



Wake Forest University Baptist
MEDICAL CENTER[®]

Urology

DIETARY INFORMATION FOR STONE PREVENTION

Stone formation is due to an interaction of genetic and environmental factors in the majority of cases. Diet is a key environmental factor which can be modified to reduce stone formation. A simple dietary approach which is beneficial for the majority of kidney stone patients is reviewed in this handout.

Urine needs to be supersaturated with the chemicals that compose the stones for them to develop. This means that there is a high concentration of these chemicals present. When this occurs, the respective chemicals crystallize, clump together (aggregate) and a stone eventually develops. This can be due to excessive excretion of these chemicals in urine and/or dehydration. This is a simplified description of this process which is actually quite complex and modulated by a number of other factors.

FLUIDS

Consuming an adequate amount of fluid is a simple and safe method of decreasing urinary super saturation. Tap water is an excellent and readily available fluid for this purpose. However, other fluids may be utilized. Citrus juices and some mineral water preparations contain citric acid which is a chemical that inhibits the crystallization of stone-forming chemicals. The soft drink Fresca has similar properties.

The goal for adult patients is to consume enough fluid for a daily urine output of 2 to 3 liters. Drinking 8 - 10 ounces of water per hour while awake will usually allow this to occur. Another index of adequate hydration is that urine should be almost as light as water.

ANIMAL PROTEIN

The consumption of large amounts of animal protein produces a number of changes in the urinary environment which may promote stone formation including lower pH, increased excretion of calcium, oxalate and uric acid, and reduced excretion of citrate. Therefore, limiting consumption of animal protein, especially red meat, is advisable. **The Atkin's diet should be avoided as it is based on high protein intake which will promote all of the aforementioned urinary changes.** A daily protein intake of 1 gram per kilogram of body weight (1 kilogram = 2.2 pounds) is recommended.

SALT (Sodium)

High salt consumption should be avoided as it promotes a number of deleterious urinary changes for stone patients including an increase in urinary calcium and cystine excretion, and a reduction in citrate excretion. Sodium intake should be limited to 2 grams per day for adults.

DAIRY PRODUCTS

The majority of kidney stones are composed of calcium, and a combination of oxalate or phosphate or both. Dietary calcium restriction was recommended for a number of years. However, there is now ample evidence that this should not be undertaken. Most adults should eat enough dairy products or other calcium containing foods which in total provides 1 to 1.2 grams of calcium per day. An effort should be made to equally distribute calcium intake throughout ones daily meals.

HIGH-OXALATE CONTAINING FOODS

Calcium oxalate stone-formers should avoid eating foods containing high amounts of oxalate. Examples of such foods include spinach, parsley, rhubarb, cranberries, celery, peanuts, soy products, fiber containing cereals, bran and chocolate.

VITAMIN SUPPLEMENTS

Stone patients should avoid consuming excessive amounts of Vitamin C (ascorbate/ascorbic acid). The amount of Vitamin C present in the standard multi-vitamin tablet is not excessive and thus these can be taken. However, other preparations containing greater amounts of this vitamin should not be taken as this may increase urinary oxalate excretion. Calcium supplements such as Tums and Citracal may promote increased calcium excretion when consumed. Thus, one should let their urologist know if they are taking such preparations so that specimen urine testing can be done to determine whether continued utilization is advisable.