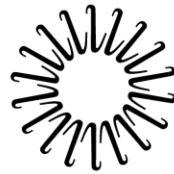


# Vitamins & Supplements



## **Lifespan Cardiovascular Institute**

**Rhode Island Hospital • The Miriam Hospital  
Newport Hospital**

*Delivering health with care.®*

Center For Cardiac Fitness  
Pulmonary Rehab Class  
The Miriam Hospital

# DSHEA 1994

- Dietary Supplement Health and Education Act (DSEA) of 1994
- Attempts to regulate supplements
- Defines non-prescription and non-OTC drugs

# DSHEA 1994

- Labels are required to state:
  - “This product is not intended to diagnose, treat, cure, or prevent any disease”
- **HOWEVER**, products can make health claims, such as:
  - “Promotes prostate health”
  - “Supports the circulatory system”

# DSHEA 1994

- Companies are NOT required to prove:
  - Safety
  - Efficacy
  - Quality
- Unobligated to report post-marketing data
- Burden of proof lies w/the FDA
  - Power to remove supplement only once harm has been PROVEN

# Fish Oil (Omega-3 Fatty Acids)

- Use
  - Heart disease
  - Triglyceride-lowering
- Mechanism of action
  - EPA + DPA – Stored in adipose tissue
- Dose
  - Cardio-protection – 1-2 gm/day
  - Triglyceride-lowering – 3-4 gm/day
  - HR + BP-lowering – ~750 mg/day
- Counseling pearls
  - Store in the freezer

## Approximate weekly fish consumption to achieve 250 mg/day of EPA + DHA

Fish	Preparation	Ounces
Anchovy	Canned	2
Farmed Atlantic Salmon	Fillet	3
Wild King Salmon	Fillet	3
Wild Pink Salmon	Canned	4
Wild Silver Salmon	Fillet	5
Sardine	Canned	6
Albacore Tuna	Canned	8
Scallops	Frozen	18
Shrimp	Frozen	20
Light Tuna	Canned	24
Catfish	Fillet	35
Cod	Fillet	40

EPA: eicosapentaenoic acid; DHA: docosahexaenoic acid.

# Vitamin B3 (Niacin)

- Use
  - Pellagra
  - LDL/triglyceride-lowering + HDL raising
- Mechanism of action
  - Component of NAD + NADP, which are responsible for:
    - Tissue respiration
    - Lipid metabolism
    - Glycogenolysis
  - Inhibits metabolism of VLDL + LDL
- Dose
  - Pellagra – 50-100 mg 3-4x/day
  - CHL – 1-2 gm/day
- Counseling pearls
  - Take at bedtime + w/325 mg of aspirin
  - Avoid hot showers, hot foods/drinks w/i 3 hours of dose
  - Consider avoiding if you have gout

# Ferrous Sulfate (Iron)

- Use
  - Anemia d/t iron deficiency
- Mechanism of action
  - Binds to red blood cells
- Dose
  - 150-200 mg elemental iron/day
- Counseling pearls
  - Nausea/constipation are dose-related
  - Take w/vitamin C to increase absorption
  - Take 2 hrs before or 4 hrs after antacids



# Ferrous Sulfate (Iron)

- Counseling pearls con't
  - Take w/food to prevent GI upset
    - Eat w/meat or fish
  - Do NOT eat w/:
    - High-calcium foods
    - Bran, oats, rye fiber
    - Tea, some vegetables and cereals
    - Soy protein

# Vitamin E

- Use
  - Anti-oxidant
  - Vitamin E deficiency
    - Alcoholics, cystic fibrosis, fat malabsorption, Celiac + Crohn's disease
- Mechanism of action
  - Prevents oxidation of vitamins A + C
  - Protects PUFAs from free radicals
  - Prevents platelet aggregation
- Dose
  - Supplement –  $\leq 400$  IU/day
  - Vitamin E deficiency – 200 IU/day

# Vitamin C (Ascorbic Acid)

- Use
  - Treat scurvy
  - Boost immune system
- Mechanism of action
  - Not well-understood
  - Helps build collagen
  - Helps convert folic acid
- Dose
  - Scurvy – 100-250 mg 1-2x/day x 2 weeks
  - Immunity – 1-3 gm/day
  - Supplement – 50-200 mg/day

# Melatonin

- Use
  - Regulate circadian rhythm → Treat insomnia
- Mechanism of action
  - Act on melatonin receptors in the body
- Dose
  - Insomnia – 0.3 mg/day (30 minutes before bedtime)
    - Most pts take 3-10 mg/day
- Counseling pearls
  - Take at bedtime

# Calcium

- Use
  - Antacid
  - Phosphate binder (in pts w/CKD)
  - Prevention + tx of osteoporosis (w/vitamin D)
- Mechanism of action
  - Neutralizes pH of stomach acid
  - Increases tone of lower esophageal sphincter
  - Slows the rate of bone loss
  - Binds to phosphate + forms Ca-Phos complex

# Calcium

- Dosage forms
  - Calcium carbonate
  - Calcium citrate (for pts on PPIs)
- Dose
  - 500 mg elemental calcium 2-3x/day
    - Carbonate (w/meals)
    - Citrate (empty stomach)
- Counseling pearls
  - Avoid doses >500 mg at a time

## Foods and drinks with calcium

Food	Calcium, milligrams
Milk (skim, 2 percent, or whole, 8 oz)	300
Yogurt (6 oz)	250
Orange juice (with calcium, 8 oz)	300
Tofu with calcium (1/2 cup)	435
Cheese (1 oz)	195-335 (hard cheese = higher calcium)
Cottage cheese (1/2 cup)	130
Ice cream or frozen yogurt (1/2 cup)	100
Soy milk (1 cup)	100
Beans (1/2 cup cooked)	60-80
Dark, leafy green vegetables (1/2 cup cooked)	50-135
Almonds (24 whole)	70
Orange (1 medium)	60

