

Healthy Eating for Maintaining Mobility as We Age



EMBOLDEN

Getting Out for Health

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Make Health Last. What will your last 10 years look like?



<https://www.youtube.com/watch?v=pFDuzJBhqek>

Mobility

“Our ability to move ourselves within the immediate environment and broader community”¹³.

- Vital to healthy aging
- An essential aspect of quality of life
- A critical component of most activities of daily living



Role of Nutrition

- Works together with physical activity for best outcomes
- Adds significantly to physical interventions



Outline

- The impact of aging on our muscles, bones and joints
- Key nutrients for muscles, bones, and joints:
 - **protein**
 - **vitamin D**
 - **calcium**
- Factors affecting our joint health

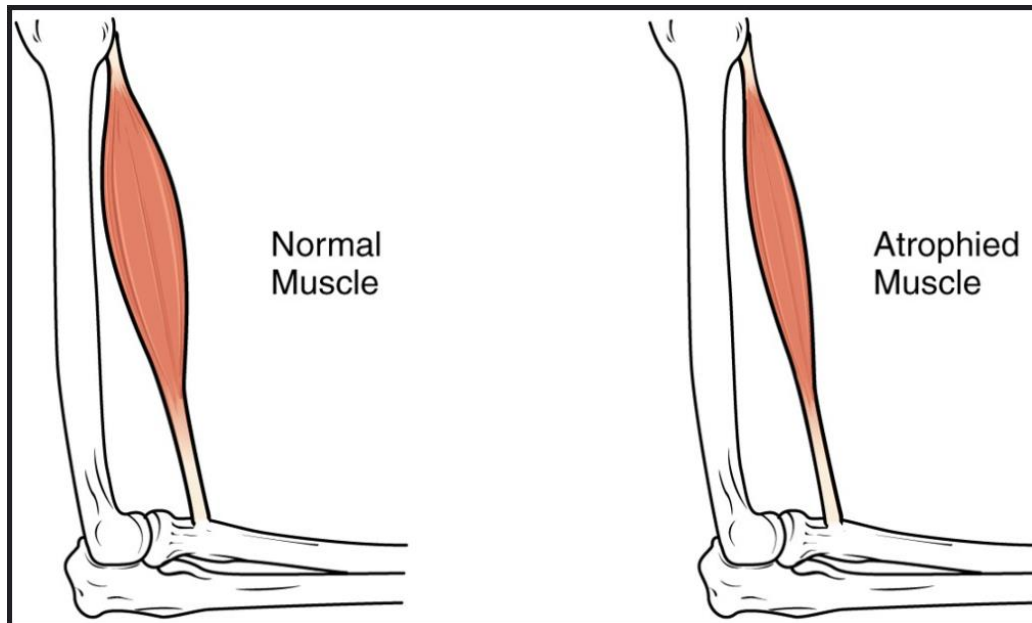
Skeletal Muscle

- Largest organ ^{4,11}
- **An organ of longevity**
- Locomotion
- Site for glucose and fat metabolism
- Marker for our general health
- Muscle mass - critical for health

