NUTRITION DURING INJURY

Depending on the severity of an athlete’s injury they may have to miss practices, competition or even undergo surgery. Within the first few days of sustaining a serious injury, an athlete’s activity level will drop dramatically. Studies show that healthy, inactive muscle tissue can atrophy at approximately 0.5% per day, with the first 1–2 weeks showing the greatest relative loss of muscle mass. As such, physical performance will decline quickly, which highlights the need for preventative measures in order to minimize tissue loss and support repair.

In this situation, athletes tend to reduce their caloric intake to avoid unwanted weight gain. While a reduction in caloric intake may be appropriate, particularly when immobilized, it is detrimental to deprive the body of the nutrients needed to support the 3 stages of healing: inflammation, proliferation and maturation. The following is practical information on specific strategies and foods to promote healing, minimize loss of muscle mass, and support a faster return to full training.

Energy Balance
The body needs to be in energy balance to support healing. It is best not to leave gaps longer than 3-4 hours between meals. Aim for 3 meals (breakfast, lunch and dinner) and choose appropriate snacks. Reduce portion sizes and opt for lower calorie, protein rich snacks if weight gain is a concern.

Food Quality
To support the healing process, include a variety of the following, nutrient rich foods:

- **Fibre rich grains** such as quinoa, brown rice, barley, multigrain or black bean pasta, sprouted or whole grain breads, old fashioned oatmeal, multi or whole grain cereals and legumes.
- **Antioxidant rich vegetables and fruits**, especially red, purple and green varieties.
- **High quality fats** from natural sources, such as extra virgin olive oil, olives, avocados, cold pressed coconut oil, organic or grass fed butter, fish, nuts such as walnuts, almonds, and macadamia, as well as seeds such as flax and chia.

*Note:* For some individuals who are facing a long recovery period, or those who gain body fat easily, consumption of healthy fats may need to be reduced to avoid high excess caloric intakes.

Protein Intake
Insufficient protein intake will impede wound healing, which is reliant on the synthesis of collagen and other proteins. For this reason, it’s important to meet protein requirements as this will speed up recovery time. To support muscle mass maintenance during recovery during disuse, athletes require between 1.2 – 2.0g of protein per kg body mass. Distribute protein intake evenly throughout the day for optimal protein absorption and appetite suppression. Adding a casein-rich (slowly absorbed protein) pre-sleep snack can stimulate muscle protein synthesis through the night. Please refer to the Protein fact sheet to learn more about calculating your protein needs and for examples of high protein foods.
### Specific Nutrients That Support Healing

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Description</th>
<th>Food Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glutamine</td>
<td>Glutamine levels may decrease naturally during wound healing. Combined with glutamine’s role in arginine production, foods rich in glutamine may support wound healing.</td>
<td>Beef, chicken, fish, eggs, dairy, wheat, cabbage, beets, beans, spinach, parsley.</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Vitamin C is an essential cofactor for the synthesis of collagen, proteoglycans and other components of bones, skin, and other connective tissues. Deficiency can negatively impact regenerated tissue strength.</td>
<td>Green peppers, citrus fruits, strawberries, tomatoes, broccoli, turnip, leafy greens, sweet potato, melon, raspberries, blueberries, cranberries, pineapples.</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>Vitamin A is essential to the healing of the thin tissue that lines organs. It also helps in determining the rate of collagen formation between cells.</td>
<td>Liver, milk, cheese, butternut squash, carrot juice, spinach, sweet potato, dried apricots.</td>
</tr>
<tr>
<td>Zinc</td>
<td>Zinc is an essential trace mineral for DNA synthesis, cell division, and protein synthesis – all of which are necessary for tissue regeneration and repair. Zinc demands are thought to be highest from time of wounding throughout the early inflammatory phase. Deficiency is associated with poor wound healing.</td>
<td>Oysters, red meat, poultry, seafood (crab, lobster), fortified breakfast cereal, legumes, nuts, whole grains.</td>
</tr>
<tr>
<td>Arginine</td>
<td>Arginine concentrations are depleted in two major catabolic pathways during the healing process. Thus, arginine is essential for wound healing.</td>
<td>Meat, seeds, spinach, lentils, soy, whey protein.</td>
</tr>
<tr>
<td>Omega-3 Fatty Acids</td>
<td>Research indicates that supplementation with 3g of fish oil derived omega 3 fatty acids may help maintain lean tissue (SITE) by regulating protein synthesis. Prior to undertaking Omega 3 supplementation seek advice from your sport dietitian.</td>
<td>Oily fish (salmon, kippers, mackerel, sardines), omega-3 enriched eggs. ALA sources: walnuts, brazil nuts, pine nuts, almonds, chia seeds, oils (sunflower, flax, pumpkin)</td>
</tr>
<tr>
<td>Creatine</td>
<td>An amino acid involved in rapidly supplying energy to exercising muscles. Is also involved in skeletal muscle creation. May help decrease the loss of muscle during injury. Prior to undertaking creatine supplementation seek advice from your sport dietitian.</td>
<td>Meat, fish</td>
</tr>
<tr>
<td>Leucine</td>
<td>Leucine is a branched-chain amino acid that is essential to stimulate muscle protein synthesis. Supplementary leucine (3 – 3.5g/ 3 x day) may assist in retaining lean tissue. Prior to undertaking leucine supplementation seek advice from your sport dietitian.</td>
<td>Beef, fish, poultry, eggs, legumes, dairy, nuts.</td>
</tr>
<tr>
<td>Gelatin</td>
<td>Gelatin is a protein formed when the skin, bones and connective tissue of animals is boiled in water. Supplemental use of gelatin may increase collagen cross linkages in ligaments and tendons which may improve stiffness.10</td>
<td>Therapeutic sources are found only in supplements.</td>
</tr>
</tbody>
</table>

**Any supplement taken by an athlete should be discussed with your Sport Dietitian to provide minimal risk**
What to Avoid

Alcohol has been shown to have a detrimental effect on cell signalling and protein synthesis in rodent skeletal muscle. A recent publication examining the effect of alcohol on exercise recovery in human skeletal muscle also showed impairment in Muscle Protein Synthesis despite optimal nutrient provision. As with all nutrition programs it is important to avoid consumption of hydrogenated fats and heavily processed foods as well as limiting sugar intake. This is particularly important when trying to avoid unwanted weight gain.

Future injury or potential surgery can never be predicted. For this reason, it is important that high quality nutrition is practiced to prevent any initial injury and injury reoccurrence. Quality nutrients are essential to repair and recover, and will lead to faster healing and overall improvements in performance. Following the above guidelines should help with decreasing negative body composition changes, assist with maximizing the rate of healing and expedite return to training and competition.

**Please speak with your Sports Dietitian for further information**


