Vitamin D – who to test and what does it mean?

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Clinical focus

Vitamin D and health in adults in Australia and New Zealand: a position statement

POSITION STATEMENT

Vitamin D and adult bone health in Australia and New Zealand: a position statement

Working Group of the Australian and New Zealand Bone and Mineral Society, Endocrine Society of Australia and Osteoporosis Australia*

Clinical focus

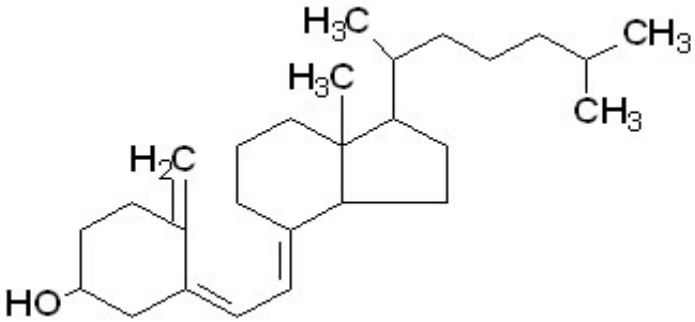
Guidelines

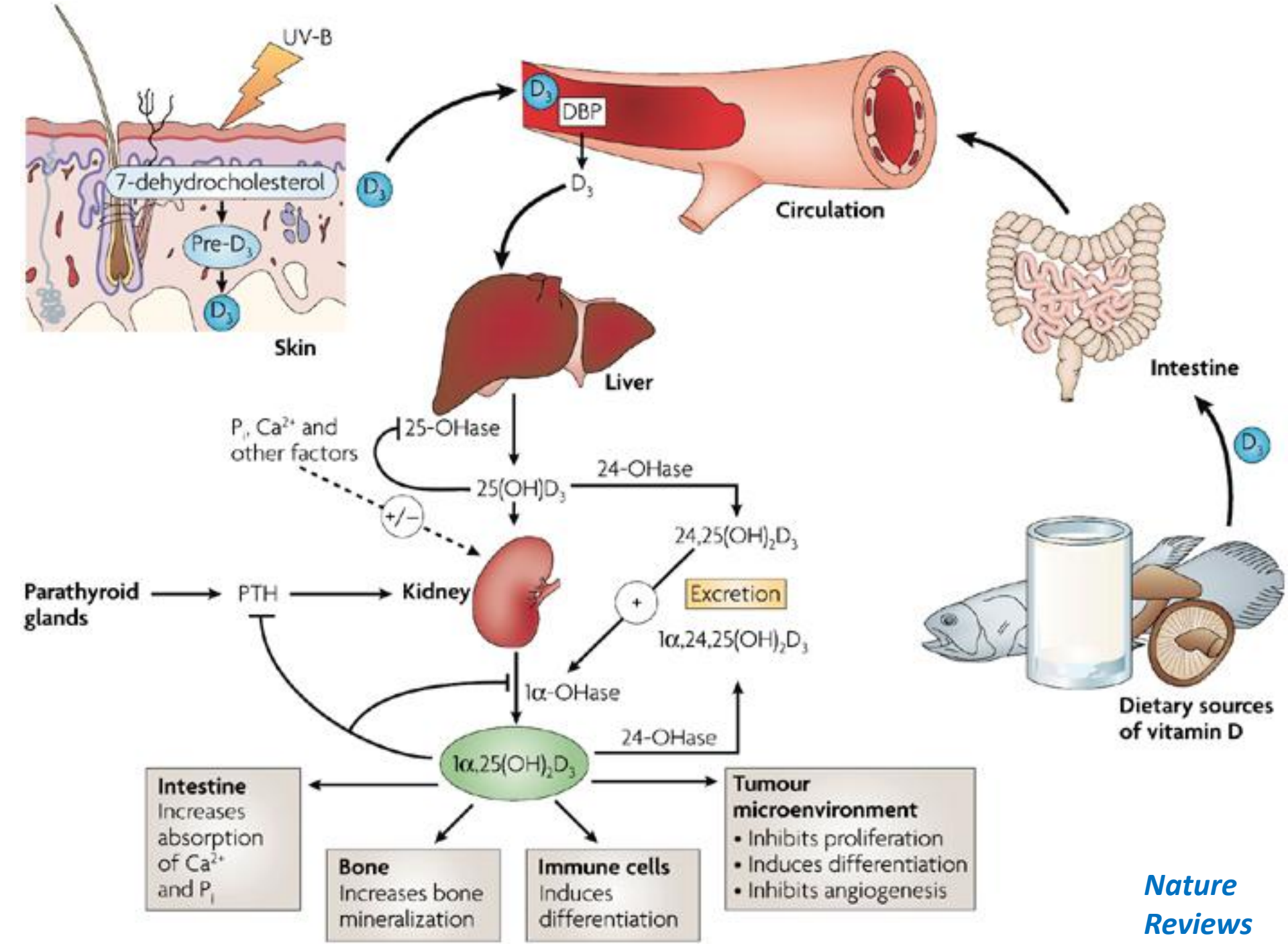
Vitamin D and health in pregnancy, infants, children and adolescents in Australia and New Zealand: a position statement

