

## **The Mediterranean Diet** *(Monterey Style)*

The use of the typical American Heart Association-recommended "low-fat, high-carbohydrate diet" did not adequately meet the needs of our lipid clinic. Problems and concerns with this diet included:

1. Using a low-fat, high-carbohydrate diet frequently resulted in a drop in HDL and a rise in triglycerides. This suggested a possible increased production of atherogenic small-dense LDL particles.
2. Studies of low-fat, high-carbohydrate diets in both primary and secondary prevention of coronary artery disease had not shown a reduction in coronary events. Yet, the "Lyon Heart Diet" (a Mediterranean diet) had a clear association between diet and decreased coronary events.
3. The need for a diet for patients who, at baseline, already had a low HDL and/or high triglycerides.
4. There are a number of patients (approximately 25% of the population in some studies) who have a propensity to express the insulin resistance syndrome in the right environment: Namely, a high sugar load.

While trying to maintain a low-fat diet, most patients compensate by shifting to foods labeled "low-fat" which are often very high in processed carbohydrates. This type of carbohydrate has much of its fiber removed, and when ingested, is rapidly broken down into sugar, quickly raising the blood sugar level. Over time, this high sugar load may lead to an expression of the insulin resistance syndrome: low HDL, high triglycerides, and an abundance of small-dense LDL particles.

The solution to these concerns was what has been loosely described as "The Mediterranean Diet." Using the Lyon Heart Diet as a base and with additional recommendations from the literature, our lipid clinic uses the following rationale and recommendations for a "Monterey-Style Mediterranean Diet."

These rationale and recommendations are listed per food group:

### **FATS**

#### **Rationale:**

Individuals depend on fat and carbohydrates for energy sources. If one significantly reduces fat intake, then there is a major shift to carbohydrate intake to supply one's fuel needs, which can lead to an unmanageably increased sugar load in some patients. Therefore, instead of reducing fat, substitute monounsaturated fat for saturated fat. NOTE: Small amounts of polyunsaturated fat can also be substituted for saturated fat.

#### **Monounsaturated Fats:**

As found in olive oil, canola oil, certain nuts, and fish, these do not cause a rise in triglycerides like carbohydrates do. They provide fat for regeneration of HDL without providing building blocks for the production of LDL. They help stabilize the LDL from becoming oxidized. The overall result is a drop in triglycerides and a rise in HDL.

#### **Polyunsaturated Fats:**

These have been separated into three kinds: Omega-3 fats; Natural Omega-6 fats; Trans fats.

1. Omega-3 Fatty Acids: These have beneficial effects. They reduce triglycerides, increase HDL, make LDL more resistant to oxidation, improve endothelial function, retard plaque formation, and reduce the risk of cardiac arrhythmias. Sources of omega-3 fatty acids include:

- A. DHA and EPA found in fish and other seafood. Land animals' fat are largely saturated, while fish fats are usually about 30% monounsaturated and 40% polyunsaturated with increased levels of omega-3 fatty acids. Fish have saturated fat, but nothing like beef, pork, lamb, and poultry.
  - B. Certain plant products have high alpha linolenic acid content, which can be converted to omega-3 fatty acids. These products are often high in monounsaturated fat and include olive oil, canola oil, flaxseed oil, certain nuts, beans, and soybean products.
2. Omega-6 Fatty Acids: These naturally occurring fats are found in vegetable oil. Taken in moderation they are very beneficial, and when used to replace saturated fats, result in a significant drop of LDL levels. Unfortunately, the HDL falls too. If the fall is in proportion to the fall in LDL, then that's okay. Often, however, the HDL falls more. Another concern is that certain metabolic byproducts of omega-6 fats can predispose LDL particles to oxidation. These two negative effects are a real concern when omega-6 fats constitute more than 10% of the diet. Using monounsaturated fats for salad dressing and cooking can reduce the use of these fats. Another way to reduce their intake is to minimize the use of "low saturated fat" commercially produced food items - almost all of these fats are omega-6 fats. The major problem, therefore, with omega-6 fats is that they are often overused.
  3. Trans-Fats: These are polyunsaturated fats, such as vegetable oil, which are liquid at room temperature, but have been hydrogenated into butter-like solids. Trans-fats are very atherogenic. They increase LDL levels, decrease HDL, and make LDL more susceptible to oxidation. These facts are listed on package labels as "hydrogenated or partially hydrogenated vegetable oil," and are found in a number of commercially prepared foods including margarine, fried foods, commercially baked goods (cookies, crackers, cakes, pies, etc.) and high fat snacks (potato chips, corn chips, tortilla chips). These types of fat should be avoided or minimized.

