

# Where does D3 come from?

- D3 produced in the skin by exposure to sunlight
- Fair skinned person sunbathing makes 20 000 units *per hour at least*
- Very few dietary sources ( fish, fortified marg...need to eat huge amounts to get enough D3)
- Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr 2005;135(2):317-22.

# Where does D3 come from?

- 7 dehydro-cholesterol in the skin
- Converts to D3 in UVB exposure
- Liver hydroxylates to 25(OH)D in circulation, half life ( studies in submariners) 60 days
- Kidney and many other tissues converts to 1,25(OH)<sub>2</sub>D..which regulates calcium metabolism.

# What does 1,25(OH)<sub>2</sub>D actually do?

- Acts as steroid hormone
- Most organs show responsiveness and have receptors/relevant genes
- Increase the expression of antimicrobial peptides
- Suppress some inflammatory cytokines
- Have role in tumour genesis and in the immune response to infection

# Summary of most of the research

- Is at [www.vitamindcouncil.org](http://www.vitamindcouncil.org)
- Also see [www.healthresearchforum.org](http://www.healthresearchforum.org)

or review article

## **Diagnosis and management of vitamin D deficiency**

Simon HS Pearce,, Tim D Cheetham, Published  
11 January 2010, BMJ 2010;340:b5664

# So, what should GPs do to diagnose D3 deficiency?

- Test in
- Diabetes/Hypertension/CVS disease
- Include in “Tiredness/low mood” work up
- All those with other than transient musculoskeletal conditions ( pain, joint dysfunction, repeated fractures, RA, SLE etc)
- Bowel, lung and breast cancer

# What is the normal level of D3?

- Treat if level less than 30 is a simple rule of thumb that works in practice.
- If uneasy monitor levels after three months and a year

# How to treat D3 deficiency in children

**Maintenance** ( Abidec/Dalivit ) have only 400iu  
daily..appropriate maintainance for a child of any age

## **Treatment of deficiency**

less than 1 year; 3000 IU of colecalciferol daily (eg 20 000  
per week ) for 8 weeks

6000 IU daily ( 40 000 per week) after 1 year of age for 8  
weeks,

# How to treat D3 deficiency in children

then Dalivit or 20 000iu monthly

Alk Phosph takes 3 months to normalise

Cheetham et al recommend calcium for the first "weeks"  
50mg/kg

# Treating adults

- 20, 000 iu two daily for 10 days (=400, 000iu)
- BMJ (Jan 11 2010)says this may need to be repeated
- Then maintain on one 20,000 weekly or fortnightly
- Give **all nursing/rest home patients** a 10 day course and then maintenance at one 20 000 per week. This improves mood, reduces fractures and isnt constipating like adcal

**There is NO RISK of hypercalcaemia at this dose**

- There is NO RISK of hypercalcaemia at this dose
- Fears based on myths.  
**“No credible evidence of hypercalcaemia” : *BMJ* 2009;339:b5649**

# Practical Problems/FAQ

- Patients cant get colecalciferol
- **Available from IDRIS Pharmaceuticals Ltd**  
**Telephone number 01932 824100 Pharmacies**  
**can easily obtain it in a few days.**
- If pharmacies refusing to get it both you and the patient should report the matter to the medicines management team

