Community & Family medicine

Medical nutritional therapy for cardiovascular disease

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**Medical NutritionTherapy MNT**

The use of specific nutrition interventions to treat an illness, injury or condition.

* **Nutrition Care Process**
* Process of planning MNT

1.Assessing nutrition status.

2.Coming up with a nutrition diagnosis.

3.planning intervention(s).

4.Evaluating outcomes.

* **Lipoprotein Assessment**
* Includes measurement of :
* Total cholesterol
* LDL cholesterol
* HDL cholesterol
* Triglyceride level after fasting
* **Lipoproteins found in blood**
  + Chylomicrons = postprandial dietary fat
  + Very-low-density lipoproteins (VLDL) = lipid being transported from liver to peripheral tissue
  + Low-density lipoproteins (LDL) = transport of cholesterol
  + High-density lipoproteins (HDL) = reverse transport of cholesterol, tissues to liver

Type of hyperlipidemia depends upon portion of particles present

LDL and HDL Cholesterol

**Laboratory Values Predict Risk of CHD**

* LDL-C >130 mg/dl
* HDL-C <35 mg/dl
* Total cholesterol (TC) >200 mg/dl
* Total triglycerides (TG) >150 mg/dl
* Formula: LDL-C = TC – HDL-C–(TG/5)

**HDL Cholesterol Levels Predict Risk of Coronary Heart Disease**

Increased by: Exercise

* + - * Weight loss
      * Moderation of alcohol

Decreased by: Obesity

* + - * No exercise
      * Cigarettes
      * Androgenic steroids
      * B blockers
      * High TGs
      * Genetic factors

**LDL Cholesterol Levels Predict Risk of Coronary Heart Disease**

* Increased by
  + Fat in diet
  + Obesity
  + Diabetes
  + Hypothyroidism
* Decreased by
  + Estrogen
* **General Goals for Treatmen**t **of Hyperlipidemias**
* Achieve IBW.
* Decrease simple sugars and alcohol.
* Decrease total fat, especially cholesterol and SFA.
* Increase complex carbohydrate and fiber.

**Lipid-Lowering Drugs Added if Diets Are Not Successful**

After a 6-month trial on each diet, drugs are added to the treatment.

* **Saturated Fatty Acids**
* The most hypercholesterolemic fats are lard, and butter
* SFAs also associated with CAD progression: milk, cheese, butter, lamb, bakery goods, fast foods, snacks(must be limited)
* **Polyunsaturated Fatty Acids**
* When SFA is replaced by PUFA in a low fat diet, both LDL and HDL ↓
* Major source of omega-6 PUFAs are vegetable oils and margarines made with the oil
* **Trans fatty acids(trans fat)**
* Partial hydrogenation of the unsaturated fat converts some of the cis double bonds into trans double bonds by an [isomerization reaction](https://en.wikipedia.org/wiki/Isomerization_reaction" \o "Isomerization reaction) with the [catalyst](https://en.wikipedia.org/wiki/Catalyst" \o "Catalyst) used for the hydrogenation, which yields a trans fat
* High intake of trans fatty acids can lead to many health problems throughout one's life. They are abundant in fast food restaurants. They are consumed in greater quantities by people who lack access to a diet consisting of fewer hydrogenated fats, or who often consume fast food. A diet high in trans fats can contribute to obesity, high blood pressure, and higher risk for heart disease[. Trans fat has also been implicated in the development of Type 2 diabetes
* **Omega-3 Polyunsaturated Fatty Acids: EPA, DHA**
* Found in fish oils, fish oil capsules, and ocean fish .
* Do not affect TC
* Anticoagulant effect
* Decrease vasoconstriction
* Improve endothelial dysfunction
* Reduce inflammation
* One fatty fish meal/week resulted in 50% decrease in risk of cardiac arrest
* **Cis-Monounsaturated Fat**
* Found in olive oil, canola oil, pecans, peanuts, and other nuts.
* Can recommend a higher fat diet if much of the fat comes from mfa
* Mediterranean diet: high in fat, especially MFA (olive oil), fish, nuts, low in red meat associated with ↓ risk of CVD
* **Fiber**
* Soluble fibers in legumes, oats, fruit lower serum cholesterol and LDL-C
* Fiber may bind bile acids, which lowers serum cholesterol .
* Can be achieved with 5 or more servings of fruits or vegetables a day and 6 or more servings of whole grains and high-fiber cereals
* **Coffee**
* Mixed results in studies on effect of coffee on lipids
* Coffee drinkers consume more saturated fat and cholesterol, smoked more cigarettes, and were less likely to exercise
* **Antioxidants**
* Epidemiological studies suggest vitamin E and carotenoids are inversely related to CVD, but randomized trials have not supported this
* **Calcium**
* Supplementation produces small decreases in LDL-C in hypercholesterolemic men
* May form insoluble soaps with fatty acids
* **Soy Protein**
* Daily intake of 25 g of soy will lower LDL-C by 4 to 8% in hypercholesterolemic persons
* **Nuts**
* Peanuts also cardioprotective
* Almonds, hazelnuts, pecans, pistachio nuts, and walnuts modestly reduce serum cholesterol
* Nuts are a rich source of fiber, vitamin E, magnesium, and MUFA and PUFA
* May reduce insulin resistance
* Recommend (1 to 2 large handfuls) in place of other sources of energy
* Choose unsalted, roasted, or raw nuts
* **Summary:**  
  Best CHD Prevention Diet
* Low in saturated fat and cholesterol
* High in monounsaturated fat
* Fish 2+ servings per week
  + Or omega-3 fatty acids supplement
* Fresh fruits and vegetables 7+ servings/day
* Whole grains in place of refined flour and sugar
* Nuts
* Added soy protein, soluble fiber.
* Food and Nutrition Board recommends daily intake of sodium be limited to no more than 2,400 mg (2.4 g).
* Highly palatable Variety of foods and seasonings

**Myocardial Infarction (MI)**

* Some part of coronary circulation blocked
* Ischemia leads to muscle destruction
* Diagnosis: ECG; blood levels of enzymes such as LDH and CPK,Troponins

Postinfarction nutrition

* 1st 24 hrs: no caffeine, liquid diet
* (nausea and choking are common)
* Small frequent meals; soft or liquid diet
* Na+ restriction if BP and fluid status indicate
* Consistent diet information
* Drugs that cause nausea—digitalis, morphine