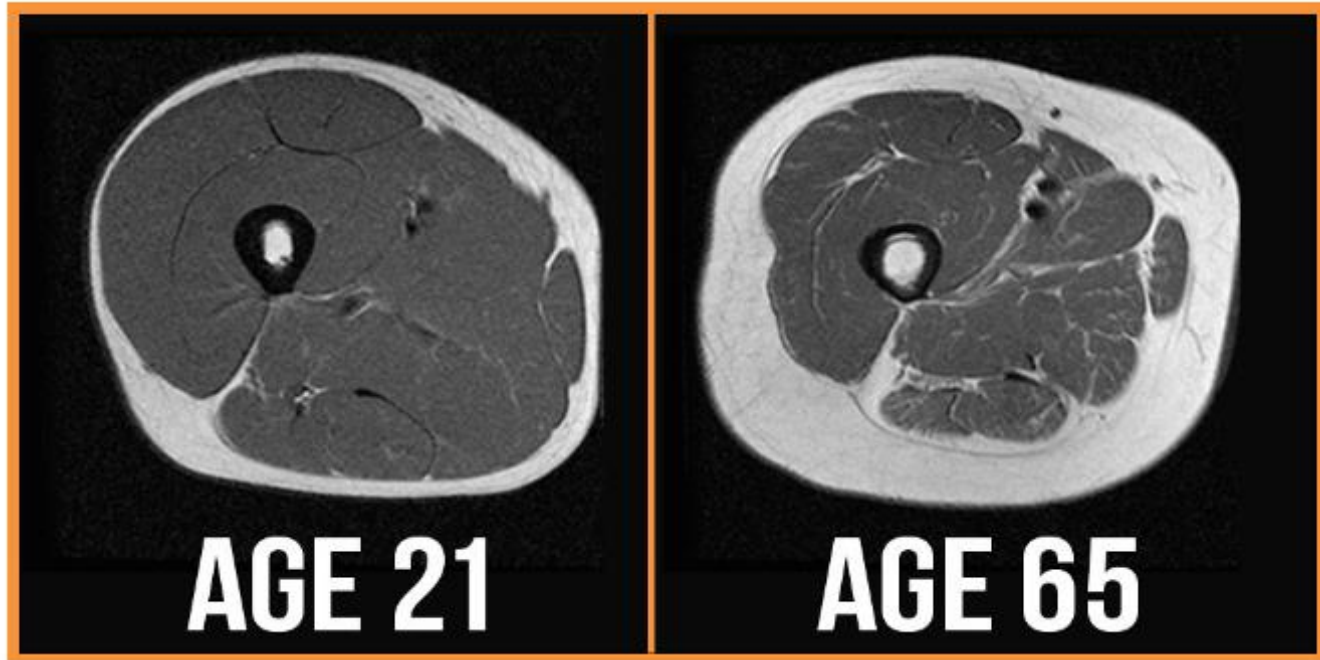


Impact on Muscles

- Muscle mass ↓: late 30s and 40s
- Muscle mass: ↓ **1%** per year after the age of 30



