CONDITION/DISEASE PROCESS	FLUID AND ELEC IMBALANCE
DIABETES INSIP S • Metabolic disorder • S/S Excessive fluid intake and hypotonic polyuria • Failure of ADH secretion (most common reason) Failure of kidneys to respond to ADH (least common reason) • Dehydration if fluids not replaced	**ypernatremia** – loss of H2O. Both Na+ and water are lost but mo vater the If pt drinks lg amts of water then Na+ will not go up. **Hypovolemia** Dehydration if lost water not replaced
DIABETIC KETOACIDOSIS – DKA Insufficient insulin so can't metabolize glucose Instead metabolic needs met by fat – excessive ketones (acid) result Ketones accum in ECF, H+ driven into cells, K+ driven out Lungs attempt to compensate – deep rapid breathing (Kussmauls) Kidneys attempt to excrete excess acid in urine Cz'd by insufficient insulin; or illness, infxn, sx, stress	**Hyperkalemia** – H+ driven into cells, K+ driven out and also insulin moves K+ i cells so less insulin, less K+ in vascular space BUT **Hypokalemia** – osmotic diuresis overcomes above **Hyponatremia** – osmotic diuresis Hypophosphatemia – osmotic diuresis, insulin therapy causes phosphorus to m into cells **Metabolic Acidosis – DKA** Ketones accum in blood **Hypovolemia (dehydration)** Massive fluid loss from osmotic diuresis
HEART FAILURE Heart can't pump enough blood to meet metabolic demands **Left sided** (usually first side to fail) (this is CHF) (Commonly leads to Right sided HF) • Left ventricle can't propel blood volume forward (↓CO) and (left atrium and pulmonary veins back up) • Pulmonary circ becomes engorged, ↑capillary pressure pushes Na+ and H2O into interstial space (impaired gas exchange –cyanosis and S?S of hypoxia) (Pulmonary edema – orthopnea, cough w/ frothy sputum, nocturnal dyspnea) **Right sided** • Right ventricle has hard time propelling blood into pulmonary circ (because of left sided engorgement of pulm circ) • Blood backs up and causes pressure and congestion in vena cava & systemic circ • ↑ cap pressure forces excess fluid into interstitial space causes edema & ascities • Liver congestion (S&S r/t impaired liver fxn) • GI tract congestion (anorexia, GI distress, wt loss – but edema so wt gain) • Ultimately cerebral edema and death	**Hyperkalemia** – K+ sparing diuretics **Hypokalemia** – Prolonged use of K+ wasting diuretics w/ out replacement **Hypo Mg++** - diuretic use **Hypernatremia** – if diuretic use produces more water loss then Na+ loss **Hyponatremia** – Na+ loss from diuretics **Hypochloremia** – diuretic use **Respiratory Acidosis** Impaired gas exchange (↑CO2) **Metabolic alkalosis –** May result from excessive diuretic use leading to HCO3 retention May result from ↓circulating blood volume **Hypervolemia** ↓CO, down perfusion, so kidneys↑ aldosterone (retention of H2O and Na+) **Hypovolemia** Associated w/ overaggressive diuretic therapy

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INTESTINAL OB .UCTION Interference w/ normal peristalsis May occur from obstruction or impairment of bowel innervations Partial or complete blockage of intestinal lumen Fluid, air, gas collect near site Peristalsis temp ↑(squealing bowel sounds) Intestinal mucosa injury Distention Bowel secretes H2O, Na+, K+ into fluid pooled in lumen Cz'd by adhesions, cancer, hernia (strangulated), foreign body, compression, obstruction	**espiratory acidosis –** Marked abdominal distention ↓ventilation **Metabolic Acidoss** Results from vomiting larger amts of alkaline intestinal fluid then gastric fluid **Metabolic alkalosis –** Upper intestine obstruction may cause excessive vomiting of gastric fluid **Hypovolemia** Trapped fluid in intestines, prolonged vomiting, gi suctioning, third space shift
PANCREATITIS • Non-bacterial inflammation of pancreas • Acute and chronic disease forms • Autodigestion by NZ normally secreted for digestion (leads to peripancreatic edema & fluid loss from blood to retroperitoneal space) • NZ released from inflamed pancreas can cause internal burn severe enogh to equal burn to 50% of BSA causing fluid shift from ECF Cz'd by alcoholism, biliary tract disease, trauma, drugs, cysts or tumors (pancreatic)	**Hypocalcemia** – r/t hypoalbuminemia associated w/ protein rich fluid leaking i the peritoneal cavity (from where??? The pancrease??/) **Hypo Mg++** - deposit of Mg++ into inflamed tissue, thought to be r/t hypoalbuminemia, loss from gi suction, vomit etc **Hypophosphatemia** – may result from respiratory alkalosis **Respiratory acidosis –** Pancreatic NZ leakage r/t hpoxemia and pleural effusion, other resp complicati Severe pain - hypoventilation **Respiratory Alkalosis** resp complications severe pain – hyperventilation **Metabolic alkalosis –** Frequent or GI suction **Metabolic Acidosis –** Poor tissue perfusion **Hypovolemia** Fluid shift from ECF to retroperitoneal space and peritoneal cavity

CONDITION/DISEASE PROCESS	FLUID AND ELEC IMBALANCE
RESPIRATORY F .URE Lungs can't maintain adequate gas exchange Leads to excessive CO2 retention Cz'd by Brain: anesthesia, drug overdose, head trauma Lungs: copd, massive bilateral pneumonia, obstruction, asthmatic crises Muscles and nerves: amyotrophic lateral sclerosis, MS, spinal cord trauma Pulmonary circ: Heart failure, pulmonary edema, pulmonary embolism	**lyperkalemia** – K+ moves out of cells to balance elec neutrality if .dosis **Hypokalemia** – K+ moves into cells if alkalosis **Respiratory Acidosis** CO2 retention Respiratory Alkalosis Rapid breathing **Metabolic Acidosis –** Hypoxia causes cells to resort to anaerobic metabolism **Hypervolemia –** Possibly caused by Increased fluid absorption from pulmonary cap pressure or permeability **Hypovolemia –** Excessive water loss caused by fever or any condition that increases metabolis which increases resp rate
SIADH May result from various disorders such as damage to hypothalamus, heart failure ADH triggered by something other then ↓serum osmolality and/or volume	**Hyponatremia** – water retention and ↓aldosterone (kidneys don't secrete ren because volume of perfusion is good) **Hypervolemia (overhydration- hypotonic)** Water retained