Cholesterol Rich Disorders

- **LDL Disorders**
  - LDL-C : The **Amount** of cholesterol carried by low-density lipoproteins
  - Apo B or LDL-P: Reflects the **Number** of (atherogenic) lipoproteins carrying cholesterol
- sdLDL-C: The **Amount** of small-dense LDL (**Size**)
- Lp(a): **Genetically** produced lipoprotein that is atherogenic and prothrombotic.
  - ✓ Associated with premature MI and strokes. (Lower LDL-C goal, consider niacin and ASA therapy).
- Cholesterol balance test: **Where** cholesterol comes from
  - ✓ Over producers: **Amount of cholesterol made by the liver** Decrease body fat, statin therapy or red yeast rice
  - ✓ Over absorbers: **Amount of cholesterol absorbed from food by the intestine.** Decrease dietary cholesterol/fat, increase dietary fiber, plant stanols, ezetimibe or bile acid sequestrant
  - ✓ LDL Receptor dysfunction: Poor elimination of cholesterol from circulation (hereditary/genetic or related hypothyroidism or other disorders)
- Statin myalgia test (SLCO1B1): **Which** statin to select to lower cholesterol (to prevent myalgia)
  - ✓ Green or T/T: any statin
  - ✓ Yellow or T/C or Red C/C: choose water soluble statins (pravastain, pitavastatin, rosuvastin or fluvastatin) in lower doses

- **HDL Disorders**

- Low HDL-C: Amount of cholesterol carried by high-density lipoproteins
- Low ApoA1: Amount of apoA-I protein available to build HDL particles. Consider niacin or statin, increase exercise, decrease insulin resistance, simple sugars, saturated/transfat and triglycerides. Smoking cessation if applicable.
- Low very large alpha-1 HDL particles: Amount of apoA-I protein in the most cardioprotective HDL subparticle. Consider niacin or statin, increase exercise, decrease insulin resistance, simple sugars, saturated/transfat and triglycerides. Smoking cessation if applicable.

Metabolic Disorders

- Triglycerides/VLDL-C: Consider omega three fish oil, niacin, fenofibrate, increase exercise and decrease insulin resistance, simple sugars, body weight, and ETOH. Smoking cessation if applicable
- sdLDL: consider niacin, omega three fish oil, increase exercise, decrease insulin resistance, simple sugars, body weight, and triglycerides. Smoking cessation if applicable
- Low HDL-C: Amount of cholesterol carried by high-density lipoproteins
- Low ApoA1: Amount of apoA-I protein available to build HDL particles. Consider niacin or statin, increase exercise, decrease insulin resistance, simple sugars, saturated fat and triglycerides. Smoking cessation if applicable.
- Low very large alpha-1 HDL particles: Amount of apoA-I protein in the most cardioprotective HDL subparticle. Consider niacin or statin, increase exercise, decrease insulin resistance, simple sugars, saturated/transfat and triglycerides. Smoking cessation if applicable.
- High A1c, glucose, insulin and insulin resistance score: consider first line metformin, increase exercise, decrease body weight, simple sugars, ETOH. Smoking cessation if applicable
- Low Adiponectin: A hormone excreted by adipocytes (fat cells) that is anti-atherogenic and insulin – sensitizing. Consider improving insulin sensitivity, lowering body fat if applicable and/or adding niacin or omega three fish oil

Inflammation/Oxidative Stress

- High hsCRP: Associated with systemic or vascular inflammation (treat the cause and/or consider statin, metformin, niacin, fibrates, thiazolidinediones)
- High LpPLA2: Specific to vascular inflammation and doubles the risk for MI/Stroke (treat the cause and/or lower LDL goal, consider statin, niacin, omega three fish oil, ezetimibe, fibrates)
- High MPO: Marker of unstable plaque (treat the cause and/or consider statin, beta-blockers, ACE inhibitors)
- High Homocysteine: Elevations create oxidative stress leading to endothelial dysfunction and increase risk for thrombus (Lower LDL goal, consider methylated folic acid/B vitamins, TMG, decrease excessive caffeine, alcohol, reduce insulin resistance, and smoking cessation)
- High Uric Acid: Elevations create oxidative stress, associated with hypertension and insulin resistance (treat the cause and/or decrease simple sugars and red meats)

Genetic/Risk for Clots

- High Lp(a): Genetically produced lipoprotein that is atherogenic and prothrombotic. Associated with premature MI and strokes (Lower LDL-C goal, consider niacin, ASA therapy)
- Heterzygous or homozygous Prothrombin (Factor II) and Factor V Leiden Genotypes: Associated with increased risk for thrombosis if +/- or +/- consider low dose aspirin therapy especially if on oral estrogen therapy
- Heterozygous or homozygous Clopidogrel (Plavix) Response (CYP2C19) Genotype: DNA test identifies responsiveness to (normal, decreased or increased) clopidogrel therapy
- Boston Heart Statin Induced Myopathy (SLCO1B1) Genotype Test: Which statin(s) least likely to cause statin induced myopathy
- Methylenetetrahydrofolate Reductase (MTHFR): 1-2 genetic variances of MTHFR enzymes responsible for metabolizing folate which can lead homocystiene elevations. Consider methylated folic acid and B vitamins to lower
- High Homocysteine: Elevations create oxidative stress leading to endothelial dysfunction and increase risk for thrombus (smoking cessation, consider adding methylated folic acid/B vitamins, TMG, decrease caffeine, and alcohol)
- Fibrinogen: A protein produced by the liver that is involved in clot formation and is a marker of early inflammation (loss of weight, eliminate smoking, and increase exercise)