

Optimal Collagen

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Most of us are familiar with collagen as a dietary supplement, but as with many things in life, the devil is in the details. Variables can make the difference between success and failure. I'm talking about the therapeutic dose, the time it takes to see a difference, the cofactors, the actual ingredients, and of course, patient compliance.

Let's take a minute to review some of the latest information on collagen and then dive into the details. 30% of total body protein is collagen. It's the main structure of connective tissue. Currently, 29 types of collagen have been identified. However, 80%-90% of the total collagen found in the human body are lumped into 3 main types. Type I make up bone, skin, tendon, ligaments, and cornea. Type II are essential to make cartilage. Type III is needed for large blood vessels, uterus, bowels, etc. And although we think of collagen as purely structural, there are benefits that we rarely consider. For example, some of the benefits of collagen are: direct effects on fibroblasts, M2-like



macrophage activation, oral tolerance-related mechanisms, antimicrobial, antihypertensive effects, promotion of wound healing and bone synthesis, regulation of inflammation by inhibiting cytokines like TNF-alpha, antioxidant properties, regulation of cell growth and differentiation.

So, collagen supports healthy aging, strenuous physical activity, especially if it involves joint impact, hormonal changes, trauma recovery, burns, aggressive cancer therapy, healthy skin, as well as dental implants. As long as we are mentioning skin, several studies show collagen improves skin hydration,

wrinkles, and elasticity. Patients may not want to invest in many aspects of their health, but when it comes to hair, skin, and nails compliance goes up dramatically.

Two studies, one from 2021 with 1,125 subjects and another from 2022 with 1,721 subjects stated that, “ingestion of hydrolyzed collagen for 90 days is effective in reducing skin aging, as it reduces wrinkles and improves skin elasticity and hydration.”

Another area that collagen shows promise is chronic pain. As you might expect, these studies suggest higher doses in the 10 to 20 g/d range

over a 6 to 9 month period. An application that I would normally not consider is cardiovascular health, even though we need collagen for the insides of blood vessels. A meta-analysis of randomized, placebo-controlled trials by the *British Journal of Nutrition* correlating effects of collagen peptides on cardiovascular markers showed great promise. "Our analysis also indicated that collagen peptide supplementation did not affect glycemic markers. Our outcomes indicate that collagen peptide supplementation reduces fat mass, LDL, and systolic blood pressure, while increasing fat-free mass."

Since collagen has been the leading protein product for Biotics Research, they have added an additional collagen product to supply a full range of peptides called Optimal Collagen. Optimal Collagen supplies Types I, II, III, V, and X forms of collagen from hydrolyzed bovine, chicken, and eggs. It boasts 20 grams of collagen peptides with 18 grams of protein. But what really sets it apart for me, from any other collagen on the market, is the 10 mg of silicon in the most bioavailable form. What will endear this product to your patients, however, is the fact that it dissolves in water and is virtually tasteless.

Why 10 mg of bioavailable silicon? Let's turn our attention to the structure of collagen for a moment. Because what gives collagen its strength is the cross-linked properties, and to make those cross links possible, we need silicon. After oxygen, silicon is the second most abundant mineral on earth, and it's the third most abundant trace element in the human body. Silicon is the collagen glue that contributes to collagens' architecture, strength, durability, and elasticity of connective tissue. Silicon creates a bond with collagen, elastin, keratin, and proteoglycans. It stimulates fibroblasts to secrete Type I collagen (OSA).

Silicon from our food is poorly bioavailable and refined food contains less silicon. Sadly, as we age, and we need silicon the most for structure and connective tissue support, it decreases. Silicon deprivation leads to fragile bones and

cartilage. On a side note, silicon displaces aluminum in our brains. You may remember a program we shared highlighting Christopher Exley and how he found extremely high levels of aluminum in Alzheimer brains as well as children with autism. You can see a link for that discussion. In all his research, he found silicon to be the best mineral to keep aluminum from accumulating in the brain. However, there is great variation in silicon bioavailability, ranging from less than 1% up to values close to 50%, depending on the chemical form.

Some questions have arisen as to which products are more effective, collagen from food or supplements? Based on our discussion, food-based collagen should be encouraged, but since dietary collagen is not a familiar part of the diet, supplements can supply a more consistent dose and have a few advantages. First, supplements are predigested, which means a lower molecular weight. This provides raw materials for the intestinal gut lining and the microbiota. Also, lower molecular weight means increased absorption, distribution and use throughout the body. More and more methods of delivery have become available over the last few years. Injectable collagen, creams, etc. I would encourage you to think of the processing and adjunctive carriers necessary to make injectables and creams. When it comes to injectables, there is a definite increase in cost, discomfort, and bruising. When it comes to creams, there is limited skin penetration. Oral supplementation, on the other hand, is safe, cost-effective, and easy to incorporate into daily routines. Newer research studies show some forms of collagen are highly bioavailable. When choosing a collagen product, make sure it has at least the Types, I, II, and III collagen. Next, make sure it has a source of silicon that is bioavailable. Also, make sure it contains at least 20 grams of collagen peptides. Finally, make sure you communicate to your patients that it will take time to see tissue changes.

Thanks for taking time to be with me today. I look forward to being with you again next Tuesday.