



Collagen supplements

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Collagen is an insoluble and fibrous protein that is a key structural component of skin, bone and connective tissue. There are 29 types of collagen, 80–90% belonging to types 1, 2 and 3. Natural collagen is mainly sourced from animal products such as fish scales, pork and chicken skin, bone broth and egg whites. Gelatin and collagen have been used for centuries as a food source and traditional medicine for bone and joint health, wound healing and a variety of other medical ailments.

PREPARATIONS: Collagen supplements are available as powder, capsules, tablets, gummies, liquids and as ingredient in a variety of cosmetic products. Originating from various animal sources, collagen supplements are available as proteins, peptides, gelatin, or hydrolysate. When denatured by heat, collagen is converted into gelatin. Further hydrolysis results in collagen hydrolysates (CH), which are water soluble, non-gelling peptides. Most collagen supplements are CHs which are easily dissolved in hot or cold liquids and can be added to food. Vegan collagen has been synthesised from genetically modified yeast and bacteria.

ACTIVE CONSTITUENTS: Collagen type I, II, III, IV (less commonly) and V can be found in supplement form.

MEDICAL CLAIMS: Collagen supplements claim to improve skin health by increasing elasticity and hydration, stimulate the growth of hair and nails, reduce joint pain and improve mobility in rheumatoid and osteoarthritis, prevent bone loss, aid wound healing, boost muscle mass and support blood clotting.

EVIDENCE: Preliminary results for oral collagen supplements in skin aging appear promising. CHs have been shown to increase skin hydration, elasticity and dermal collagen density, improving skin texture and mechanical properties of skin. Hydration was found to be more significant in people aged > 50 years, and improvement in elasticity was observed with a longer duration of therapy (60 days) compared with younger participants. Topical application of collagen is unlikely to demonstrate anti-aging effects due to poor skin penetration.

Collagen supplements may reduce pain and improve joint function in osteoarthritis (OA),

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Summary message

There is promising scientific evidence to support oral collagen supplementation in improving skin elasticity and hydration. For arthritic joint pain, the research evidence is mixed. Some studies suggest that collagen supplementation may reduce pain and improve joint flexibility in osteoarthritis, however the type of collagen, dosage and duration required, and safety concerns regarding the use of animal products, require more quality research and quality control. Although collagen is considered relatively safe with few adverse effects - which include diarrhoea, abdominal heaviness/discomfort and headache - people with any allergies or sensitivities to animal sources, or have sulphite allergies, should not take collagen with these ingredients. Due to limited evidence, use should be discouraged in pregnancy and lactation.

Herbal medicines are a popular health care choice, but few have been tested to contemporary standards. **POTION OR POISON?** summarises the evidence for the potential benefits and possible harms of well-known herbal medicines.

however trials show mixed results. Following 6 months of treatment, most published literature detects some clinical benefit of CH over placebo with an improvement in joint flexibility, reduction of pain and improved quality of life. However better designed clinical trials are required to define the optimal duration and dosage requirements for collagen supplementation in patients with OA.

ADVERSE EFFECTS: Diarrhoea, dyspepsia, a bad taste in the mouth, headache, dizziness, insomnia and rash have been reported. People with any allergies or sensitivities to certain animal sources (eg fish) or who may have sulphite allergies should not take collagen with these ingredients. Rarely, liver abnormalities have been reported.

DRUG INTERACTIONS: There are no documented interactions of collagen with drug therapies.

Key references

1. Proksch E, Segger D, Degwer J, et al. Oral supplementation of specific collagen peptides has beneficial effects on human skin physiology: a double-blind, placebo-controlled study. *Skin Pharmacol Physiol*. 2014;27:47–55. doi:10.1159/000351376
2. Kumar S, Sugihara F, Suzuki K, et al. A double-blind, placebo-controlled, randomised, clinical study on the effectiveness of collagen peptide on osteoarthritis. *J Sci Food Agric*. 2015;95:702–7. doi:10.1002/jsfa.6752
3. Czajka A, Kania EM, Genovese L, et al. Daily oral supplementation with collagen peptides combined with vitamins and other bioactive compounds improves skin elasticity and has a beneficial effect on joint and general wellbeing. *Nutr Res*. 2018;57:97–108. doi:10.1016/j.nutres.2018.06.001