



## **Nutrition – Patient Education**

### **Key Nutrients for Bone & Cartilage Health**

**Edward Kelly, MD**

Many patients ask what they can do to help themselves heal better and get back to their activities following an injury or surgery. We would like to provide you with the best information we can to help you get back to your normal activities as soon as you can.

Nutrition plays a key role in getting you back to your activities pain free. Many people have forgotten that we need to eat for nourishment. You cannot overcome a poor diet with supplements. Your diet should be your primary source of your nutrients. The best way to stay as healthy as possible and recover from your injury/surgery is provide your body with key nutrients by eating properly, staying hydrated with plenty of water and not smoking.

Key nutrients for bone and cartilage health are:

Calcium- Calcium is important for bone strength and bone density. Some of the best foods for calcium are dairy- yogurt, milk and cheese, leafy greens, white beans, nuts and seeds. Many more Americans are having difficulty with lactose intolerance. It is best to obtain your calcium from your diet. The Recommended Dietary Allowance (RDA) for calcium for adults is between 1,000mg-1,200mg depending on age and sex.

Vitamin D- Vitamin D is important for calcium absorption. In addition to getting vitamin D from the sun, you can get Vitamin D from supplements as well as egg yolks, salmon and mackerel. Many patients are deficient in Vitamin D so supplements are necessary to get levels up to the optimum level. If you are unsure if you are Vitamin D deficient, your medical doctor can check your Vitamin D levels via a blood test. The RDA of Vitamin D is 600-800 IU for adults.

Vitamin K- Vitamin K is necessary to pull the calcium from the blood for absorption. Vitamin K is found in green leafy vegetables, kale, parsley, romaine lettuce, green leaf lettuce and cauliflower. The RDA for Vitamin K is 90 mcg for women and 120 mcg for adult men.

Magnesium- Magnesium is needed to absorb Vitamin D and Calcium. Foods high in magnesium include green leafy vegetables (found in the chlorophyll), nuts and seeds, mackerel, and whole grains. You can

also obtain magnesium from supplements. The RDA for adult men is 400-420 mg and the RDA for adult women is 310-320mg.

Olive Oil- Olive oil can also be a key player in bone health by helping in calcium uptake.

Antioxidants- Antioxidants are thought to help in joint preservation and decrease anti-inflammatory properties. Vitamin C and E, beta carotene (Vitamin A) and co-enzyme Q-10 are examples of Antioxidants. Foods high in Vitamin C include bell peppers, green leafy vegetables, kiwi, strawberries and citrus fruit. The RDA for adult men is 90mg and adult women is 75mg. If you are going to take supplements, take them in several doses because Vitamin C is a water soluble vitamin and it is excreted in your urine if not absorbed. Therefore, if you are taking high doses at a time, you are likely wasting most of it. You are better off taking two smaller doses twice per day than one large dose. Consider taking up to 3000mg per day during times of high stress and healing. The RDA for Vitamin E is 15mg or 22.4 IU. High Vitamin E foods include tofu, cooked spinach, almonds, avocados and shrimp. Vitamin E is a fat soluble vitamin so it has to be taken with fats in order to be absorbed. If you are taking a Vitamin E supplement, consider taking it with lunch or dinner. Beta carotene is a fat soluble vitamin known for giving foods their orange color. Foods high in beta carotene include sweet potatoes, carrots, dark green leafy vegetables, sweet peppers, peas and broccoli. It is recommended you have between 700-900 mcg of Vitamin A per day.

Omega-3 Fatty Acids- Omega 3 Fatty Acids, especially DHA, are thought to be important in blood clotting, formation of cell membranes and helps decrease inflammation. This can be found in seafood- especially salmon, edamame, wild rice, flax and walnuts.

Other ways to help your body recover is to avoid sources of stress. Stress comes in many forms. There is the emotional form we think of when we are busy with work or have a lot to do around the house but your body also feels stress following surgery or an injury. Your body can feel stressed if you aren't providing it with the nutrients needed for basic functions. Your body can also feel stress by having a poor diet. This includes eating fried, fatty foods; highly processed foods, diet pop, excessive alcohol and smoking.

Smoking is also a way you can impact your healing following an injury or surgery. Smoking significantly inhibits the body's ability to heal. Smoking restricts the blood vessels and decreases blood flow to the injured area. It causes platelets to stick together and therefore they are unable to aid in healing. The carbon monoxide from the cigarette smoke binds to the hemoglobin and decreases the amount of oxygen available in your body and oxygen is needed by your body in order for your body to heal. If you do smoke, please talk to your medical doctor regarding a smoking cessation plan.

Protein deficiency can also inhibit bone healing. Every cell in our body needs protein to function. If you do not have enough protein in your diet, your body will not have enough it needs for the daily functions in addition to healing from your injury. The daily recommended allowance for healthy adults is 0.8g/kg of body weight per day. For adult men, it is estimated to be 56 grams of protein per day and adult women 46 grams of protein per day. Foods high in protein include fish, lean chicken, cheese, lean beef, pork, tofu, yogurt, beans and eggs.

We also want to make sure you have the proper levels of iron in your blood. Iron produces hemoglobin which delivers oxygen to the tissues, which helps them heal. This is why we often check you hemoglobin before and after surgery. Normal hemoglobin levels are 12-16 gm/dL for adult women and 14-18 gm/dL for adult men. To help increase your iron pre or post operatively, meats and iron supplements are an option. Other options include iron enriched breakfast cereals, cooked beans, pumpkin seeds, broccoli, baked potatoes, spinach, green peppers and raisins. It is important to avoid consuming any calcium rich foods or drinking coffee or tea when eating iron rich foods as it limits the absorption. To help increase the absorption, eat iron rich foods along with foods high in Vitamin C, such as orange juice (non-calcium fortified), strawberries and broccoli.

We want you to be able to return to your previous activity level once you are cleared by your physician. Non weight-bearing activities are a good starting point in return to full activity. We recommend beginning with walking, swimming (when your wound is healed as applicable), stationary bike or elliptical to increase your activity level. You can then increase to jogging, tennis or other more strenuous as allowed by your physician. Always get clearance by your physician prior to proceeding with any new activity.