Vitamin D and Tanning

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Vitamin D

- Vitamin? No, it is a hormone.
- Essential for health
- Active form (1,25 dihydroxy-vitamin D) is tightly regulated
- Key precursor is 25-hydroxy-vitamin D
Requirements/Sources of Vitamin D

- **Daily reference intake (DRI):**
  - 200 IU per day if age < 50
  - 400 IU/day if age 50-70
  - 600 IU/day if age > 70

- **Diet**
  - Dairy products (esp. milk, some OJ)
  - Fish oils (sardines, salmon, mackerel)
  - Polar bear liver has a lot

- **Dietary Supplements (400 IU)**
Sources of Vitamin D

- Photosynthesis in the skin
  - Requires UVB radiation
  - Little is needed
  - Latitude, time of day, and skin color are important factors
  - E.g. for someone of European background of average skin type who lives in the northern US: 5 min/day at noon, 3x/week, 6 months/yr
  - Or do we really need more?
Consequences of Too Little Vitamin D

- **Musculoskeletal**
  - In children: rickets
  - In adults: osteoporosis, fractures
  - In elderly: falls as well
  - These consequences are undisputed

- Multiple sclerosis?
- Hypertension?
- Depression?
- Cancer?
Forest Plots: Risk of Falling in Vitamin D-Treated Groups and Control Groups

Vitamin D Supplements and Risk of Falling

Primary Analysis

<table>
<thead>
<tr>
<th>Source</th>
<th>Odds Ratio (95% CI)</th>
<th>Favors</th>
<th>Favors</th>
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<tr>
<td>Pfeifer et al, 2000</td>
<td>0.47 (0.20-1.10)</td>
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<td>Bischoff et al, 2003</td>
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Secondary Analysis

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<th>Source</th>
<th>Length of Follow-up, mo</th>
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<td>Latham et al, 2003</td>
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<td>Trivedi et al, 2003</td>
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<td>Harwood et al, 2004</td>
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<td>Chapuy et al, 2004</td>
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<td>Larsen et al, 2002</td>
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Vitamin D and Cancer

Colorectal cancer
- Some observational studies suggest protective effect
- Perhaps only at certain levels of calcium intake
  Kampman et al, *Cancer Causes Control* 2000;11:459-466
- Evidence for an effect substantial, but not definitive at this point

Also breast cancer, prostate cancer, others
- Chan et al. *Cancer Causes Control* 1998;9:559-566
Vitamin D and Cancer

- **Melanoma**
  - Vitamin D hypothesized to prevent melanoma
    Garland et al, *Arch Environ Health* 1990;45:261-7
  - Case-control study did not support this hypothesis
  - A subsequent prospective but flawed study also failed to find an association
  - Effect on prognosis suggested
Study of Melanoma Prognosis

- Cohort of 528 melanoma cases followed for 5.4 years
- Solar elastosis associated with improved prognosis
- Suggested explanations
  - Vitamin D from sun
  - Sun induces less aggressive melanomas
- Analogy to SCC
- Notes:
  - No measures of sun exposure after diagnosis
  - No measures of vitamin D status

Vitamin D - Conclusions

- Obtained from diet, supplements, sun
- Minimal sun exposure may be sufficient
- Primary issue is musculoskeletal health
- DRI may need to be increased
- Colorectal cancer may be a risk
- Other connections not yet clear
Proposed conclusions:

- DRI may be too low
- If more needed, take a supplement
- Advice regarding sun exposure remains, because of skin cancer risks
Artificial Tanning and vitamin D

- Publication from Holick group
  - Convenience sample
  - Tanning lamps users had higher 25-OH vitamin D levels

- Concerns
  - Confounding by
    - Sun exposure
    - Multivitamin intake
    - Diet
    - Ethnic group
  - Sampling bias
  - Conflict of interest
    - Book sales
    - UV Foundation

Political Aspects

- Tanning industry promoting vitamin D as justification for tanning parlors
- UV Foundation is closely linked to that industry
- Artificial UV, if in the B range, may increase vitamin D
- A tanning lamp is more expensive, less convenient than a multivitamin