

The Benefits of Berberine

Many people are familiar with the deep yellow color and the intense bitter flavor of goldenseal extract (*Hydrastis canadensis*). What most do not know is that the compound responsible for this characteristic color and taste is berberine—an isoquinoline alkaloid present in goldenseal and numerous other medicinal plants. Barberry root (*Berberis vulgaris*) and Oregon grape root (*Berberis aquifolium*) are other examples of berberine-rich plants that have been used in herbal medicine traditions for millennia. Modern research shows that berberine HCl, an isolated phytochemical from these plants, has its own potent therapeutic benefits.* In a broad sense, berberine benefits four areas of human physiology: glucose metabolism, lipid metabolism, gastrointestinal health, and cellular health.* The following is a brief discussion of berberine benefits and the associated dosing recommendations.

Healthy Glucose Metabolism*

A meta-analysis of 14 clinical studies and 1068 participants reported berberine to support healthy glucose metabolism at dosages ranging from 500mg to 1500mg per day.*¹ The most robust finding of this analysis was that berberine may be combined with oral hypoglycemic medications. Berberine appears to influence glucose metabolism by mechanisms that differ from pharmaceutical medications: it increases expression of insulin receptors, promotes insulin sensitivity, and supports production of glucagon-like peptide-1 (GLP-1).^{*2,3,4}

Healthy Lipid Metabolism*

A meta-analysis of 11 clinical studies reported berberine to improve lipid metabolism within normal limits when compared with placebo or standard therapy.*⁵ In one clinical trial, a dosage of 1500mg per day for 12 weeks supported healthy lipid metabolism* and other effects.*⁶ Studies suggest that berberine influences lipid metabolism by mechanisms that promote cholesterol receptor expression on hepatocytes and mediate bile acid turnover.*^{7,8} These mechanisms may be unique to berberine.⁹

Gastrointestinal Health*

Berberine-containing plants have a long history of use in Chinese, Ayurvedic, and Western herbal medicine for promoting a healthy complement of microflora in the gastrointestinal tract.* Animal studies are consistent with the traditional use.^{10,11} A human clinical trial that evaluated four different dosages of berberine, ranging from 5mg/kg per day for 5 days to 10mg/kg per day for 10 days, reported that the highest dosage of berberine was the most effective at supporting gastrointestinal microbial balance.*¹² Berberine is often used in combination with other compounds, such as artemisinin, garlic, gentian, goldenseal, or Oregon grape to support gastrointestinal detoxification or promote a healthy balance of intestinal microflora.*

Cellular Health*

Berberine appears to offer protection for cellular health of the gastrointestinal tract in certain subjects with an oral dosage of berberine as low as 900mg per day.*¹³

Berberine Dosing Recommendations

Clinical studies have evaluated berberine (berberine HCl) at dosages ranging from 500mg to 1500mg per day for as long as six months in adults.¹ The most common and most effective dosage appears to be 1500mg a day, given in three divided doses with meals. There is insufficient evidence to support its use in children.

The most common side effect of berberine supplementation is gastrointestinal discomfort. Postprandial and divided dosing is an effective strategy to minimize this risk.¹ If gastrointestinal irritation continues, the dosage can be decreased accordingly.

Drug-Nutrient Interactions

Berberine is metabolized by cytochrome P450 enzymes and inhibits CYP3A4, posing a potential interaction with numerous pharmaceutical medications.^{14,15}

Sarah Cook, ND

Sarah Cook is a freelance medical writer in Westminster, CO. She has a certificate in biomedical writing from the University of the Sciences in Philadelphia, PA and a naturopathic doctorate from the Southwest College of Naturopathic Medicine in Tempe, AZ. She has previous experience in clinical practice, supplement sales, and academics. In addition to writing, she is currently a faculty member at the Nutrition Therapy Institute in Denver, CO.

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