Medical Journal of Australia

Vitamin D

- Vitamin D3 – form made in skin
  (used in nearly all Australian medicines)
- Vitamin D2 – form in some medicine
  (rarely used in Australia)
- 25-OH D – liver Hydroxylation
  Major storage form
  Best measure of Vit D status
- 1,25-diOH D – kidney hydroxylation
  Active form, rarely useful to measure
- 24,25-diOH D; D epimer, bound/free





Nature Reviews

Effects of Vitamin D

Most clearly established effects:

- maintain calcium and phosphate homeostasis
- optimise bone health and muscle function

Therefore deficiency leads to

- Hyperparathyroidism
- Osteomalacia / osteoporosis
- Muscle weakness / falls

And important …

- Vitamin D treatment reduces fractures and falls

Disease Associations (1)

- Insulin resistance
- Cancer (colon, breast)
- Influenza type A
- Autoimmune disorders (RA, DM type 1)
- Multiple sclerosis
- Cardiovascular disease
- Schizophrenia
- Cognitive decline, depression
- Increased susceptibility to infection
- neurological conditions

Disease Associations (2)

- Little (if any) evidence that therapy helps
- Poor studies, confounding factors, observational
- Some “U shaped” observational studies
  - Mortality, schizophrenia, prostate cancer
  - Worse outcomes <30 and > 75 or 125 nmol/L

Who to Test

- Rickets, osteomalacia or osteoporosis
- Increased ALP with otherwise normal liver function tests
- Hyperparathyroidism, hypo- or hypercalcemia or hypophosphataemia
- Malabsorption (e.g. cystic fibrosis, short bowel syndrome, inflammatory bowel disease, untreated coeliac disease)
- Deeply pigmented skin, or avoidance of sun exposure for cultural or medical reasons
- Medications known to decrease 25OH-D levels (mainly anticonvulsants)
- Chronic renal failure and transplant recipients
- (“office workers”?)

Padiatrics

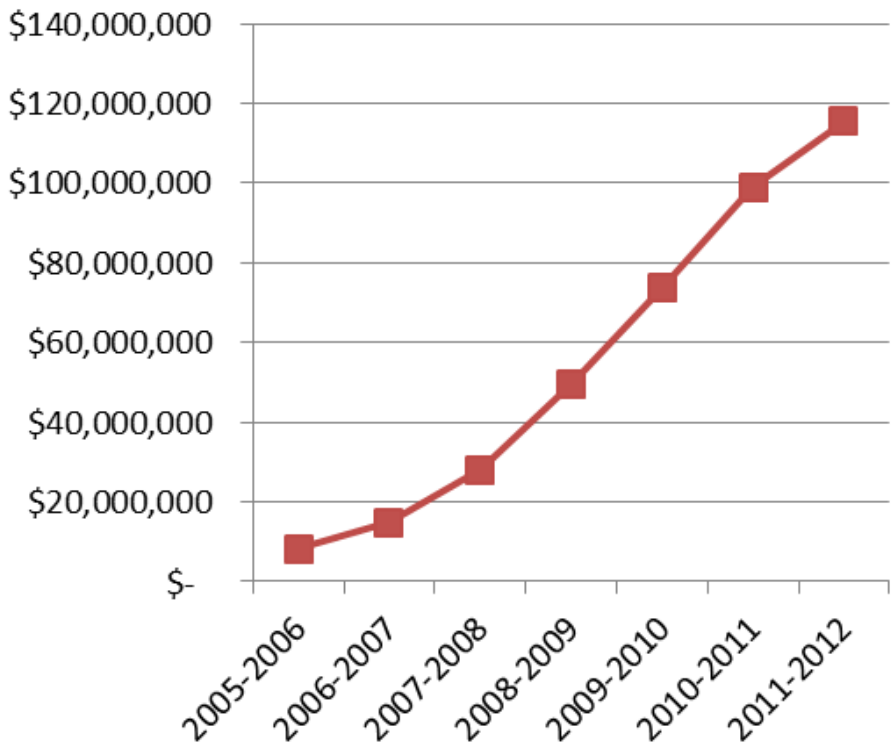
- Adult criteria plus…
- Infants of mothers with established vitamin D deficiency
- Exclusively breastfed babies in combination with at least one other risk factor
- Siblings of infants or children with vitamin D deficiency

How much is enough?

All of the following studies support a 25OH-D decision limit of 50 nmol/L:

- Vit D < 50 nmol/L associated with high PTH
- In therapy with Vit D and calcium PTH reduced if Vit V<50 nmol/L
- Observational study of 1200 men >65 years showed higher rates of hip bone loss are associated with Vit D <50 nmol/L
- Hip fracture more common with Vit D < 47.5 nmol/L

Vitamin D Medicare Statistics		
Year	number	Dollars
2005-2006	249,933	$ 8,297,776
2006-2007	445,854	$ 14,802,353
2007-2008	847,029	$ 28,121,363
2008-2009	1,492,904	$ 49,564,413
2009-2010	2,219,552	$ 73,689,126
2010-2011	2,982,650	$ 99,023,980
2011-2012	3,481,966	$ 115,601,271



SydPath Vitamin D