Nothing to Declare

Laboratory Values in the Elderly

Sodium (Na)

- Hypernatremia
  - $>150 \text{ Nmol/L}$
  - Usually due to dehydration
  - Older persons may have inadequate compensatory mechanisms of thirst and oliguria in the face of fluid deprivation.
  - ~20 – 30% of elderly will be dehydrated
  - Infection, fever, diarrhea, and cerebrovascular accidents
Hyponatremia

- Na <135mmol/L
- Most common electrolyte disturbance in elderly.
- ~10-20% of patient's in geriatric units will have hyponatremia
  - can be due to disease and drugs
  - Associated with cancer, treatment with diuretics, amitriptyline, phenothiazine, congestive heart failure, SIADH, primary polydipsia
  - Tricyclic antidepressants, disulfiram, haloperidol, serotonin reuptake inhibitors, opiates
  - Schizophrenia, acute psychosis, brain atrophy, CVA's, surgical and emotional stress
- Diabetes – major cause of hyponatremia

Potassium (K+)

- Levels remain constant from young adulthood through middle age after which age related increase occurs (>60 y/o)
- ~30% of long term care geriatric patients may have K+ abnormalities.
- Alkalosis, insulin, and beta-2 agonists, can cause hypokalemia by stimulation of ATP-ase.
- Chronic Metabolic Acidosis
  - Diarrhea and vomiting can cause hypokalemia
    - Diarrhea by direct loss and vomiting (a cause of alkalosis) via renal excretion compensatory mechanism
  - Laxative abuse
- Renal loss is the most common cause of hypokalemia
  - Primary hyperaldosteronism
  - Secondary hyperaldosteronism – stimulation of renin production – renal artery stenosis, diuretic therapy, malignant hypertension, congenital defects of renal salt metabolism

Hyperkalemia

- Hyperkalemia – Usually due to renal impairment – Look for rising BUN and Creatinine
- Other causes include shift from intracellular to extracellular
  - Administration of cationic amino acids (arginine, lysine, epsilon aminocaproic acid,
  - Rhabdomyolysis, hemolysis (renal failure), acute acidosis
  - Digitalis intoxication.
- Reduced renal potassium excretion
  - Aldosterone deficiency – hyporeninemic hypoaldosteronism – most common cause amongst non dialysis patients.
  - Any substance that interferes with renin or angiotensin 2 may cause hyperkalemia – ACE inhibitors, NSAIDS, Beta blockers, Heparin
- Increased intake with impaired renal function.
Diabetes

- Elderly have increased renal threshold for glucose and a decrease in the glomerular filtration rate – therefore although presence of glycosuria is very significant, the absence of glycosuria does not exclude diabetes or glucose intolerance.
- HbA1C – age related slight increase in the elderly – should be considered in test interpretation.
- Blood glucose regulation less efficient in the elderly
  - Decreased physical activity
  - Increased obesity

Blood Cell Count

- Diurnal Variation – highest in the afternoon and lowest in the morning for WBC.
- Average reference values for WBC, neutrophil, and platelet concentration in the black population is lower than in the white population
  - Keep in mind when evaluating for leukopenia
- Hematologic indices (Hgb, Hct, MCV,) lower in blacks than whites And decrease with age in both
  - Keep in mind when evaluating for leukopenia or prescribing drugs that may decrease the Hgb, Hct, WBC – Remember

Erythrocyte Sedimentation Rate

- Increase in ESR with Age
- Women have greater ESR than men at any given age.
- May represent higher disease prevalence in the elderly.
Renal

- Decrease in Glomerular Filtration Rate in elderly
- 50% to 70% of glomeruli non-functioning by age 60 in average adult
- Increasing creatinine with age to approximately 5 to 7% above normal
- Increased BUN and creatinine in Blacks as compared to Whites and Asians.

Kidney with chronic renal failure

Therapies

- Minute adjustments in fluid volumes can potentiate or dilute drug therapies in the elderly, particularly the frail elderly.
- Response systems (Thirst, increased urine volume with increased fluid intake) may not be as efficient as in young and middle aged
AND REMEMBER
GETTING OLD
AIN’T FOR
WIMPS