Vitamin D:
the new wonder nutrient?

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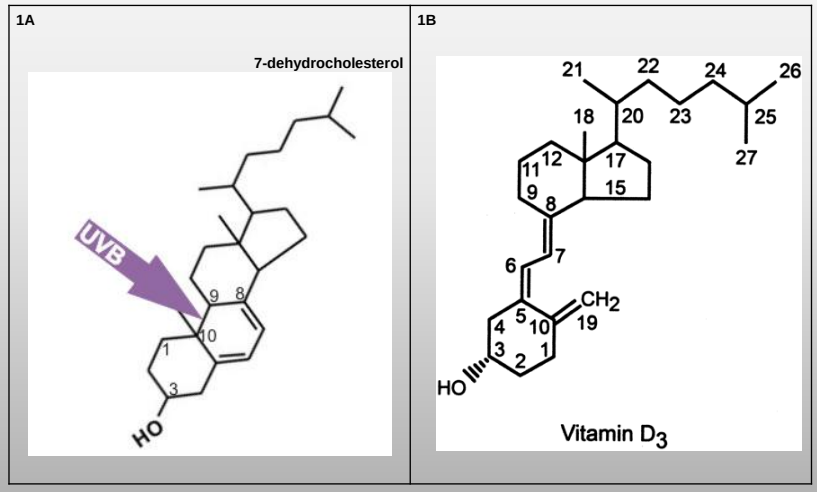
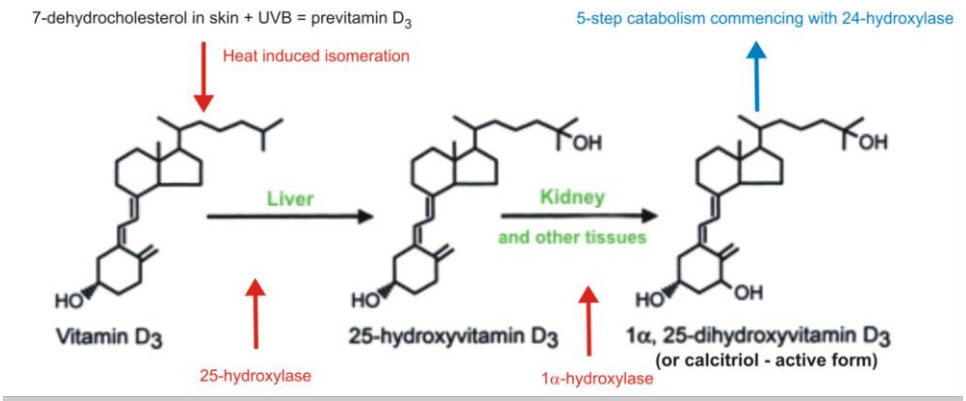
Overview

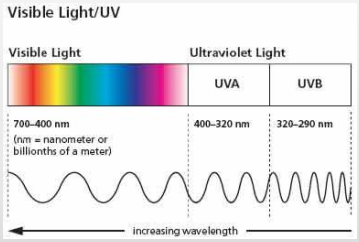
- Quick review of the vitamin that isn't a vitamin
- The numbers you need to know
- Evidence for fall prevention
- ACC supplementation programme
- Research in the wings

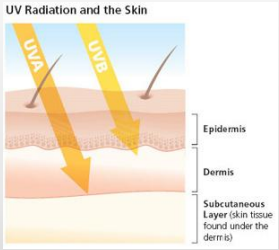
Vitamin D metabolism





Ultra-violet light





- UVB radiation stimulates the synthesis of vitamin D, UVA does not
- UVA penetrates more deeply into the skin
- UVB does not penetrate glass, UVA does

Adequacy and intake

- Current reference values for adequacy linked to bone health
  - Rickets, osteomalacia, calcium absorption
- >50 mmol/l deemed adequate (ANZBMS, IOM)

- Australia/NZ nutrient reference values (dietary intake)
  - Children 200 IU/day
  - Adults 200 IU/day
  - Older adults 400-600 IU/day

What is adequate?

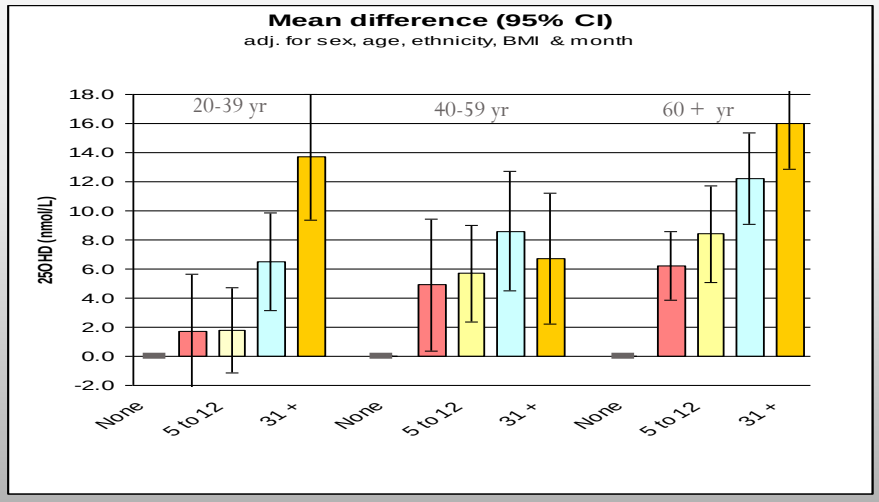
- Are these numbers realistic when outdoor workers and lifeguards have been shown to have serum concentrations > 160 mmol/l
- A recent UVB exposure study in Auckland adults (mean age 57 years) resulted in mean serum 25(OH)D concentrations of 95 nmol/l after 2 whole body exposures per week for 12 weeks