# Vitamin D

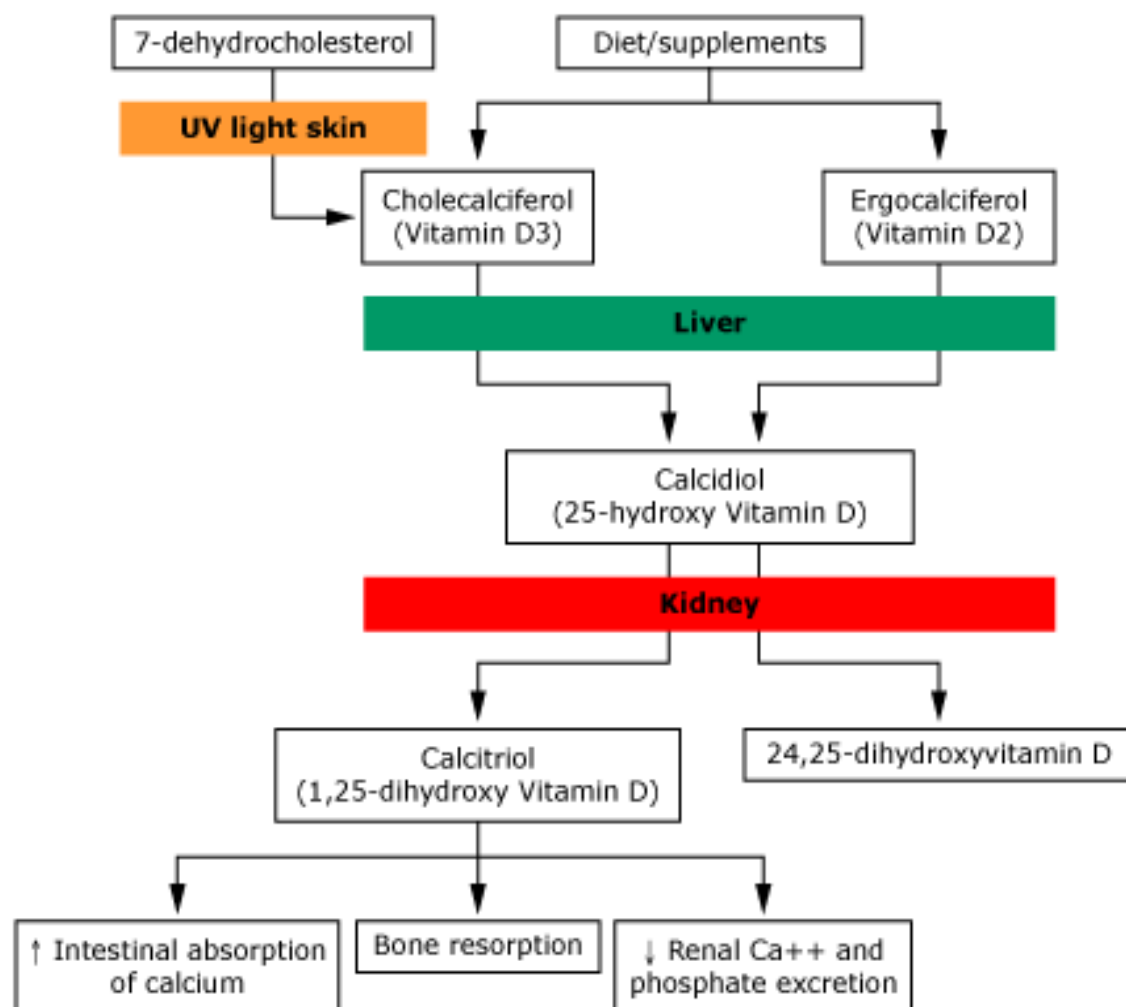
- Use
  - Tx vitamin D deficiency
  - Enhance/improve calcium absorption
- Mechanism of action
  - Vitamin D from diet or the sun →
  - Liver converts it to calcidiol →
  - Kidney converts calcidiol to 24, 25-dihydroxy vitamin D & calcitriol
  - Improves bones, calcium absorption
  - Prevents kidneys from excreting calcium &



# Vitamin D

- Dose
  - Vitamin D deficiency –
    - 50,000 units weekly x 8 weeks, then 50,000 units monthly
      - Vitamin D2 (ergocalciferol) OR
      - Vitamin D3 (cholecalciferol) (Preferred – More active)
  - Calcium absorption/dietary –
    - 800 – 1000 units/day
- Counseling pearls
  - Do not exceed 4000 units/day
    - Increases calcium in urine & blood

## Pathways of vitamin D synthesis



Metabolic activation of vitamin D to calcitriol and its effects on calcium and phosphate homeostasis. The result is an increase in the serum calcium and phosphate concentrations.

# Vitamin B12 (Cyanocobalamin)

- Use
  - Vitamin B12 deficiency
    - Pernicious anemia
    - Gastric diseases
- Mechanism of action
  - Helps fat + carb metabolism
  - Helps produce protein + blood cells
- Dose
  - Vitamin B12 deficiency – 250 mcg PO/day
  - Pernicious anemia – 1000 mcg IM/deep SQ x 5 days, followed by 1000 mcg IM/deep SQ qmonthly

# Counseling Pearls

- Check w/MD or pharmacist first
- Not always well-studied
- Potential drug interactions (ex: warfarin)