threatening
- Percentage and distribution of body water; lose water more quickly than adults b/c of a higher BMR
- Body surface area is greater
- Rate of basal metabolism is increased
- Status of kidney function; infants can concentrate or dilute urine; difficulty conserving body water; infant requires more body water per kg of body weight than an adult; urine will be consistently yellow regardless of hydration status

**Total Body Water**
- Intracellular fluid (30-40% of body weight)
- Extracellular fluid (20-25%)
- Interstitial (15%)
- Plasma (5%)
- Infant is 80% of body weight as water; extracellular fluid is much higher in infant than in adult
- Adult is about 50% TBW; about 65% in children, about 80% in infants

**Fluid Maintenance**
- 100 ml/kg for 1st 10kg
- 50 ml/kg for next 10 kg (11-20)
- 20 ml/kg for remaining kg

**Osmosis**
- Movement of pure solvent, such as water, from lower concentration to an area of higher concentration.
- Example is boiling of a hot dog. The concentration of the solutes inside the hotdog is greater than in the water, so the skin of that water is acting as a semi-permeable membrane. This allows water to go into the hotdog. When the hotdog cannot hold any more water, it ruptures.

**Electrolyte Imbalances**
- Sodium
    - Normal 135 to 145
    - major ECF electrolyte
- Potassium
    - Normal 3.5 to 4.5
    - major ICF electrolyte
- Chloride
    - largely in ECF

*When child is vomiting, they lose fluid from ECF...that's mainly where all their water is. They also have higher water loss from skin and lungs d/t higher surface area.*

**Types of dehydration.**
- Types of Dehydration
    - Hypotonic: Na loss > water loss...water moves into the cell causing the cell to be puffy. Na level < 130
    - Isotonic: Na & water loss equal (most common type of dehydration)
    - Hypertonic: water loss > Na loss...the water leaves the cell causing the cell to shrink. Na level > 150; this is the most dangerous type of dehydration; more difficult to manage
- Dehydration results from ECF loss; very common

**Types of IV solutions**
- Isotonic – 0.9% NS, LR, D5W
- Hypotonic —water
- Hypertonic —D5 1/2 NS, D5 LR, D10W

**Adding Potassium to the IV**
- Why do we do this? We can't conserve potassium...vomiting, gastric suctioning, intestinal fistulas, diarrhea can cause a severe potassium loss.
- Signs of low K?
    - weakness, inability to move right, floppy muscles/limbs

**Acid-Base Balance**
- Normal blood pH = 7.35 to 7.45
- Acidosis: blood pH < 7.35
- Alkalosis: blood pH > 7.45
- Respiratory acidosis: can be caused by slow or shallow breaths (CO2 goes up)
- Respiratory alkalosis: mechanical overventilation, but don't do ABGs often in kids unless on vent; numbness in toes, confusion
- Metabolic acidosis:
- Metabolic alkalosis

**Degrees of Dehydration**
- Two different ways to measure dehydration
    - Change in body weight or body water

| | Mild | Moderate | Severe |
|---|---|---|---|
| **Infant** | < 5% wt<br>< 50 ml/kg | 5-10% wt<br>50-90 mg/kg | > 10% wt<br>> 100 ml/kg |
| **Child** | 3% wt<br>30 ml/kg | 6% wt<br>60 ml/kg | 9% wt<br>90 ml/kg |

- Mild to moderate: oral rehydration is the treatment; but in ED they'll get IV b/c it's faster

- Assessment for dehydration
    - Skin for color,
    - warmth, turgor
    - Cap refill, HR,
    - peripheral pulses, BP (late sign)
    - Mucous membranes dry, no tears
    - LOC, fontanel, eyes
    - I & O, weight, urineoutput & specificgravity

Treatment of Dehydration
- Oral rehydration therapy therapy (ORT)
    - For mild to moderatedehydration
    - Pedialyte, Lytren, Infalyte, Resol
- IV fluids: 20ml/kg bolus NS

Hockenberry, Marilyn J.. *Wong's Essentials of Pediatric Nursing*. Seventh Edition ed. St. Louis: Mosby, 2005. Print.

*Parsh, B. (2010, March 11). Fluids & Electrolytes. Pediatric Nursing. Lecture conducted from CSU Sacramento, Sacramento*

*Sampson, J (2010, March 11). Fluids and Electrolytes. Pediatric Nursing. Lecture conducted from CSU Sacramento, Sacramento.*

*Tobar, K. (2010, March 11). Fluids and Electrolytes. Pediatric Nursing. Lecture conducted from CSU Sacramento, Sacramento.*