H's & T's

❖ Hypovolemia – Low volume
  ➢ Diagnose
    • BP (Normal 120/80)
    • Distal Pulses
    • Altered Mental Status
    • Cap. refill (Normal 1-2 sec)
    • Narrow Complex (ECG)
    • Rapid rate (ECG)
    • History
    • Flat neck veins
  ➢ Treatment
    • Crystalloid or colloid fluids or blood
    • Correct cause (blood loss, etc.)

❖ Hypoxia – Low oxygen
  ➢ Diagnose
    • SPO₂ (Normal 94%-100%)
    • Skin color
    • Respiratory rate (Normal 12-20 per minute)
    • Labs
    • Slow rate (ECG)
    • Airway problems
  ➢ Treatment
    • Administer O₂
    • Consider advanced airway, suction, and bronchodilators
    • Correct cause (lung tissue disease, etc.)

❖ Hydrogen Ion – Low blood pH (Normal Arterial – 7.35-7.45, Normal Venous 7.31-7.41)
  ➢ Diagnose
    • Labs
    • Smaller-amplitude QRS complexes (ECG)
    • History of diabetes, bicarbonate-responsive preexisting acidosis, or renal failure
  ➢ Treatment
    • Metabolic
      • Fluids
      • Sodium Bicarb
      • Correct cause (hypoglycemia, etc.)
    • Respiratory
      • Administer O₂
      • Correct Cause (Lung tissue disease, etc.)

❖ Hypo-/Hyperkalemia – Low / High Potassium (Normal – 3.5-5.0 mEq/L)
  ➢ Diagnose
    • Labs
    • Low
      • T waves flatten
      • Prominent U waves
      • QRS widens
      • QT prolongs
      • Wide-complex tachycardia
      • Abnormal loss of potassium
      • Diuretic use
- High
  - T waves taller and peaked
  - P waves get smaller
  - QRS widens
  - Sine-wave PEA
  - History of renal failure, diabetes, recent dialysis, dialysis fistulas
  - Medications
  - Treatment
    - Correct Cause (kidney malfunction, etc.)
    - Low
      - IV Potassium
      - Add magnesium if cardiac arrest
    - High
      - Calcium Chloride (Helps the heart)
      - Glucose and Insulin (lowers potassium)
      - Sodium Bicarbonate
      - Possibly albuterol
- Hypothermia – Low body temperature (less than 95°F / 35°C)
  - Diagnose
    - Rectal Temperature
    - J or Osborne waves (ECG)
    - History of exposure to cold
  - Treatment
    - Warming blankets
    - Warm fluids
- Toxins: tricyclics, digoxin, B-Blockers, calcium channel blockers
  - Diagnose
    - Labs
    - Pt Hx
    - Prolonged QT interval
    - Bradycardia
    - Empty bottles at scene
    - Pupils
    - Neurologic exam
  - Treatment
    - Reversal Agents
- Cardiac Tamponade – Fluid in the pericardium
  - Diagnose
    - Beck’s Triad
      - Hypotension
      - JVD
      - Muffled Heart Sounds
    - Narrow complex (ECG)
    - Rapid rate (ECG)
    - No pulse felt with CPR
    - History
  - Treatment
    - Pericardiocentesis
- Tension Pneumothorax – Air in the pleural space
  - Diagnose
- Penetrating chest trauma
- Progressive respiratory distress
- Unilateral rise and fall of chest
- Diminished breath sounds on one side
- JVD or tracheal deviation
- Narrow complex (ECG)
- Slow Rate (ECG) (hypoxia)
- Difficulty ventilating
- No pulse felt with CPR

✔ Treatment
  - Needle Decompression
  - Tube thoracostomy

❖ Thrombosis, lungs: Massive pulmonary embolism
  ✔ Diagnoses
    - Narrow complex (ECG)
    - Rapid Rate (ECG)
    - No pulse felt with CPR
    - Distended neck veins
    - Prior positive test for deep vein thrombosis or pulmonary embolism
    - History
    - Ultrasound
    - Venography
  ✔ Treatment
    - Surgical embolectomy
    - Fibrinolytics

❖ Thrombosis, heart: Acute, massive MI
  ✔ Diagnoses
    - Abnormal 12-lead ECG
      - Q waves
      - ST-segment changes
      - T waves, inversions
    - History
    - Cardiac markers
    - Good pulse with CPR

❖ Trauma
  ✔ Diagnose
    - Trauma Assessment
    - History
  ✔ Treatment
    - Correct Cause