

## Vitamin B6

Vitamin B6 is a water soluble vitamin which comprises pyridoxine, pyridoxal and their 5-phosphate esters.

Vitamin B6 is widely distributed in food and is dephosphorylated by alkaline phosphatase in the gut for absorption. Following absorption ATP-dependent phosphorylation restores phosphate ester forms. Vitamin B2 dependent oxidases oxidise pyridoxine 5-phosphate and pyridoxamine 5-phosphate to pyridoxal 5-phosphate (PLP) which is the active coenzyme form of Vitamin B6.

Measurement of PLP and its precursor (pyridoxal) are used to assess vitamin B6 status.

## Deficiency

Vitamin B6 is important for many metabolic reactions, particularly serotonin and tryptophan formation. Vitamin B6 is an essential cofactor for aminotransferase enzymes.

Deficiency may occur in the diet, due to drugs such as isoniazid and penicillamine, and as an inborn error.

Deficiency of Vitamin B6 leads to increased homocysteine levels. Iron absorption is also compromised.

Symptoms of deficiency are

- Skin changes (scaling, hyperpigmentation)
- Inflammation of tongue
- Depression
- Irritability

## Toxicity

Use of mega dose Vitamin B6 (up to 6000mg/day compared with a reference nutrient intake several order of magnitude lower) has been described eg

- Cystathionase deficiency
- Type 1 primary hyperoxaluria (AGT enzyme needs Vitamin B6 as cofactor)
- Idiopathic carpal tunnel
- PMT
- Schizophrenia
- Autism

Vit B6 toxicity results in peripheral neuropathy and encephalopathy.

Elevated Vitamin B6 may be seen with hypophosphatasia (low alkaline phosphatase) which may present with failure to thrive, developmental delays, defective skeletal mineralization resulting in rickets/osteomalacia and dental problems.

## Reference ranges

Adult = 35 – 110 nmol/L (as whole blood PLP)

Source: Chromsystems

<20 nmol/L whole blood PLP associated with high risk of deficiency

## Specimen type

EDTA or lithium heparin WHOLE BLOOD

Protect from light

Minimum volume 200 µL

## Storage

Freeze asap after collection

## Transport

First class post, ambient temperature.  
Protect from light.

## Address for specimens

Department of Clinical Biochemistry  
Rotherham Hospital  
Moorgate Road  
Rotherham, S60 2UD

## Cost

Contact - neil.cuthbert@nhs.net

## Turnaround

HPLC assay measuring physiologically active form of vitamin B6 (pyridoxal 5-phosphate - PLP) carried out at least every 2 weeks

## Accreditation

Accredited to UKAS ISO15189

## External QA

Instand e.V.

## Contact person

Consultant Clinical Scientist  
rgh-tr.biochemistry@nhs.net  
Tel 01709 820000 (Hospital)  
Tel 01709 424051 (Secretary)

(May 2024 v9)



**The Rotherham**  
NHS Foundation Trust