Impact on Muscles



AGE-RELATED CHANGES IN MUSCLE MASS IN THIGH CROSS-SECTIONAL AREA OF TWO PEOPLE WITH SIMILAR BMI

**↓ Muscle mass → → ↓ Muscle Strength
→ → increased risk for falls**



Edith Murway-Traina - powerlifting at 100



Helen Kostadinov - powerlifting at 68



Les Savino uses 15 weight machine, does 45 reps each day at 100

Impact our Bones

Change in bone structure

Change in balance between bone resorption and formation



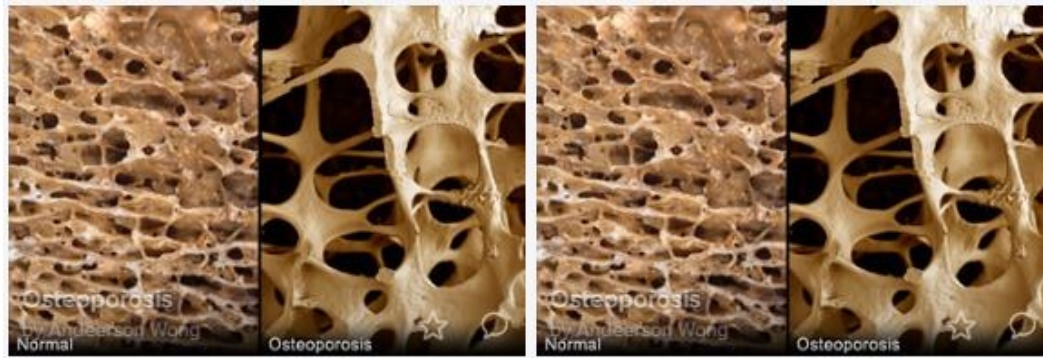
Loss of bone tissue



Low bone mass

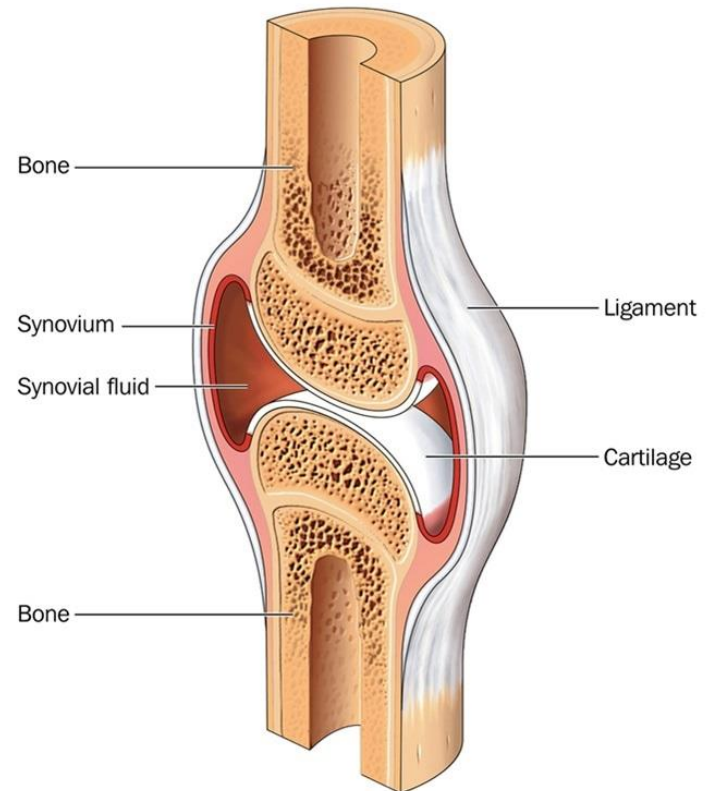


Weaker bones, higher risk of fracture



Impact our Joints

- Change can occur around age 35 and over
- Are more vulnerable to damages
- Joint surfaces aren't able to slide as smoothly over one another
- ↓ ability to repair tissues



Key Nutrients for Muscle and Bone Health



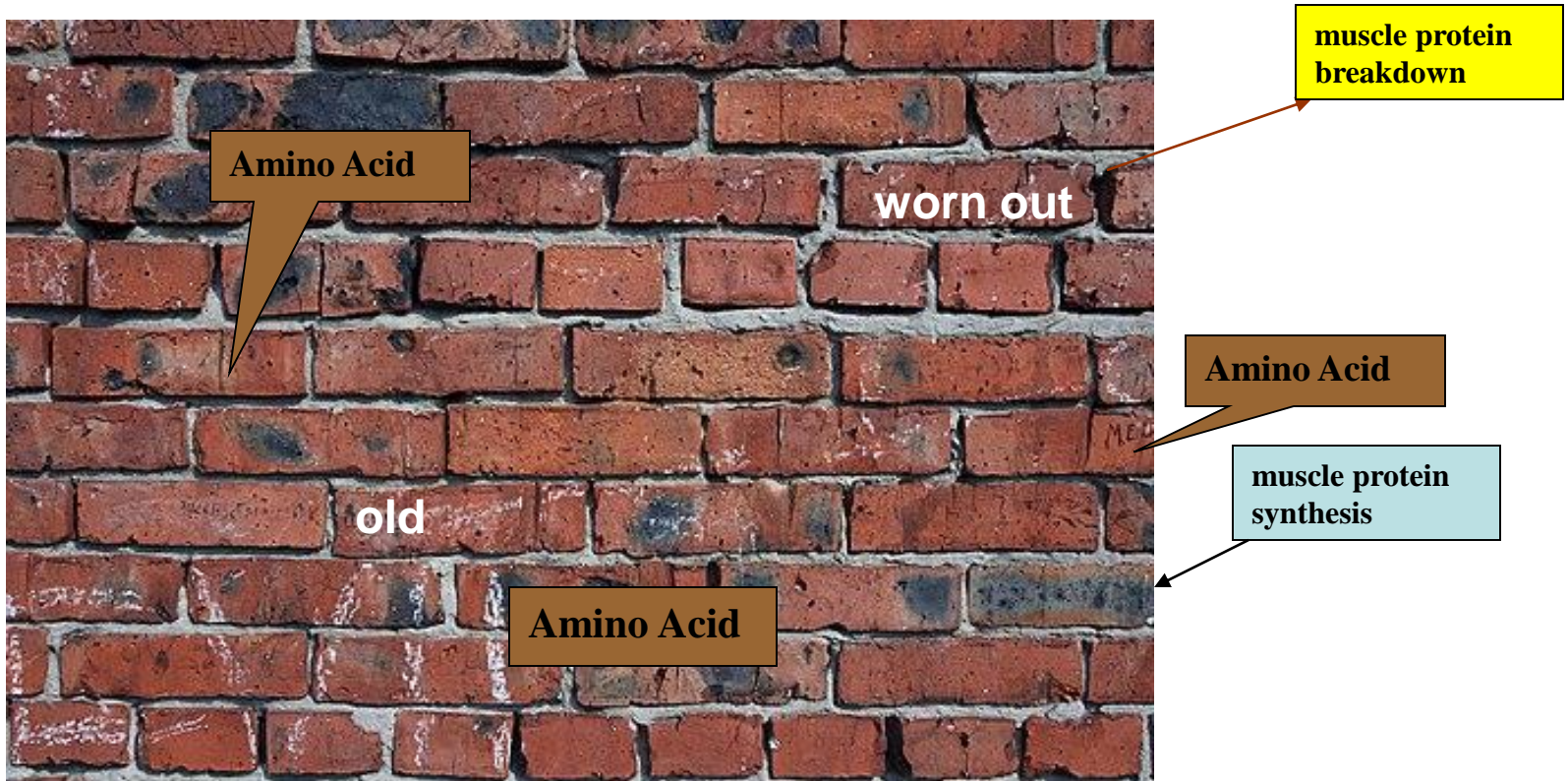
Other micronutrients in bone health include P, K, Mg, Vitamin K, Vitamin C, Zinc.

