

Niacin

COMMON NAME: Niacin, Vitamin B3, Nicotinic acid

SCIENTIFIC NAME: 3-pyridinecarboxylic acid; C6H5NO2

RECOMMENDED WITH CAUTION

LEVELS OF EVIDENCE



Recommended:

Several well-designed studies in humans have shown positive benefit. Our team is confident about its therapeutic potential.



Recommended with Caution:

Preliminary studies suggest some benefit. Future trials are needed before we can make a stronger recommendation.



Not Recommended - Evidence:

Our team does not recommend this product because clinical trials to date suggest little or no benefit.



Not Recommended - High Risk:

Our team recommends against using this product because clinical trials to date suggest substantial risk greater than the benefit.

Evaluated Benefits

Increase of HDL-cholesterol

Mild decrease of LDL-cholesterol and VLDL-cholesterol

Reduction in triglyceride levels

Reduced plasma concentration of the proatherogenic lipoprotein a

Source

Vitamin B3 is composed of niacin (nicotinic acid) and its amide, niacinamide, and can be found in many foods, including yeast, meat, fish, milk, eggs, green vegetables, coffee, and cereal grains. Dietary tryptophan, found in protein-containing foods such as red meat, poultry, eggs, and dairy products, is also converted to niacin after ingestion.

Indications/Population

Patients with high total cholesterol

Patients with low HDL cholesterol

Mechanism of Action

Niacin is metabolized to form niacinamide adenine dinucleotide (NAD), niacinamide adenine dinucleotide phosphate (NADP), and nicotinuric acid, all coenzymes necessary for cell function. Niacin is a coenzyme used in anabolic reactions, such as lipid and nucleic acid synthesis, which require NADPH as a reducing agent. Niacin inhibits free fatty acid release from adipose tissue, and it inhibits cyclic AMP accumulation, which controls the activity of triglyceride lipase and, hence, lipolysis. It also decreases the rate of liver synthesis of LDL and VLDL, and increases the rate of chylomicron triglyceride removal from plasma, secondary to increased lipoprotein lipase activity.

Niacin improves the entire lipid panel in patients with dyslipidemia, lowering apolipoprotein-B-containing lipoproteins and raising apolipoprotein-A-containing lipoproteins (e.g., high-density lipoproteins).

Side Effects

- Niacin, particularly in large doses, may cause insulin resistance, hyperglycemia, and hyperinsulinemia.
- May increase plasma homocysteine levels by up to 55%.
- Minor or major adverse events include cutaneous flushing, pruritus, and gastrointestinal upset. The flushing can be ameliorated with 162 mg of aspirin with water one hour beforehand.
- Both niacin and HMG-CoA reductase inhibitors may elevate liver function tests or result in hepatotoxicity, and transaminase levels should be monitored.
- In patients with gout, elevated serum uric acid levels have been observed with niacin therapy.
- Hypothyroidism and its associated alterations in thyroid hormone and binding globulin tests.
- May not decrease cardiovascular events over benefit of statin and aspirin alone.

Dosing

1,200–1,500 mg daily to raise HDL

2,000 mg daily to raise HDL and lower triglycerides

Concomitant NSAIDs or aspirin are often recommended during the first 1–2 weeks to reduce flushing (likely prostaglandin-mediated); aspirin (325 mg), ibuprofen (200 mg), naproxen, and indomethacin have been shown to significantly reduce the incidence of flushing.

Drug Interactions/Cautions

Nicotinamide, also known as niacinamide and nicotinic acid amide, is the amide of nicotinic acid (vitamin B3/niacin). Nicotinamide is a water-soluble vitamin and is part of the vitamin B group. Nicotinic acid, also known as niacin, is converted to nicotinamide in vivo, and, though the two are identical in their vitamin functions, nicotinamide does not have the same pharmacologic and toxic effects of niacin, which occur incidental to niacin's conversion. Thus nicotinamide does not reduce LDL cholesterol or cause flushing.

Notes

In preliminary studies, inositol hexanicotinate, an ester of niacin and inositol, has also been shown to share some beneficial effects with niacin without causing the adverse effects associated with niacin administration.

References

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