

FOOD RX

Injuries are common and often unavoidable in tennis. Nutrition can help to minimize the impact of sports injury and improve the rate and quality of recovery.

Body structure, improper biomechanics, high rate of loading, as well as the unpredictability of competition make athletes susceptible to injuries throughout their career. Soft tissue injuries involve damage to tendons, ligaments, and muscles, these injuries can be acute or chronic. Bone and joint injuries can result from sudden trauma or repeated stress over time.



Depending upon the severity, some injuries require surgical repair. Each type of injury requires specialized nutrients to expedite the recovery process by aiding the synthesis (production) of new tissues and enhancing the body's natural healing responses.

Key Fundamental Nutrition Strategies For Recovery From Injury



Sufficient calories are required for healing. It is important to consume adequate calories from all macronutrients (protein, fat, and carbohydrate) throughout the healing process. In the acute phase of an injury, there is an initial increase in metabolism and the need to consume adequate calories is vital before surgery or REST. Carbohydrates provide cells with glucose to enhance leukocyte functioning, collagen synthesis, and proteoglycan synthesis.



Adequate fat intake is necessary to promote tissue repair and has the potential to inhibit inflammation. Protein is essential for revascularization, collagen synthesis, and soft tissue regeneration. Lowered caloric intake is needed after the initial phase of recovery secondary to reduced physical activity. Increased protein is required to help repair tissue damage and minimize muscle loss. Maintaining a positive nitrogen balance is required for tissue repair; formation of connective tissues; synthesis of enzymes in wound healing and preserving muscle mass. Food sources include both animal and plant sources of protein.



Maintaining a hydrated state is essential to ensure nutrient delivery to the injured area, help prevent constipation due to pain killers, and replace fluids lost through the wound. Nutrition can also assist when an injured player experiences nausea from pain killers, constipation, or a reduced appetite due to inactivity and stress.

Food sources and practices to assist include:

- Consuming ginger products 30 mins before eating (i.e. ginger beer, ginger tea, and adding ginger to juices)
- Eating bland, non-smelling foods (i.e. bread and honey, crackers, baked sweet potatoes, and potatoes; cereal and rice milk; quinoa, pasta, and juice from vegetables and fruit)
- As tolerated non-smelling protein sources: tofu, yogurt, string cheese, beans, hummus, homemade fruit, and yogurt popsicles, egg whites initially, and then egg

**“LET FOOD BE THY MEDICINE AND MEDICINE BE THY FOOD.”
- HIPPOCRATES (SCHOLAR)**

Specific Nutrition Strategies For Recovery From Injury

Nutrition and its effects on tissue and bone metabolism and healing remain an area of further research. The latest recommendations are provided below.

1. Nutrients Important for the Repair of Bone Injuries

Bone injuries can result from sudden trauma (i.e. fracture) or repeated stress over time (i.e. stress fracture). The nutritional recommendations to optimize recovery include:

- Daily recommended dosage of Calcium is 1500 mg per day (5 servings). Calcium, along with phosphorus, fluoride, and vitamin D, is essential for bone formation. About 99% of the calcium in your body is contained within the bones and teeth. Dairy products are the major source of absorbable calcium. Players who are lactose intolerant can get enough calcium through salmon, nuts, seeds, various vegetables, and calcium-enriched lactose alternative milk. Players who are unable to eat enough calcium in their diet can use calcium supplements which are best taken at bedtime or in-between meals.
- Vitamin D is critical for calcium absorption, blood calcium homeostasis, and bone turnover. Maintaining vitamin D blood levels above 40 ng/mL is recommended for players to help ensure optional recovery from a bone injury. Food sources include wild salmon, dried mushrooms, sardines, egg yolk, ahi tuna, cod, fortified milk, and sunlight.

2. Nutrients Important for the Repair of Joint Injuries

Joint injuries generally result from sudden trauma and include dislocation and/or cartilage tearing.

Glucosamine:

- An amino derivative of glucose that contributes to the growth and repair of connective tissues such as articular cartilage in joints. It is currently used as a nutritional supplement and often in combination with chondroitin.
- Food sources include softshell crab, and small bony fish (sardines, anchovies).



Chondroitin:

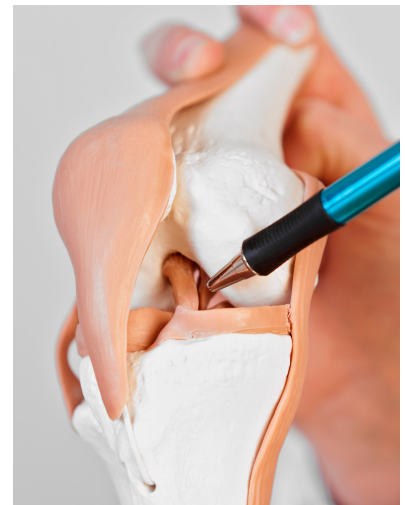
- Is a structural component of cartilage that provides most of its resistance to compression. Along with glucosamine, it has become a widely used dietary supplement for the treatment of degenerative joint disease and joint pain.
- Food sources include connective tissue in meat and gristle on bones.