Dietary Protein

- A key nutrient for muscle and bone health
- Provides the amino acids to build and repair muscle
- Prevents muscle loss



Dietary Protein



**net muscle protein balance =
muscle protein synthesis – muscle protein breakdown.**

How Much Protein Do We Need?

Recommended Dietary Allowance (RDA)

0.8 grams/kg/day

e.g. 68kg (150 lbs) woman

needs 55 grams of protein per day

Protein consumption in Canadian habitual diets

Most Canadians met or exceeded protein **recommendations** except for **females** and the **elderly**.

In 2015, **2/3** of Canadian adults' **total protein intake** came from **animal foods**.

Sources were:



Red & processed meat

22%



Poultry and eggs

20%



Cereals, grains & breads

20%



Dairy

17%



Nuts, seeds & legumes

5%



Vegetables & fruit

5%



Fish & shellfish

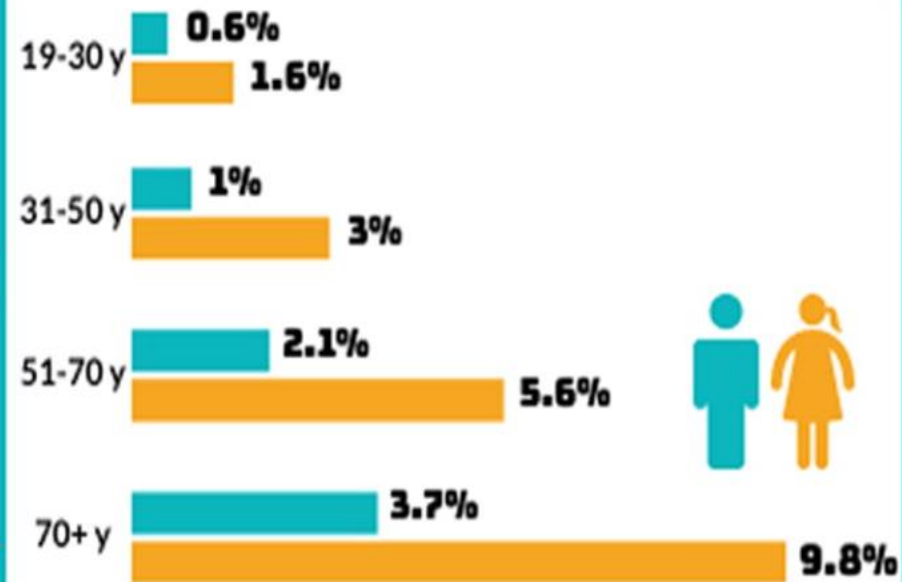
5%



Miscellaneous

6%

Percent below recommendations:



Anclair & Burgos. 2020. Protein consumption in Canadian habitual diets: usual intakes, inadequacy, and the contribution of animal- and plant-based foods to nutrient intakes. APNM.