Recommendations:

1. **Minimize saturated fat intake.**
2. **Substitute with monounsaturated fat and omega-3 fatty acids.**
  - Olive oil and balsamic vinegar for salad dressing or bread dip.
  - Use approximately three tablespoons per day of olive oil.
  - Use canola oil for cooking and as a substitute for butter and shortening.
  - Take a small handful of nuts in the late afternoon.
  - Two or more fish servings per week.
3. **Keep polyunsaturated fats (omega-6 fats) under 10% of the diet.**
4. **Avoid trans-fats.**

Remember that monounsaturated fats are still fat, and therefore, add to the diet. These provide 11 calories/gram compared to 4 calories/gram for carbohydrates. Note that the benefit of monounsaturated fats is negated if the patient takes in so many calories worth of them that they gain weight.

**PROTEIN**

Recommendations:

1. **Occasional lean meat.**
2. **Poultry with the skin removed (white meat only since dark meats like duck are high in fat).**
3. **Moderate amounts of low-fat dairy products such as milk, cheese, and yogurt. Limit use of high-fat cheese.**
4. **Fish and shellfish (avoid calamari since it is high in cholesterol).**
5. **Plant proteins like beans and lentils.**

## **CARBOHYDRATES**

### Rationale:

The normal person, when given a sugar load, will rapidly store it in the muscle cell in the form of glycogen. People with a tendency for Insulin Resistance Syndrome and/or LDL pattern B (small dense LDL) when faced with a rapid rise in blood sugar, are slow in transporting the glucose into the muscle cell. As a result, much of the glucose is taken up by the liver and converted to triglycerides. This leads to an increased production of VLDL particles and a lowering of HDL.

The Glycemic Index (G.I.) is a numerical system of measuring how fast a given carbohydrate increases the blood sugar in the 2-3 hours after eating. Initially, the index was based on the blood sugar rise after exposure to 50 grams of glucose. This level was arbitrarily called "100," and other foods were rated against it. For example, if one of these foods raised the test subject's blood glucose level by 70% as much as glucose did, it was assigned an index of 70. More recently, white bread has been used as the index foodstuff, with the sugar level of 50 grams of white bread being assigned 100, and other foods rated against it. So now there are two bases for the Glycemic Index.

The goal of our Mediterranean-type diet is to select carbohydrates which cause a lower, slower rise in blood sugar (i.e., have a low Glycemic Index), so that the insulin resistant patient will have a sugar level he can handle without a lot of glucose spilling over into the liver, resulting in increased triglycerides.

In general, these are carbohydrates which are minimally processed or refined: whole grain breads & pastas, barley, brown rice, and polenta. For an in-depth list of the Glycemic Index, see [www.mendosa.com/gilists.htm](http://www.mendosa.com/gilists.htm).

### Recommendations:

1. **Avoid processed/refined carbohydrates.**
2. **Choose more natural whole foods, such as whole-grain breads & pastas, and brown rice.**
3. **Choose carbohydrates with a low-to-moderate level on the Glycemic Index.**
4. **Read package labels. Ideally, the percentage of calories from sugar should be less than 30% of the total calories from carbohydrates.**
5. **Avoid simple sugars and desserts, such as cakes, pies, candy, cookies, soft drinks, and alcohol. One note with alcohol: minimize intake (less than or equal to two ounces per day) since it has a high sugar content.**
6. **Increase the intake of vegetables, beans, and fruit.**

**Fruits and Vegetables:** Most vegetables and fruits (but no fruit juices) have a reasonable Glycemic Index in the 40-80 range. These also provide a number of antioxidants which help prevent oxidation of LDL. Dark green, leafy vegetables are especially recommended, such as spinach or romaine for salad, because of their high folic acid content which helps minimize the homocysteine level - a known risk factor.

### Candidates for the Mediterranean Diet:

1. Known LDL pattern B (small dense LDL) patients.
2. Suspected or known insulin resistance syndrome patients.
3. Patients with low HDL and/or high triglyceride level at baseline.
4. Patients with a significant drop in HDL or a rise in triglycerides on a low-fat, high-carbohydrate diet.
5. Diabetic patients.

