

NUTRIENTS FOR BONE/JOINT INJURY RECOVERY



Injury Description

Bone and joint injuries can result from sudden trauma (e.g. fracture, dislocation, cartilage tear) or from repeated stress over time (e.g. stress fracture). These injuries are commonly seen in contact sports, gymnastics, and running/jumping sports that involve repetitive movements. Recovery from bone and joint injuries can be lengthy due to the time needed for bone and cartilage remodeling.

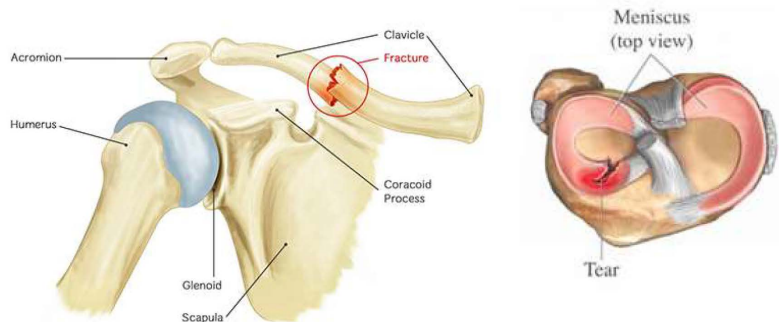
Nutrients Important for Joint Healing

Glucosamine is an amino sugar that plays a key role in growth and repair of connective tissues such as articular cartilage in joints.

Chondroitin is a component of cartilage that aids in cartilage synthesis by providing material for formation of new tissue and absorbing fluids into connective tissue.

Note: Long-term supplementation (> 4-6 months) of glucosamine and chondroitin may improve joint health and reduce pain for athletes with degenerative joint disease. Discontinue use after 6 months if no perceived benefit.

Further research is needed to determine optimal dosage and length of supplementation to support repair of joint injuries. However, food sources may be beneficial for healing as well based on nutrient function.



Left: clavicle fracture

Right: lateral meniscal tear

Nutrients Important for Bone Healing

Calcium is a component of bone matrix, which gives strength and structure to bones. Inadequate calcium intake can negatively impact healing of bone.

- Choose food before supplemental sources
- 1,500-2,000 mg/day has been shown to reduce fractures and support bone healing

Vitamin D is critical for calcium absorption, blood calcium homeostasis, and bone turnover. Maintaining a vitamin D blood level above 40 ng/mL is recommended to prevent stress fractures. Inadequate intake can limit calcium absorption.

- Supplemental doses of vitamin D should be determined by the individual's blood level and monitored by a sport dietitian
- 800 IU/day has been shown to help reduce fractures in female athletes

Vitamin K & Magnesium may inhibit bone healing if intake is below the DRI.

- Supplementation is not warranted above the DRI

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Strategies for Optimal Recovery

1. **Consult with a sports medicine team** to develop a recovery plan that includes strategies to address potential side effects of injury and medication use such as nausea and reduced appetite.
2. **Adjust intake of calories** post-injury to ensure *adequate* for healing and *adjusted* for reduced physical activity/mobility.
3. **Consume adequate protein** to help repair tissue and minimize muscle loss.
4. **Focus on hydration** to facilitate blood flow and nutrient delivery to injured areas.
5. **Eat calcium-rich foods** at each meal and snack to ensure adequate intake for healing.

Meals & Snacks to Aid Recovery

- *Yogurt with granola, nuts, and fruit*
- *Calcium-fortified OJ with oatmeal and eggs*
- *Fortified cereal with milk and eggs*
- *Tofu, bell pepper, and cabbage stir fry with brown rice*
- *Beef stew (includes cartilage) with potatoes, carrots, and tomatoes*
- *Grilled salmon with mushrooms and broccoli*
- *Sardines (canned with tomato sauce or mustard) on toast or crackers*
- *String cheese and sliced kiwi*
- *Cottage cheese with salsa and chips*

Food Sources of Key Nutrients

Nutrient	Sources	Important for bone healing	Important for joint healing	Important for wound healing*
Calcium	milk/milk alternatives, cheese, yogurt, tofu, sardines, collard greens, calcium-fortified juices	X		
Vitamin D	wild salmon, dried mushrooms, sardines, fortified milk and juice, sunlight	X		
Vitamin K	leafy greens, broccoli, soy foods, prunes, pumpkin	X		X
Magnesium	pumpkin seeds, almonds, spinach, soy foods, avocado, cashews, legumes	X		
Glucosamine	soft-shell crab, small bony fish (sardines, anchovies)		X	
Chondroitin	connective tissue in meat, gristle on bones		X	
Arginine	shrimp, white meat turkey, frozen spinach			X
Glutamine	beef, chicken, fish, beans, dairy, cabbage, beets, legumes			X
Zinc	oysters, beef, fortified cereals, pork, beans, dark meat chicken, yogurt, cashews, chickpeas			X
Vitamin A	sweet potato, carrot, mango, red pepper, cantaloupe, egg yolk, dairy, green vegetables, fish			X
Vitamin C	citrus fruit, pineapple, bell peppers, kiwi, broccoli, berries, baked potato, tomato, leafy greens			X

*Utilize these nutrients if healing from a wound due to a bone or joint injury or surgical intervention

Athlete Recommendations: