Nutrition and Wound Care

Following a Wound Healing Diet
There are a lot of factors that go into the success of a wound treatment plan, including the types of wound care products used, stress levels, patient compliance, overall health of the patient, and any medications the patient might be taking. The foods you choose to put into your body also have a huge effect on how fast and well your wound heals, but it has only been within the past quarter century that the medical community has truly begun to understand the link between wound care and nutrition. Even today, many clinicians do not incorporate good eating habits into treatment plans, so it’s important to fully understand how your diet can enhance healing so you can spark a substantial conversation with your provider.

**Nutrition and Wound Healing**

The concept behind the link between food and wound care is quite simple - when your body has the right nutrients, ample fluids and enough calories, it is better suited to move through the wound healing stages swiftly and keenly. Too often, people actually neglect their dietary needs due to their wounds. When an ulcer causes immobility, for example, some believe that the inactivity makes nutrients less necessary and may even cut calories to keep off weight. But your caloric needs are actually heightened during this time, as you require energy to fuel the healing process. When you don’t get enough nutrients, the ligaments and muscles can break down, further delaying healing. As the Hospital for Special Surgery recommends, you should aim to eat about 15 to 20 calories per pound each day.

**What Should You Be Eating?**

Protein and iron, which can be found in meats, poultry, eggs, fish and nuts, are essential for expedient tissue repair, as is calcium - dairy products and leafy greens are generally high in this nutrient.

Vitamins A, C, and K are particularly healthy in skin repair, and be sure to get plenty of vitamin E - its anti-oxidizing properties can help boost the immune system and stave off infection. These can all be obtained through a balance of lean meats, fruits, vegetables, dairy, and whole grains. Those who are unable to get enough nutrients even after making changes in diet may consider taking supplements. However, you should discuss this option with your health care provider before moving forward.

It’s also important to make sure you’re getting enough fluids - at least 8 cups of water or other non-diuretic beverages every day. Wounds tend to heal best in moist environments, which is not possible if you starve your body of fluids. Additionally, some medications can dehydrate you and may require you to drink more.

**What Research Tells Us**

A report looking into the relationship between nutrition and wound healing was published in the February 2010 issue of *Nutrition in Clinical Practice*. Researchers noted that not only does a good balance of vitamins and nutrients enhance treatment, but a lack of them can be detrimental to the healing process. In fact, malnutrition has been shown to reduce tensile strength, making the wound more susceptible to breakage and reopening under stress. It has also been linked to increased infection rates and can result in chronic non-healing wounds. Such chronic wounds are a notable cause of death.
among patients and can pose a serious threat, making proper eating habits imperative not only to speedy healing but also the health and wellness of the patient.

Although everyone heals at a slightly different rate, individuals with some nutritional deficiency are often at a disadvantage for healing. However, recent studies have shown that some nutritional deficiencies have a higher correlation with wound healing than others, and may be more important to supplement in patients.

**Nutrition During Each Phase of Wound Healing**

Other studies have focused on what nutrients are most beneficial during different phases of the wound healing. An Austrian study published in the journal *Nutrition* also found that protein is key to wound healing in all stages, yet also looked at how different minerals and nutrients can be particularly beneficial during different stages of the wound healing process.

For example, researchers found that fatty acids can be helpful in the initial stages of wound healing, when the affected area is slightly inflamed and more blood flow is going to the region. Therefore, a diet that is higher in omega-3 fatty acids right after the wound has occurred may help prompt a faster healing process.

Similarly, vitamin C was found to assist with healing a wound during the final stages of healing, when new collagen is forming and aligning itself with the surrounding tissues. During this final stage, upping your intake of citrus juices, cruciferous vegetables, and fruits like cantaloupe and strawberries may help prompt healing.
In order for your body to heal properly and stave off wound infection, it must maintain healthy levels of vitamins and nutrients. Protein, antioxidants and zinc are among the elements you need in heightened amounts during recovery, and you may also want to increase your intake of the three most basic vitamins: A, B and C. These three vitamins each play their own role in helping you quickly heal from a wound.

According to the University of Maryland Medical Center, vitamin A aids cells in the reproduction process, known as cellular differentiation. This is an integral part of wound healing, as cellular reproduction must occur for new tissue to grow. Vitamin A also helps reduce the risk of wound infection, as it is essential to proper immune system function, and the nutrient helps manage inflammation that occurs after a wound is sustained.