Applied Physiology, Nutrition, and Metabolism

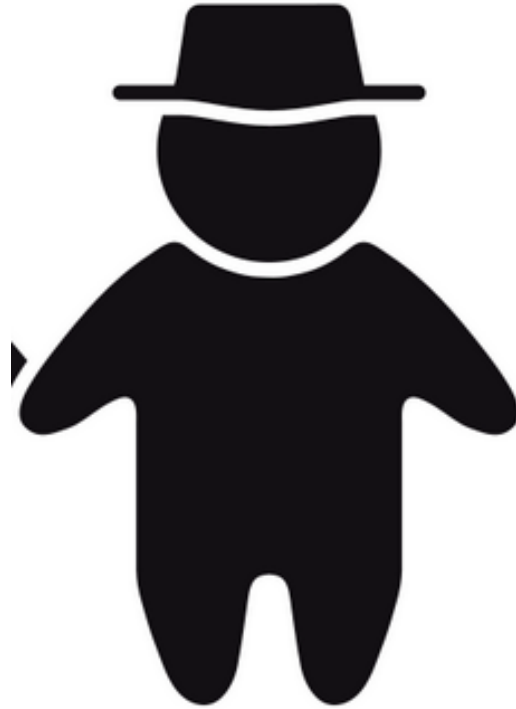
[Volume 46, Number 5, May 2021](#)

Protein consumption in Canadian habitual diets: usual intake, inadequacy, and the contribution of animal- and plant-based foods to nutrient intakes

How Much Protein Do We Need?

	Source	Recommended grams of protein per kilogram body weight
Age 18 and older	RDA	0.8
Age 65 and older	Expert Opinion/ Research	1.0 – 1.2 ^{1 & 2}

How Much Protein Does He Need?



75kg (165 lbs)
75g to 90g of protein daily

Sarcopenia



Sources of Protein

- Dairy products such as cheese, milk and yogurt
- Eggs
- Fish and seafood
- Legumes such as beans, dried peas, lentils, soybeans
- Meat such as beef, lamb, pork, veal
- Nuts and seeds
- Poultry like chicken and turkey



Protein Quality

- Choose healthier protein sources
- Choose plant-based protein more often ⁵
- A vegetarian diet can meet dietary protein requirements ⁷



Examples of Plant-Based Protein



7.5G PRO
(1/4 CUP)

PEANUTS

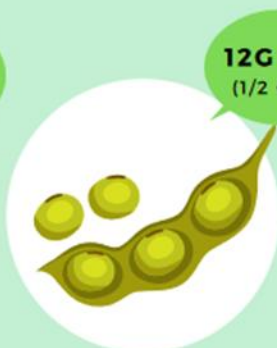
- 📌 Enjoy a handful for a snack



9G PRO
(1/2 CUP)

LENTILS

- 📌 Mix into pasta sauce



12G PRO
(1/2 CUP)

EDAMAME

- 📌 Give beef chili a boost



12G PRO
(3/4 CUP)

TOFU

- 📌 Scramble in a pan with spices



8G PRO
(1/2 CUP)

BLACK BEANS

- 📌 Create a flavourful bean dip



4.5G PRO
(1/4 CUP)

WALNUTS

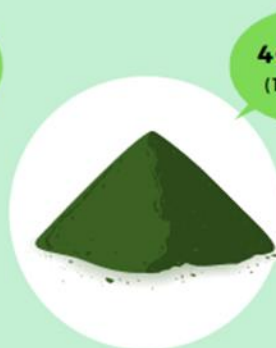
- 📌 Toss on a leafy green salad



4G PRO
(2 TBSP)

CHIA SEEDS

- 📌 Sprinkle over oatmeal



4G PRO
(1 TBSP)

SPIRULINA

- 📌 Blend in a smoothie



4G PRO
(1/2 CUP)

QUINOA

- 📌 Add to soups and stews

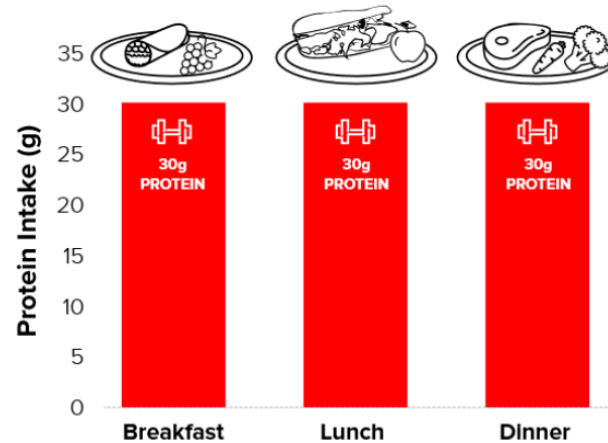


6G PRO
(1/2 CUP)