Older adults at increased risk of vitamin D deficiency

- physically inactive & do not get outdoors on a regular (eg. daily) basis
- increased BMI levels – vitamin D sequestered in adipose tissue
- Wear more clothing, "feel the cold"
- increased skin pigmentation

Note: UVB filtered by glass, vitamin D synthesis compromised

Difference in serum 25OHD (compared to no activity) by frequency of **outdoor activity** (times last month) by *age*



Scragg, *Am J Epidemiol* 2008; 168:577

Optimal 25(OH)D levels required to reduce falls

Cohort studies of 25(OH)D & risk of falls

Study	Country	25OHD cut-point	Falls risk
Snijder 2006	Holland	<25 nmol/L	2-fold increase
Faulkner 2006	US	≥ 50 nmol/L	50% increase
Pramyothon 2009	Hawaii	No association with 25OHD	

Dose & Frequency of vitamin D supplements effective in reducing falls: meta-analyses

Bischoff-Ferrari: *BMJ* 2009

- 19% reduction for vitamin D 600-1000 IU per day
- No effect with lower doses

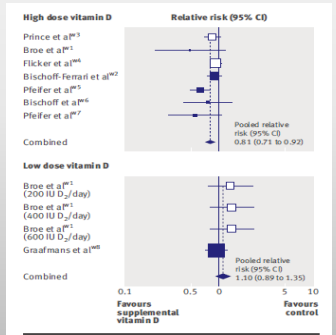


Fig 2 Fall prevention with high dose (700-1000 IU a day) and low dose (200-600 IU a day) of supplemental vitamin D. Boxes represent relative risks, and the size of the boxes is proportional to the size of the high dose supplemental vitamin D trials included in the primary analysis. Error bars represent 95% confidence intervals. Shaded boxes indicate trials with vitamin D_3, and white boxes indicate those with vitamin D_2

Gillespie, Cochrane Rev 2009

- Pooled RR 0.95 (95% CI 0.80, 1.14)
- Reduced risk in those with low 25(OH)D (<59.9 nmol/L)
  - Pooled RR 0.57 (0.37, 0.89)

A plug for ACC's residential supplementation programme

- A 2007 study showed that supplementation of vitamin D to people living in residential care could reduce falls by 28%
- Advisory group formed
- Prescribing criteria developed for GPs
- DHB/ PHO and ACC partnerships formed
  - 21 of 22 DHB's
  - In 2007 the national prescription rate of Vitamin D was 14% of residents. Target of 15,000 residents set.
  - At end of March 2011 the prescription rate of Vitamin D was 58% (24,653) of residents
  - The national target (aspirational) is 70%

Falls & Residential Care

- Falls are common in residents
- Two thirds will fall each year

- Following a fall, the resident is four times more likely to fall again within the year

Vitamin D in the Community Dwelling Environment

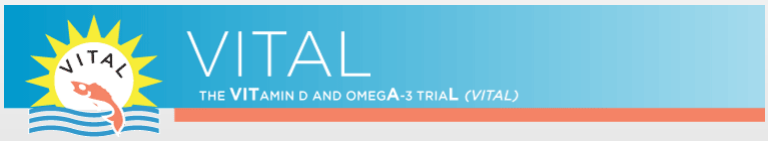
- ACC is keen to extend the successful residential care programme into the community setting for certain at risk target groups of the older adult population.
- Approximately 30% of community dwelling adults over 65 years will fall each year and falls generated over $110 million in claims to ACC in the 2009-2010 year.
- 95% of older adults live in the community

Vitamin D in health and disease

- Type 2 diabetes
- Cardiovascular disease
- Hypertension
- Cancer
- Auto-immune disease
- Respiratory infection
- Asthma and wheeze
- Depression, cognition and mood

Insufficient evidence on which to base recommendations – randomised controlled trials needed

Randomised controlled trials



Goal is for 20,000 participants

Recruitment started 2010

2,000 IU/Day vitamin D or 1g fish oil

Outcomes include CVD and diabetes

The Vitamin D Assessment (ViDA) Study

A New Zealand RCT (n=5,100): monthly 100,000 IU D3 or placebo for 4 years

Main outcome cardiovascular disease and respiratory illness

Secondary outcomes: falls and fractures

Commenced 2011

In conclusion

- Older people are at risk of vitamin D deficiency for a number of reasons
- However, the potential for endogenous synthesis of vitamin D still exists
- Insufficient evidence to support supplementation for prevention of any health conditions at this stage **other than** bone health and falls
- Rapidly growing area of scientific research

thanks

- Nutrition Foundation
- Prof Robert Scragg for slides 9-11, data on falls and vitamin D status by age
- ACC for material on the Residential Vitamin D supplementation programme