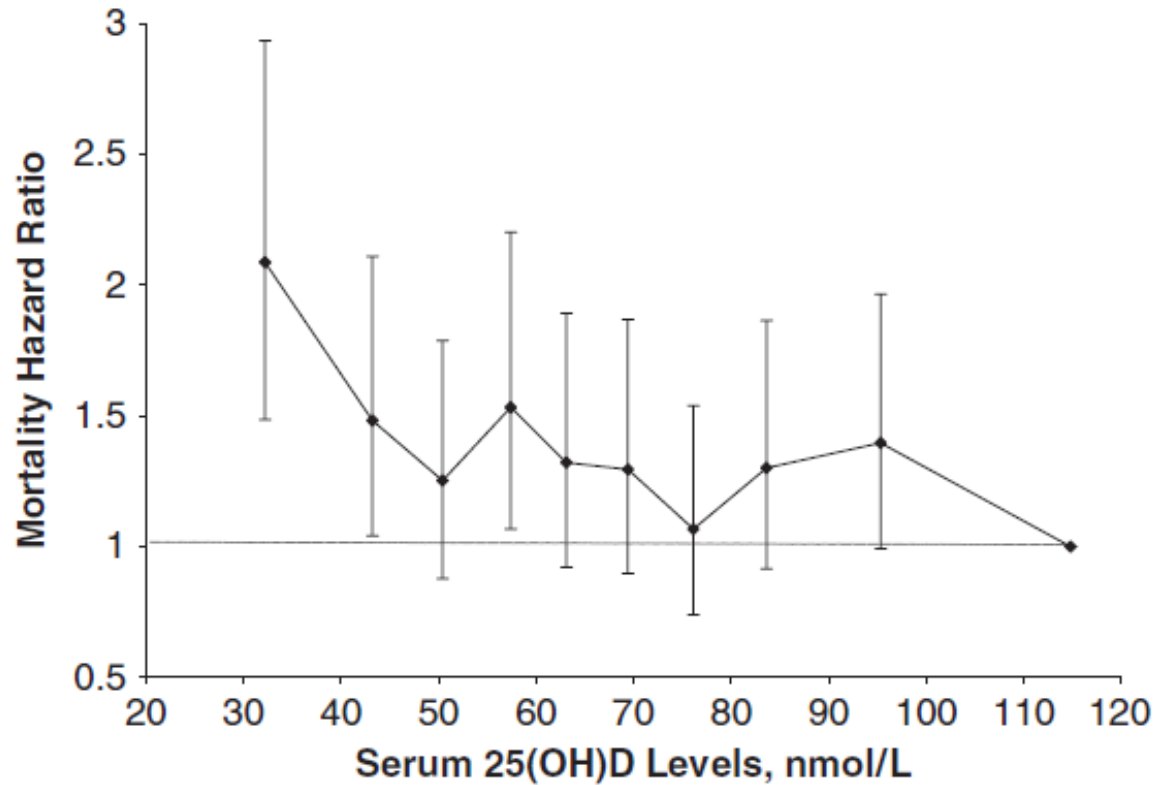
# FAQ

- Should I give calcium aswell?
- **In adequate replacement the Ca balance sorts itself out if OK diet. In osteoporosis, calcium absorption is affected so give Adcal or similar alongside**
- **Children probably need calcium initially**

# And the public health response?

- **We could be saving literally billions on health costs by treating Vit D deficiency.**
- It's cheap and easy
- Would improve bone health, reduce diabetes, MS, respiratory infections, pregnancy complications etc etc
- 10 million euros investment per year estimated to save 187,000 euro per year...

# NHANES



Ginde AA et al. J Am Geriatr Soc 2009

# Shouldn't we have RCT evidence?

- RCT are for situations of equipoise. There were never any RCTs of smoking in pregnancy/diabetes/ CVS disease/lung cancer. The epidemiology spoke and we acted.....

# BMJ this week

A recent nationwide survey in the United Kingdom showed that more than 50% of the adult population have insufficient levels of vitamin D and that 16% have severe deficiency during winter and spring.<sup>5</sup> The survey also demonstrated a gradient of prevalence across the UK, with highest rates in Scotland, northern England, and Northern Ireland.<sup>5</sup> People with pigmented skin are at high risk, as are the elderly; obese individuals; those with malabsorption, short bowel, or renal or liver disease; and individuals taking anticonvulsants, rifampicin, or highly active antiretroviral drugs.

## Ongoing research

More than 150 clinical trials of vitamin D are listed on [ClinicalTrials.gov](https://clinicaltrials.gov). Some key trials include:

The VITamin D and omegA-3 Trial (VITAL)

A study of colecalciferol 2000 IU daily, fish oil, or placebo in 20 000 older individuals (>60 yrs), with cardiovascular disease and cancer incidence as outcomes.

Vitamin D and Calcium Homeostasis for Prevention of Type 2 Diabetes (CaDDM) (NCT00436475 [[ClinicalTrials.gov](https://clinicaltrials.gov)] )

Evaluation of vitamin D requirements during pregnancy (NCT00292591 [[ClinicalTrials.gov](https://clinicaltrials.gov)] )

Development of vitamin D as a therapy for breast cancer—phase II (NCT00656019 [[ClinicalTrials.gov](https://clinicaltrials.gov)] )

## Ongoing

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Vitamin D supplement in preventing colon cancer in African Americans with colon polyps (NCT00870961 [[ClinicalTrials.gov](#)] )

Health benefits of vitamin D and calcium in women with PCOS (polycystic ovarian syndrome) (NCT00743574 [[ClinicalTrials.gov](#)] )

Vitamin D<sub>3</sub> supplementation and the T cell compartment in multiple sclerosis (MS) (NCT00940719)