OATS

- 📌 Mix in with yogurt

Spread Your Protein Intake



- Beneficial for muscle mass growth and retention
- **25** to **30** grams of protein at each meal^{3 & 10}
- Protein before bedtime – may help preserve muscle mass¹¹

30g-protein Meal Ideas

BREAKFAST



Amaranth,
Cooked
(125mL)
5g protein



Sesame Seeds,
Toasted
(30mL)
3g protein



Cottage Cheese, 1%
(125mL)
12g protein



Skim Milk
(250mL)
9g protein



Coffee/Tea
(175mL)



Apple
(1)
1g protein

LUNCH



Kefir
(250mL)
8g protein



Canned Salmon
(125mL)
16g protein



Whole Wheat
Tortilla (1)
4g protein



Bell Pepper, Sliced
(125mL)
2g protein



Water
(250 mL)

SUPPER



Braised Pork Chops
(74g)
22g protein



Quinoa
(125mL)
4g protein



Green Beans
(125mL)
2g protein



Carrots
(125mL)
2g protein



Water
(250mL)

Vitamin D

- A fat-soluble vitamin
- A “sunshine vitamin”, a hormone
- Helps absorb calcium
- Supports strong bones and muscles
- Important for nerve and immune functions



Low Levels of Vitamin D

- Rickets in children
- Osteomalacia in adults
- Osteoporosis
- Increased risk of falls and fractures



Vitamin D Recommendations

- Amount needed depends on your age

Health Canada

- Normal, healthy adults - **600** international units (IUs) per day up to age 70
- **800 IU/d** after age 70

