

Vitamin B6 (Pyridoxine)

Vitamin B6 (Pyridoxine) is a water soluble vitamin that requires frequent ingestion for adequate levels. Pyridoxine helps amino acid and protein metabolism. The vitamin also helps with heme synthesis and neurotransmitters. Pyridoxine is indicated for patients taking isoniazid, experiencing dietary deficiency, and suffering from premenstrual syndrome. Side effects include neurological effects, such as ataxia or peripheral neuropathy. Vitamin supplementation is contraindicated in patients taking levodopa. Rich dietary sources of pyridoxine include organ meats, poultry, fish, potatoes, and fortified cereals.



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Mechanism

Amino Acid and Protein Metabolism

[Amigo-lemon and Mr. Protein with Metal-balls](#)

Pyridoxine helps with amino acid and protein metabolism. After being converted into its active form, pyridoxine is essential for proper enzymatic functions. Some of these enzymes convert vitamins and minerals into dietary forms. Other enzymes help with lipid metabolism.

Heme Synthesis

[Heme-man](#)

The active form of pyridoxine serves as a coenzyme that helps with hemoglobin synthesis, which binds to two sites on hemoglobin to increase the protein's ability to bind to oxygen.

Neurotransmitters

[Nerve-transmitter](#)

After being converted into its active form, pyridoxine serves as a cofactor in the biosynthesis of various neurotransmitters. The active form of pyridoxine helps synthesize serotonin, dopamine, epinephrine, norepinephrine, and GABA.

Indications

Adjunct to Isoniazid

[Adding-junk to Ice-knight-zit](#)

Isoniazid is a drug given during tuberculosis treatment (refer to the Picmonic on "Isoniazid"). The medication prevents pyridoxine from converting to its active form and may lead to symptoms of deficiency such as peripheral neuritis. Pyridoxine supplementation is administered concurrently with isoniazid to prevent vitamin deficiency.

Dietary Deficiency

[Broken Nutritional-plate](#)

Poor diet, administration of isoniazid, and inborn errors of metabolism may lead to pyridoxine deficiency. Although pyridoxine deficiency is rare in the general population, nearly 30% of alcoholics have pyridoxine deficiency. Symptoms of dietary deficiency include dermatitis, microcytic anemia, peripheral neuritis, convulsions, depression, and confusion. Patients who are pregnant or breastfeeding require increased pyridoxine intake.

Premenstrual Syndrome (PMS)

PMS-periods

Patients experiencing premenstrual syndrome (PMS) may have pyridoxine deficiency. Pyridoxine may be administered in women suffering from PMS symptoms such as breast pain. Vitamin supplementation may help balance hormonal changes and alleviate symptoms of PMS.

Side Effects

Ataxia

A-taxi

Side effects are not typically seen in patients taking low doses of pyridoxine. However, extremely high doses may lead to neurologic injury such as ataxia. Ataxia is characterized by involuntary muscle coordination.

Peripheral Neuropathy

Purple-wavy Neuron-extremities

Patients taking high doses of pyridoxine may experience peripheral neuropathy. The condition manifests as numbness of the hands and feet.

Contraindications

Levodopa

Levitating-L-Doberman

Pyridoxine interferes with the anti-Parkinsonian medication levodopa (refer to the Picmonic on "Levodopa/carbidopa (Sinemet)"). Since concurrent administration is contraindicated, patients taking levodopa should be instructed not to take pyridoxine supplementation.

Considerations

Cereals and Meats

Cereal and Meat

Highly fortified cereals and soy products are good sources of pyridoxine. Noncitrus fruits and starchy vegetables such as white potatoes also provide dietary pyridoxine. Pyridoxine is also found in fish and poultry. Organ meats such as beef liver are especially rich sources of pyridoxine.