3. Nutrients Important for the Repair of Tendon and Ligament Injuries

Tendons and ligaments provide structural stability to joints and serve as the connections between muscles, cartilage, and bones.

Nitric Oxide:

- Nitric Oxide: Has several roles in the body but importantly acts as a vasodilator, opening blood vessels and allowing more blood and oxygen to be delivered to muscles. It also mediates collagen synthesis in injured tissue which helps speed the healing process and strengthen damaged tendons/ligaments. Nitrate is found naturally in a range of vegetables which include: beets, spinach, arugula, swiss chard, and celery.



Glutamine:

- Is an amino acid present in plant and animal proteins. It is the fuel source for lymphocytes, macrophages, and fibroblasts; playing a role in collagen formation.
- Sources include: animal products and legumes

Gelatin & Vitamin C:

- Together as shots or gel stimulates collagen synthesis following tissue injury. It is promoted to be used 60 minutes prior to activity. The recommended dose is 10-15 g of gelatin and 50 mg of vitamin C.
- Vitamin C rich foods include citrus fruit, pineapple, bell peppers, kiwi, broccoli, berries, and tomato.

4. Nutrients Important for the Repair of Muscle Injuries

Muscle injuries include contusions, strains, and tears; these can negatively affect the size, strength, and function of muscle, especially if immobilization is necessary for recovery.

Protein:

- Consuming adequate dietary protein to meet metabolic demands can reduce muscle protein breakdown that accompanies an injury and preserve the muscle. 2 g/kg of protein is recommended per day



Creatine:

- Is a naturally occurring compound found in skeletal muscle and the brain.
- Creatine has a role in the regulation of energy production and acts indirectly to help supply the body with ATP. Increased creatine stores can potentially enhance fatigue resistance in high-intensity exercise such as weight training.
- The evidence to support creatine in rebuilding muscle, regaining strength, or attenuating muscle loss during immobilization and the rehabilitation period following is inconsistent. Food sources include wild game, red meat, poultry, and fish.

Fish Oils:

- Contain the omega-3 fatty acids (eicosapentaenoic acid and docosahexaenoic acid) that are known to reduce inflammation in the body. The evidence supporting supplementation of omega-3 fatty acids for enhancing the repair of muscle tissue injury and soreness is inconclusive.
- Food sources include fatty fish (salmon, trout, sardines, white tuna, pollock), flaxseed, walnuts, canola oil, and olive oil.



5. Nutrients Important for Post-Surgical Healing

After injury and in preparation for surgery tennis players should try and reduce the amount of muscle mass size lost prior (see above) and have food bought, prepared, and stored so that post-surgery nutrition goals are easily achieved.

Steps:

1. Rehydration
2. To Provide a caloric intake but cope with nausea and an upset stomach from pain killers and the shock of surgery (see above)
3. Re-introduction of food and meals into the diet. This includes:
 - **Optimize hydration status** – Hydration is essential to healing because it will help to reduce water retention as well as help metabolize and flush out pain medications.
 - **Increase protein intake** – Your body is working hard to repair itself and increasing the amount of high-quality protein in your diet will help facilitate the process. This includes eating protein at all main meals and snacks.
 - **Increase fish oils** – Eat fish regularly, incorporating fish oils adds critical omega-3 fatty acids to your diet which may assist in reducing inflammation and improving joint lubrication.
 - **Increase anti-oxidants** – Dark leafy greens are full of trace minerals that help to promote the healing process. Kale, collard greens, mustard greens, spinach, romaine lettuce, broccoli, and asparagus are all great options. Fruit is rich in antioxidants that help to scavenge free radicals that are produced with injury and stress. Good choices include berries, pomegranate, grapes, oranges, bananas, cantaloupe, and pineapple.

EVERY BITE YOU TAKE IS AN OPPORTUNITY TO NOURISH YOURSELF, MAXIMIZE YOUR RECOVERY, AND OPTIMIZE YOUR PERFORMANCE!

A special thanks to the author, Susie Parker-Simmons, WTA Sports Dietitian.

The information provided within this "Food Rx" topic is for informational purposes only and should not be treated as medical, psychiatric, psychological, health care or health management advice. If you have my health or related questions or concerns, please consult your physician or other qualified health care professional.