While a serious deficiency in this nutrient is rare, many people have moderately low levels of vitamin A, particularly among low-income populations. The biggest sign of a deficiency is trouble seeing at night - vitamin A is important to sight. Fortunately, this issue can generally be resolved by incorporating more foods high in vitamin A, such as:

- Kale, spinach and other leafy greens
- Carrots
- Sweet potatoes
- Squash

It’s especially important for pregnant women and children with healing wounds to get enough vitamin A, as these groups are more susceptible to deficiency, according to the UMM Medical Center. Those who are having trouble increasing their vitamin A levels should speak with a clinician before taking supplements for this nutrient, as it can be dangerous in high doses and even lead to liver failure when too much is consumed.
Vitamin B consists of several different types, including B1 (thiamine), B2 (riboflavin), B3 (niacin) and so forth. The main purpose of this vitamin complex is to metabolize carbohydrates and proteins to produce energy, which is essential for cell growth and movement. Vitamin B can be found in a range of foods, most commonly poultry, eggs, dairy and fish.

Vitamin C is important to the synthesis of collagen and the growth of new blood vessels to replace damaged tissue. This element also has a strong antioxidantizing effect that enhances the immune system and, in effect, protects against wound infection. Another perk is that vitamin C helps the body better absorb iron, which works to supply the wound bed with oxygen and energy for more efficient cellular development. Vitamin C can be found in citrus fruits, bell peppers, papaya, mango, pineapple, broccoli, cauliflower, and strawberries.
According to the series “Nutrition Minute” published in the journal *Advances in Skin & Wound Care*, sustaining an injury causes the cells in your skin to require higher amounts of vitamin D. That’s because of the many vital roles the element plays in the recovery process. It controls genes that promote the creation of cathelicidin, an antimicrobial peptide that the immune system uses to fight off wound infections. If you have a vitamin D deficiency, your immune function can become compromised, making you more susceptible to potentially harmful bacteria and other foreign invaders.

While other vitamins and nutrients are generally introduced to the body through the foods we eat, vitamin D works a bit differently. The main source of this element is exposure to sunlight. Ultraviolet-B radiation waves stimulate the production of vitamin D from a chemical in the skin’s epidermis called 7-dehydrocholesterol, which then promotes proper wound healing. As such, it acts more like a hormone than a vitamin.

Many elements come into play concerning skin synthesis of vitamin D. The latitude and air quality of where you live as well as your sunscreen habits may help determine how much of this nutrient is produced in the epidermis. For this reason, deficiency is not uncommon. But there are other ways to increase your levels of this nutrient without spending an excessive number of hours in the sun, which can be dangerous to your health. According to the National Institutes of Health, these foods are high in vitamin D:

- Cod liver oil
- Swordfish, salmon, tuna and other fatty fish
- Many fortified drinks, such as milk and orange juice.
- Beef liver
- Egg yolk
- Mushrooms
- Swiss cheese
Fats provide your body with energy, which is crucial to everyday life. As the National Institutes of Health explains, the body pulls calories from carbohydrates through the foods people eat; however, once those calories have been expended, it begins to pull calories from fat. Without it, the body will begin to pull energy from other sources, such as the bones and tissue. Fats also play a plethora of other roles in helping maintain general wellness. For example, these nutrients keep the skin and hair healthy, and they fill cells in the body, thereby insulating the body and helping keep it warm.

By helping the body stay healthy and active, fats promote healing. However, these nutrients also have more direct effects on the ability to develop new tissue and progress through the wound healing stages. Fatty acids are necessary for the creation of cell membranes, and your body may require extra amounts in order to heal properly during recovery.

The fats obtained from food are known as “essential,” as the body cannot produce them on their own and relies on outside sources. They provide the body with the necessary fatty acids - linoleic and linolenic acids, which are important for controlling inflammatory responses and blood clotting, as well as brain function. However, all fats contain two types of fatty acids: saturated and unsaturated. As the NIH recommends, saturated fats should comprise no more than 10% of your daily caloric intake. Foods with high levels of saturated fats generally come from animals, such as whole milk, cheese, butter and fatty cuts of meat.

