

Best Practice Guideline

Vitamin D Deficiency

I. Diagnosis and Screening

Definition: Deficiency: Vitamin 25 (OH) D less than 20 ng/ml

Insufficiency: Vitamin 25 (OH) D between 21 to 29 ng/ml

a. Laboratory

- Use serum Vitamin 25 (OH)D level to evaluate vitamin D
- Only use serum Vitamin 1,25 (OH) 2 D when monitoring inherited disorders of vitamin D and phosphate metabolism
- Other labs to order in patients with vitamin D level < 10 (at risk for osteomalacia)
 - Calcium, phosphorus, alkaline phosphatase, PTH, BUN, creatinine, electrolytes
 - Celiac evaluation when with continued vitamin D despite adequate treatment
 - Radiographs in certain settings like presence of bone pain to rule out fractures or rickets and osteomalacia

b. Measuring Vitamin D: ICD-10 Diagnosis that support medical necessity

- Vitamin D Deficiency
- Rickets
- Osteomalacia
- Osteoporosis
- Osteopenia
- Hypercalcemia
- Primary Hyperparathyroidism
- Secondary hyperparathyroidism, renal origin
- Secondary hyperparathyroidism, non-renal origin
- Hyperparathyroidism unspecified
- Hypoparathyroidism
- Chronic Kidney Disease Stage 3-5
- ESRD
- Hypercalcemia
- Hypocalcemia
- Disorder of Phosphate Metabolism
- Disorder of Bone and cartilage unspecified

II. Treatment

a. Prevention

- RDA Intakes of Vitamin D to prevent overt deficiency (Endocrine Society)
 - Infants to 18 years old : 400 to 1000 units
 - Adults 18 years and older : 1500 to 2000 units
 - Lactation : 4000 to 6000 units if the infant is not receiving 400 units daily

b. Management

- **Supplement with cholecalciferol (D3) rather than ergocalciferol (D2) when available for prevention of deficiency**
- **Treatment Dosing Regimen**
 - **In patients with normal absorptive capacity, for every 100 units of vitamin D added, serum concentration increase by 0.7 to 1.0 ng/ml**
- **Vitamin D < 10**

- Vitamin D2 50, 000 2x/week for 8- 12 weeks
- Vitamin D 11-20
 - Vitamin D2 50, 000 once a week for 8-12 weeks
- Vitamin D 21-30
 - 1500 to 2000 units Vitamin D D3 daily
- For patients with malabsorption
 - High doses of vitamin D 10, 00 to 50, 000 units daily
 - Those who remain deficient, may need to be treated with hydroxylated vitamin D metabolites

a. Monitoring

- Patients being treated for Vitamin D deficiency (Initial level < 20),
 - Repeat vitamin D level measurement in 6 months after starting therapy
 - If levels increased substantially but not optimal, extend treatment to another 3-6 weeks of once a week of high dose D2 and D3 (50, 000)
 - If levels do not increase substantially, extend treatment for another 3-6 weeks of twice a week
- Patients being treated for vitamin D insufficiency only (initial vitamin D level 20 to < 30), no need for repeat Vitamin D level as long as taking maintenance vitamin D dose

III. Surveillance and Indication for Consultation

a. When to refer to Endocrinology

- After failure of 2 treatment courses of high dose vitamin D
- Concomitant granulomatous disease
- Concomitant primary hyperparathyroidism
- Concomitant malabsorption syndromes

IV. References

The Endocrine Society