Renal system study guide

Science, Anatomy

Renal System Study Guide Med/Surg I Major Functions of Kidney: Regulation of Homeostasis -Filters blood & regulates contents (water content & blood volume) -Maintain acid-base balance -Control fluid & electrolytes -Excrete metabolic waste products -Control BP (renin-angiotensin-aldosterone) Urinary System Structure: Kidneys (produce urine), Ureters (transport urine to bladder), Bladder (stores urine), Urethra (conduct urine outside body) *Nephron- working unit of kidney *Kidneys receive 25% of cardiac output= approx. 1 Liter GRF= 125ml/min & increases at night Renal Hormones: ADH- works in DISTAL CONVOLUTED TUBULE Aldosterone- made in ADRENAL CORTEX ANP- inhibits secretion of renin-angiotensin-aldosterone & water absorption by kidney tubules Erythropoietin- stimulates marrow to make more RBC's Renin- made & released in JUXTAGLOMERULAR APPARATUS RENIN-ANGIOTENSIN-ALDOSTERONE decreased renal perfusion= low BP ; JGA releases renin ; Liver releases angiotensin I ; Lungs convert angio I to angiotensin II ; Increase in BP due to VASOCONSTRICTION, myocardial contractility, VOLUME INCREASE becase ALDOSTERONE is released by ADRENAL CORTEX ; Aldosterone causes sodium & water to be REABSORPTION & potassium excretion **** This stops once BP is normal because it is a NEGATIVE feedback system Lab Tests/Diagnostics: Creatnine- 0. 6-1. 2 End product of muscle & protein metabolism -reflects GFR, renal disease is the only condition to increase creatnine level (not effected by hydration status) BUN- 8-16 measures amount of urea (byproduct of protein metabolism in liver) -factors affecting BUN: hydration/ urine flow, hypoperfusion, metabolic rate, drugs, diet Elevated BUN with normal creatnine= DEHYDRATION/Volume depletion/low perfusion -Elevated BUN &

Creatnine= RENALFAILURE/Dysfunction Specific Gravity- 1. 003-1. 030 measures ability of kidneys to concentrate urine -increased spec. grav = (more concentrated urine) dehydration, low perfusion, too much ADH -decreased sep. grav = (less concentrated urine) too much fluid, diabetesinsipidus, or inability of kidneys to concentrate urine Creatnine Clearance- evaluates how well kidneys remove creatnine from blood -best estimate for GFR renal threshold of glucose = blood glucose level of at least 180 before it spills over in urine *bacturia- males 10, 00 colonies, females 100, 00 colonies of bacteria Renal Calculi/stones: Causes: dehydration, infection, change in urine pH, obstruction, diet, immobilization, metabolic factors S/S: CVA (Costal-vertebral angle) pain, N, abdominal distention, fever, chills, hematuria, pyruria DX: KUB, US, Urine cx, stone analysis, serum calcium & phosphorus to detect hormonal problems TX: hydration/push fluids, abx, toradol (relaxes ureters), diuretics NSG: strain urine, stone analysis, push fluids 3-4L/day, teach diet & s/s of obstruction

Acute Poststreptococcal Glomerulonephritis - bil. inflammation of glomeruli Causes: Strep infection, impetigo S/S: edema, azotemia, hematuria, oliguria, fatigue, HTN, na retention DX: elevated ASO (antistreptolysin-O titer), elevated electrolyte, BUN,& Creatnine, KUB-bil kidney enlargement TX: relief of symptoms, bedrest, fluid & sodium restrictions, abx, daily BUN & creatnine, diet- high calories, low protein sodium potassium & fluids. Acute Pyelonephritis sudden bacterial inflammation of kidney risk factors: urinary stasis, inablility to empty bladder (BPH/enlarged prostate), obstruction, sex, pregnancy, DM S/S: urinary freq. & urgency, dysuria, hematuria, elevated temp, chills, flank pain, anorexia, malaise UA: show pyuria, hematuria, low

spec. gravity, alkaline pH, proteinuria, gycosuria, kentonuria TX: abx, analgesic, reculture urine 1 week after abx complete NSG: antipyretics, increase fluids, monitor for fever

Nephrotic syndrome -clinical manifestations caused by protein wasting secondary to diffuse glomerular damage usually afterstressto immune system s/s: proteinuria, low albumin, edema, hyperlipidemia, hypovolemia nsg: low protein high calorie diet, i/o's, sodium & fluid restriction, weights, treat underlying cause Renal Failure Prerenal- obstructs flow to kidneys ex: CV disease, hypovolemia, peripheral vasodilation, severe vasoconstriction Intrarenal- poisions kidney tissue x: acute glomerular nephritis, pyelonephritis, sickle cells, lupus Postrenal- bladder obstruction, treteral obstruction S/S of Acute Renal Failure: anorexia, uremic breath, oliguria, n/v/d -elevated BUN/creatnine & K+ -low pH, Bicarb, Hgb & Hct Tx: reestablish effective renal function, high calorie diet, diet low in protein sodium & potassium, restrict fluid, vitamin supplements, MONITOR FOR HYPERKALEMIA NSG: i/o's, monitor electrolytes, h, & vitals, check for pericarditis, small frequent meals BPH (Benign Prostatic Hyperplasia) prostatic growth that may block urethra -blockage can cause UTI's, delayed urinary emptying detrusor muscles weakends results in urinary retention-- pt unable to urinate can cause uremia, bladder rupture & peritonitis TURP (Transurethral Resection of Prostate) -surgery that uses a resectoscope to go in urethra & clip out portions of prostate -continous bladder irrigation to prevent clots nsg: keep penis clean. never remove foley, Kegel exercises