

Effective Date: October 1, 2010

### Vitamin D Testing Protocol

For full protocol please go to website: [www.BCGuidelines.ca](http://www.BCGuidelines.ca)

This protocol covers the appropriate use of vitamin D testing for the general adult population ( $\geq 19$  years) in BC. It excludes patients with malabsorption syndromes, renal failure, unexplained bone pain, unusual fractures, and other evidence of metabolic bone disorders.

## A. LABORATORY TESTING

- Routine serum vitamin D testing or screening for vitamin D deficiency is not recommended.
- Routine serum vitamin D testing during vitamin D supplementation is not recommended.
- The optimum level of serum vitamin D, if one exists, has not been determined.
- Most BC residents are at risk of low vitamin D levels in the fall, winter and spring.
- Supplementing with vitamin D is safe and therefore supplementation is generally recommended.
- An exception to “no testing” includes some patients with advanced renal failure, mineral and/or bone disease.
- Specialist consultation is recommended for patients with malabsorption, unexplained bone pain, and unusual fractures, or suspicion of metabolic bone disorder.

## B. TREATMENT

### 1. Sunlight

- Amount of vitamin D produced by skin depends on surface area exposed, skin pigmentation, age, season, latitude and use of sun block.
- Canadian winters have insufficient UV radiation for adequate vitamin D production.
- UV is sufficient in summer and the suggestion is careful exposure of arms and legs for 10-15 minutes daily (risk of skin cancer due to sun exposure and tanning beds must be considered).

### 2. Food sources (See Table 1 on the reverse)

- Fish & eggs: Fresh salmon (wild or farmed), mackerel, tuna, sardines, cod liver oil, egg yolk (the latter less rich in vitamin D)
- Fortified foods: Milk (cow, soy, and rice) plus some orange juices
- Plant sources: No plant sources provide a significant amount

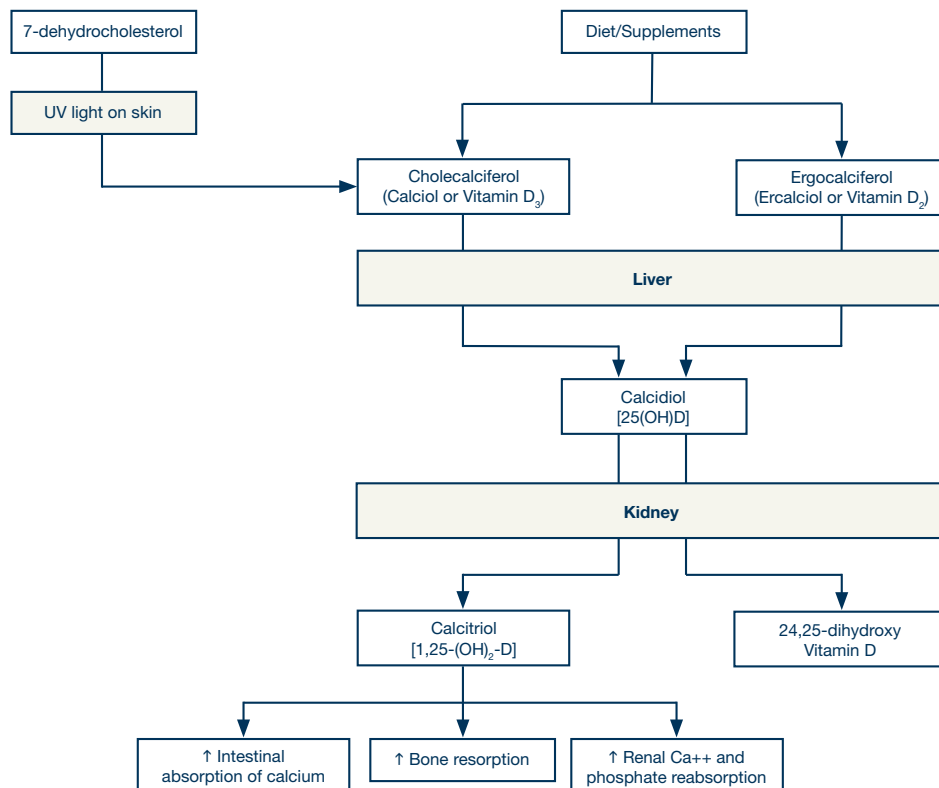
### 3. Supplements (See Figure 1 on the reverse)

- Recommended daily dose of  $D_3$  is 800-1000 IU (the optimum dose is unknown).
- Consider supplements in fall, winter and spring, as sunlight and diet are likely inadequate.
- There are two major forms: vitamin  $D_2$  (ergocalciferol) and  $D_3$  (cholecalciferol).
- $D_3$  is three times more effective and also the most common found in pharmacies OTC ( $D_2$  is available in high-dose preparations by prescription).
- Instead of daily dosing, patients can take  $D_3$  as 7000 IU weekly or 30,000 IU monthly (a single dose yearly is not recommended as evidence shows increased risk of fractures).
- Vitamin D toxicity is uncommon but if suspicious, check serum calcium (albumin-corrected total calcium or ionized calcium); if calcium is elevated, vitamin D level testing may be indicated.

**Table 1: Estimated Amount of Vitamin D Present in Some Foods**

Type of Food	Estimated Vitamin D Content (Approximate Content)
<b>Naturally present in food</b>	
Fresh salmon	100-250 IU per 100 g or 3.5 oz (farmed) 600-1000 per 100 g or 3.5 oz (wild)
Mackerel	80-250 IU per 100 g or 3.5 oz (canned)
Cod liver oil	400-1000 IU per 5 ml or 1 teaspoon
Tuna	41-105 IU per 100 g or 3.5 oz (canned) 380-690 IU per 100 g or 3.5 oz (fresh)
Sardines	70-360 IU per 100 g or 3.5 oz (canned)
Egg yolk	20-25 IU vitamin each
Mushrooms	18 IU per 100 g or 3.5 oz (white button) 96 IU per 100 g or 3.5 oz (cooked shiitake)
<b>Vitamin D-fortified foods (Canada)</b>	
Cow's milk	100 IU per 250 ml or 1 cup
Soy or rice milk	80 IU per 250 ml or 1 cup
Some orange juices	100 IU per 250 ml or 1 cup
Margarine	25 IU per 5 ml or 1 teaspoon

**Figure 1: Pathways of vitamin D synthesis\***



\* Adapted from Janssen HC, Samson MM, Verhaar HJ. Vitamin D deficiency, muscle function, and falls in elderly people. American Journal of Clinical Nutrition 2002;75:611-615.