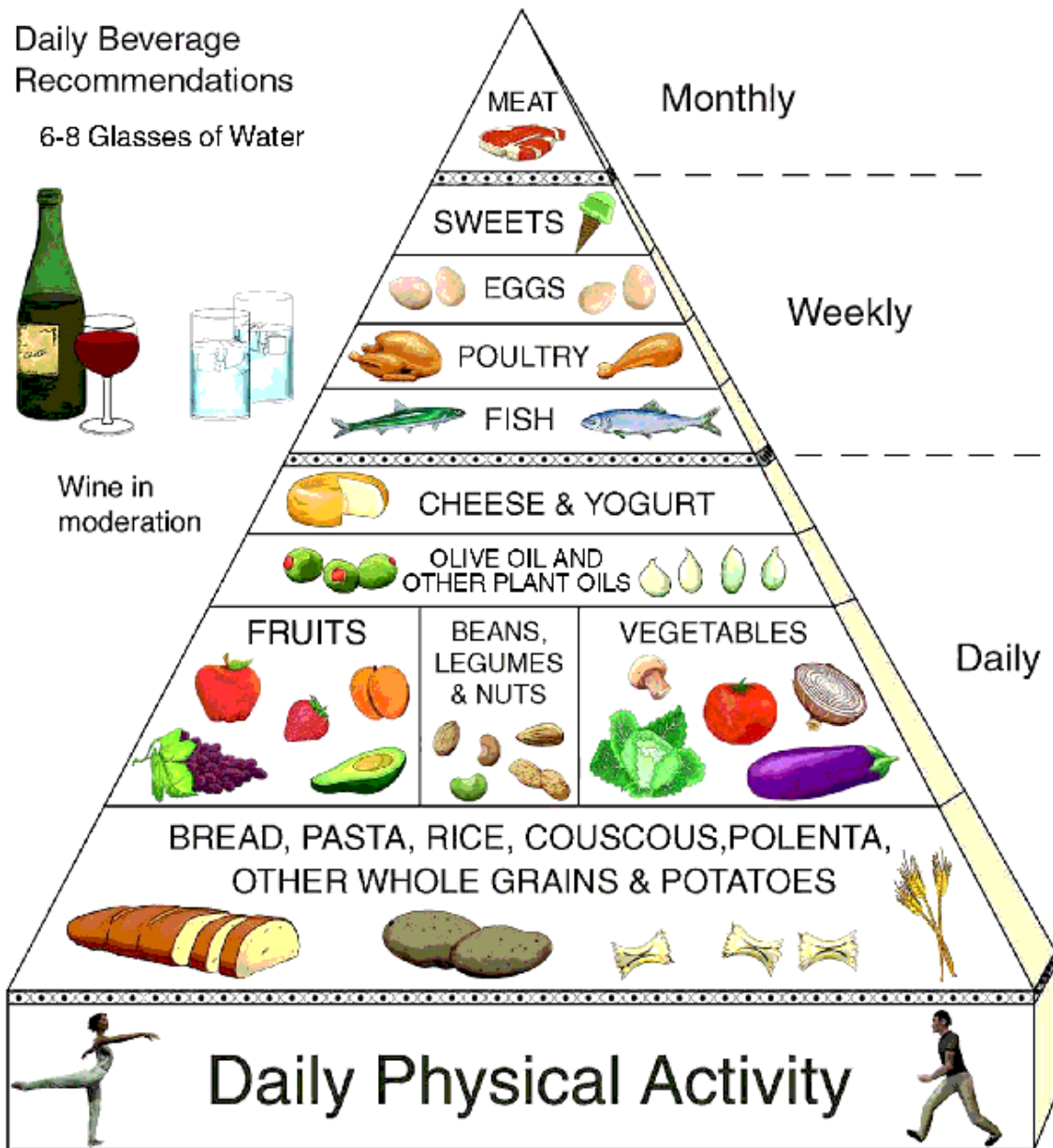
### **TYPICAL PLATE OF FOOD ON THE MEDITERRANEAN DIET INCLUDES:**

Carbohydrates - 25%

Protein - 25%

Vegetables, salad, and fruit - 50%.

# The Traditional Healthy Mediterranean Diet Pyramid



Practical suggestions for patients to incorporate  
the Mediterranean diet into everyday life.

Category	Consume	Avoid
Fruits and vegetables  - flavonoids -	Wide variety of whole fruits and vegetables; try for at least 7-10 servings per day.  Apples, berries	Vegetables prepared in butter or cream sauces.
High-fiber breads, cereals, and pasta	Whole-grain bread and cereal, bran, brown rice	Sweets, white bread, biscuits, breadsticks, and other refined carbohydrates
Protein that is low in saturated fat	Lean cuts of meat (fat trimmed) or poultry (no skin); low-fat dairy foods (skim milk, yogurt)	Bacon, sausage, other processed or high-fat meat, milk or cheese that is not low-fat, ice cream.
Fish or other source of omega-3 fatty acids, at least 1 or 2 times per week	Salmon, trout, herring, water-packed tuna, mackerel (or fish oil supplement); flaxseed, spinach, walnuts	Fried fish (except when pan-fried in olive oil)
Healthy oils for cooking, salad dressing, and other uses	Extra-virgin olive oil, canola oil, flaxseed oil ("high-oleic" sunflower or safflower oil may also be an option)	Omega-6 oils (corn, sunflower, safflower, soybean, peanut)
Peas, beans, legumes, and nuts	Soybeans, lentils, or any kind of peas, beans or legumes; tree nuts (e.g., almonds, pecans, walnuts, Brazil nuts) and avocado 1/4-1/3 cup/day	Heavily salted or honey-roasted nuts; stale or rancid nuts
Alcohol	One 5-oz. glass of wine, a 12-oz. beer, or a 1.5-oz. drink containing distilled spirits with the evening meal.	Limit to no more than one drink daily for women, two drinks daily for men
Fat	Emphasize whole, natural foods as above; look for "trans-fatty acid-free" margarine and snack foods	Fast food, fried food, margarine, chips, crackers, baked goods, doughnuts, any processed food made with partially hydrogenated oil