VITAMIN D Supplementation

1. The principal provitamin found in animal tissues is 7-dehydrocholesterol, which is synthesized in the skin.
2. Active form of vitamin D is known as Calcitriol [1α,25-dihydroxyvitamin D₃(1,25(OH)₂D₃)].
3. Vitamin D is actually a hormone rather than a vitamin.
4. The biological actions of vitamin D are mediated by the vitamin D receptor (VDR), a nuclear receptor.
5. The only foods that naturally contain vitamin D are seafood, mushrooms and egg yolks.
6. Breast milk does not contain vitamin D.
6.1. The recommended dietary allowance (RDA) of vitamin D for infants and children is 400 IU or 10 mcg, daily which approximates that in a teaspoon (5 mL) of cod liver oil: considered safe and effective in preventing rickets.
6.2. Recently, the American Academy of Pediatrics (AAP) recommended an intake of 400 IU of vitamin D per day from infants through adolescence.
7. Normal range of vitamin D levels in body: 30-40 ng/ml.

- Symptoms of vitamin D deficiency are
  - Bone discomfort or Pain (often throbbing) in low back, pelvis, lower extremities
  - Impaired physical function
  - Muscle aches
  - Proximal muscle weakness

- Dose of Vitamin D needed per day to obtain a normal vitamin D blood level
  - 100 IU per day increases vitamin D blood levels by 1 ng/ml
  - 200 IU per day increases vitamin D blood levels by 2 ng/ml
  - 400 IU per day increases vitamin D blood levels by 4 ng/ml
  - 500 IU per day increases vitamin D blood levels by 5 ng/ml
  - 800 IU per day increases vitamin D blood levels by 8 ng/ml
  - 1000 IU per day increases vitamin D blood levels by 10 ng/ml
  - 2000 IU per day increases vitamin D blood levels by 20 ng/ml
- For patients who are at risk of vitamin D deficiency (acc. to ESCP)
  o To achieve the blood levels upto 30 ng/ml

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age group (years)</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants &amp; children</td>
<td>0-1</td>
<td>1000 IU/day</td>
</tr>
<tr>
<td>Children</td>
<td>1 year &amp; older</td>
<td>1000 IU/day</td>
</tr>
<tr>
<td>Adults</td>
<td>19-50</td>
<td>1500-2000 IU/day</td>
</tr>
<tr>
<td>Elderly</td>
<td>50-70 &amp; 70+</td>
<td>1500-2000 IU/day</td>
</tr>
<tr>
<td>Pregnant &amp; lactating women</td>
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<td>1500-2000 IU/day</td>
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</tbody>
</table>

- For treatment and prevention strategies (acc. to ESCP)

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<tr>
<th>Patient</th>
<th>Age group (years)</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infants &amp; Toddlers</td>
<td>0-1</td>
<td>2000 IU/d x 6 weeks followed by maintenance therapy of 400-1000 IU/d</td>
</tr>
<tr>
<td>Children</td>
<td>1-18</td>
<td>2000 IU/d x 6 weeks followed by maintenance therapy of 400-1000 IU/d</td>
</tr>
<tr>
<td>Adults</td>
<td>18 years &amp; above</td>
<td>6000 IU/d x 8 weeks followed by maintenance therapy of 1500-2000 IU/d</td>
</tr>
<tr>
<td>Pts. with obesity &amp; malabsorption/on medications affecting vit. D levels</td>
<td></td>
<td>6000-10,000 IU/d followed by maintenance therapy of 3000-6000 IU/d</td>
</tr>
</tbody>
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- Medication affecting Vit D levels are
  o Antiepileptics
  o Corticosteroids
  o Heparin
  o Statins
  o Thiazide diuretics

- Also, the use of calcium and vitamin D has been associated with a small but significant increase in the risk for kidney stones. So, to be used cautiously.

- Dosage forms available for vitamin D are
  1. Oral
     a. Tablet: 60,000 IU
     b. Sachet: 60,000 IU
     c. Chewable: 60,000 IU
     d. Liquid suspension: 400 IU/ml
     e. Jelly: 10,000 IU as soft gel capsules
2. Parenteral
   a. Intramuscular injection (Ampoule): 6 lac IU

- **Hypervitaminosis D**: The amount of vitamin D necessary to cause hypervitaminosis varies widely. As a rough approximation, **continued daily ingestion of 50,000 units** by a person with normal parathyroid function and sensitivity to vitamin D may result in poisoning.