Products high in saturated fat can lead to high levels of LDL cholesterol, which can cause build-up in the arteries and, in turn, an array of cardiovascular complications. Stick to unsaturated fats as opposed to saturated fats to maintain healthy cholesterol levels while still providing your body with energy and nutrients essential for wound healing and general wellness. When selecting foods that contain oils, choose ones that say “monounsaturated” or “polyunsaturated,” both of which contain good fats. Such oils include olive, sunflower, canola, peanut, corn, soybean and safflower oils.

These foods are also excellent sources of healthy fats:

- Avocado
- Olives
- Peanut butter
- Nuts and seeds
- Flaxseed
- Soy and soy milk
- Tofu
- Fatty fish, such as salmon, tuna and trout
The mineral zinc is essential for overall health and various aspects of cellular metabolism, according to the National Institutes of Health. In terms of wound healing, it benefits the body by helping to maintain the structural integrity of dermal tissue and mucosal membranes. That’s why many clinicians turn to zinc supplements for people suffering from skin ulcers. Another benefit is that zinc aids in the division of cells, which is the function responsible for creating new tissue. Additionally, it plays a big role in immune function. A stronger immune system is important for fighting off potentially harmful elements and, in effect, avoiding the development of wound infections.

Zinc can be found in a wide variety of foods, but it comes in particularly high concentrations in red meats, seeds, and nuts. Those increasing their intake of red meats should stick to lean varieties, which include bottom and to round as well as eye of round cuts. Some grades of ground beef are also low in fat. You may also want to speak to your health care provider before increasing meat consumption to ensure that it is suitable for your heart health. Other great sources of zinc include:

- Shrimp
- Cashews
- Lentils
- Sesame and pumpkin seeds
- Lamb
- Turkey
- Quinoa
Protein

Protein is essential for wound healing. The element is made up of amino acids that are necessary for a wide range of bodily functions, from serving as a messenger for hormonal chemicals to providing antibodies for the immune system. Every single cell consists of proteins, and tissue requires it to be able to repair and regenerate after a wound is inflicted. For most Americans, meat, fish and poultry are the main sources of protein. However, for those who have chosen to live a vegan or vegetarian lifestyle, it can be difficult to get enough of the nutrient. If this is your dilemma, try these vegan-friendly sources of protein to enhance the wound healing process:

- Quinoa is a grain often used as a substitute for rice, though it can also be grounded up and used to make cookies, muffins and other baked goods.
- Soy is a go-to food for vegetarians that often comes in the form of tofu (the harder the tofu is, the more protein it has).
- Peanut butter is a childhood favorite that provides healthy fats and essential amino acids as well as protein.
- Buckwheat, despite its name, is not a form of wheat but a close relative of rhubarb. It can be ground into flour, and many people eat it as oatmeal.
There’s a stigma surrounding the use of vitamin supplements to provide the body with important nutrients: many people believe they don’t work as well as the natural method and, as the American Heart Association points out, some experts even say that they’re a hoax. But in the past decade, studies have suggested that vitamin supplementation actually may speed up wound healing.

A review published in *Current Opinion in Clinical Nutrition and Metabolic Care* looked into vitamin supplements in people who suffer from wound healing disorders. The researchers evaluated a selection of intervention studies and found that many revealed positive results for supplements. These studies showed that oral supplements rich in zinc, vitamin C, and arginine helped prevent pressure ulcers from developing. Additionally, evidence suggested that vitamin C combined with pantothenic acid may be useful in accelerating the healing process.

This analysis backs up previous research in the field that supports the use of supplements for faster wound healing. In 2004, scientists from the University of Texas Southwestern Medical Center Advanced Wound Healing and Tissue Regeneration Laboratory explored the topic and published their findings in *Plastic and Reconstructive Surgery*.

They conducted a clinical trial involving two groups of 13 healthy subjects who had open wounds after biopsies. One group took an oral supplement containing vitamin C, bromelain, rutin, and grape seed extract for six weeks, while the other took a placebo. The results showed that those who took the supplements healed 20% (about three days) faster than those who did not, supporting the notion that oral vitamins may help you more effectively cover from wounds.

Be sure to consult a clinician before taking any supplements or making any significant changes to your diet. If you have any questions about your overall health, always ask your physician for guidance.