



TECHNICAL NOTICE

SOUTH BEND MEDICAL FOUNDATION

June 2009

Vitamin A (Retinol) by HPLC

Effective Date: June 1, 2009

Performing Department: Manual Laboratory

Method: High Performance Liquid Chromatography (HPLC)

Use: Quantitation of circulating Vitamin A (retinol) concentration

Clinical Significance:

Vitamin A (retinol) is a fat-soluble vitamin that is required for proper vision, growth and normal tissue development. The earliest clinical manifestation of Vitamin A deficiency is vision loss in dim light (night blindness). Two sources of Vitamin A in the diet include preformed vitamin A that is most often present in the form of retinyl ester and the carotenoids (including beta-carotene). They are subject to emulsification and mixed micelle formation by the action of bile salts before being transported into the intestinal cell. The efficiency of absorption of preformed vitamin A is high at between 70–90%. Carotenoids are absorbed into the duodenal mucosal cells by passive diffusion and their absorption efficiency is much lower at between 9 to 22%. Preformed vitamin A is obtained from animal-derived foods, such as organ meats and fish oils. Other sources are full cream milk, butter and fortified margarines. The carotenoids are obtained from yellow to orange pigment fruits and vegetables and green leafy vegetables, such as pumpkin, carrots, tomatoes, apricots, grapefruit, lettuce and most green vegetables. The U.S. National Health and Nutrition Examination Survey (NHANES-II) indicated that approximately 25% of the vitamin A requirement was provided by carotenoids and about 75% by preformed retinol. Vitamin A deficiency can be seen secondary to lack of dietary preformed Vitamin D and carotenoids in malnutrition or lack of adequate intestinal absorption (malabsorption).

Excess of Vitamin A can lead to toxicity with nausea and vomiting, anorexia, weakness and dermatitis. Skeletal abnormalities can occur in children with Vitamin A toxicity. Ingestion of large amounts of liver (where considerable Vitamin A is stored) can lead to toxicity. Polar bear liver has toxic amounts of Vitamin A.

Measuring the plasma concentration of vitamin A is the most convenient and widely used method to assess vitamin A status. However, it is not an ideal indicator because it does not decline until liver stores become critically depleted.

Reference Range: 0.3–1.2 mg/L

Specimen Requirements and Collection:

Patient Preparation:

- Fasting for at least 8 hours
- Recommend abstaining from alcohol for 24 hours before specimen collection

Preferred Specimen: • Serum from gold top (SST) or red top (serum) tube

Alternate Specimen: • Plasma from lavender top (EDTA) tube

Requested Volume: • 1.0 mL

Minimum Volume: • 0.5 mL

Processing: • After collection, protect collected serum or plasma from light, promptly separate from cells and refrigerate

Stability: • 12 hours refrigerated (2-8°C) and protected from light • 1 month frozen (-20°C) and protected from light

Storage/Transport: • Frozen and protected from light

Testing Schedule: • Tuesday and Friday • If specimen received by 7:00 am, results available by 5:00 pm same day

Order: • Vitamin A, Serum or Plasma Test #: 23302 CPT: • 84590

Please direct questions or comments regarding this notice to William J. Kaliney, M.D., Deborah H. Sun, Ph.D., or Sherrie White of South Bend Medical Foundation, (574) 234-4176 or (800) 544-0925.

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