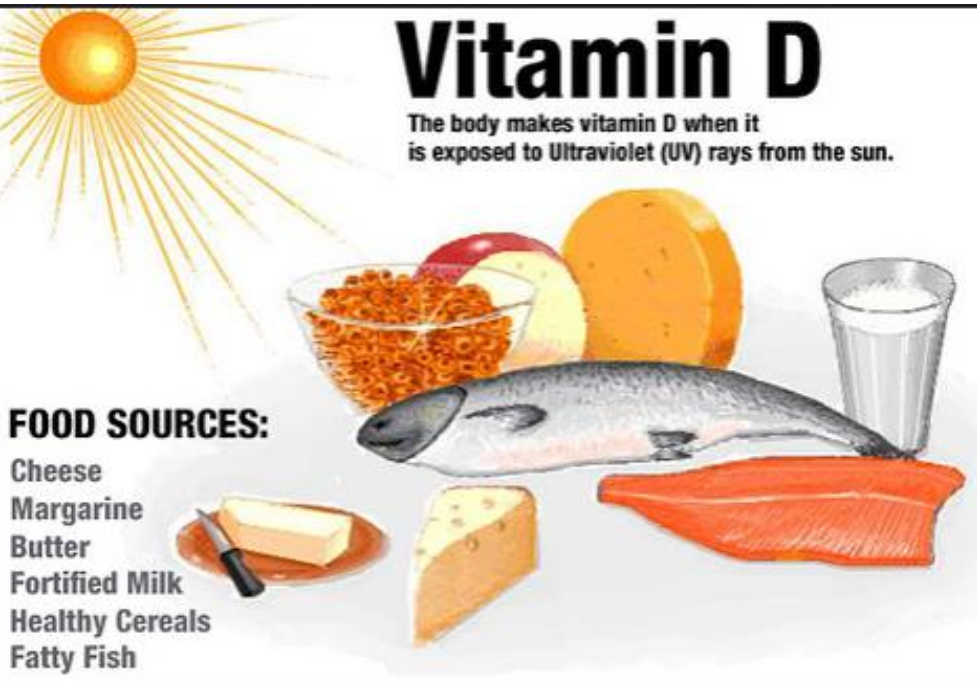
•Osteoporosis Canada

Adults at risk of osteoporosis⁹

50+ y: **800 to 2,000 IU/d**

Sources of Vitamin D

- Sun exposure
- Diet
- Supplements



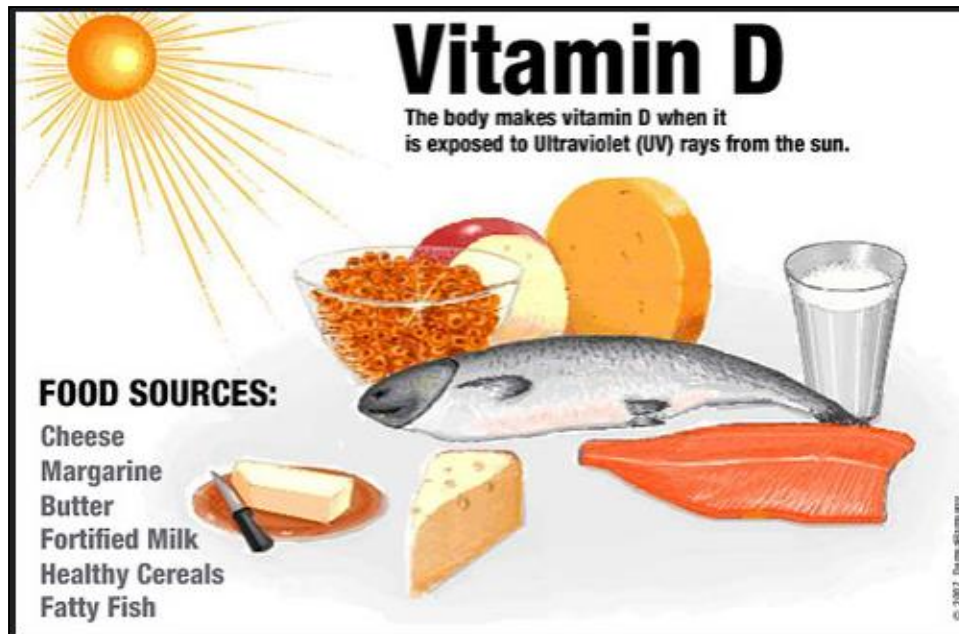
Sun Exposure

- Best source
- 5 – 15 minutes around midday, several times a week⁶



Dietary Sources of Vitamin D

- Fatty fish, fish liver oil, beef/pork liver, egg yolks
- Vitamin D fortified food and beverages



Vitamin D Supplementation

- Take **400 international units (10 ug)** daily if you are over 50
- Elderly living in institution should take a vitamin D supplement daily
- Available in D2 and D3



Calcium

- The most abundant mineral in our body
- Essential for building and maintaining healthy bones
- Helps the heart, nerves, muscles, and other body systems work properly
- Calcium comes from food we eat



Calcium Deficiency

- Bones act as a calcium bank
- If calcium is lacking, the body will take it from the bones
- Overtime → decreased bone density →
- increased risk of osteoporosis



How Much Calcium Do I Need?

- Institute of Medicine - **600** to **1300 mg** based on age and gender
- Osteoporosis of Canada
 - Adults between 19-50 years of age - **1,000 mg** daily
 - Adults over 50 years of age - **1,200 mg** daily

Sources of Calcium

- Milk and Milk Products

High-calcium Foods

- Kale, broccoli, Chinese cabbage (nappa), bok choy, and other green leafy vegetables
- Sardines, salmon, and other soft-bone fish
- Calcium-fortified tofu
- Breads, pastas, and grains
- Calcium-fortified cereals, juices, and other beverages



Calcium Supplements

Two Main Types:

Calcium Carbonate:

- The least expensive and requires the fewest tablets.
- May cause constipation and bloating.
- Must be taken with meals for adequate absorption.

Calcium Citrate:

- More expensive than calcium carbonate.
- Requires more tablets to get the desired dose.
- Absorption not dependent on gastric acid.
- Less likely to cause gastrointestinal side effects.



Calcium Supplements

- If taking iron and calcium supplements, do not take them at the same time
- For optimal absorption, do not take more than 500 mg per dose
- If taking >500 mg/day, the dose should be divided



Tips for Joint Health

- Prevent weight gain with age and maintaining lean body muscle is key
- Consume a diet high in vegetables and fruits, whole grains, lean protein, low fat dairy



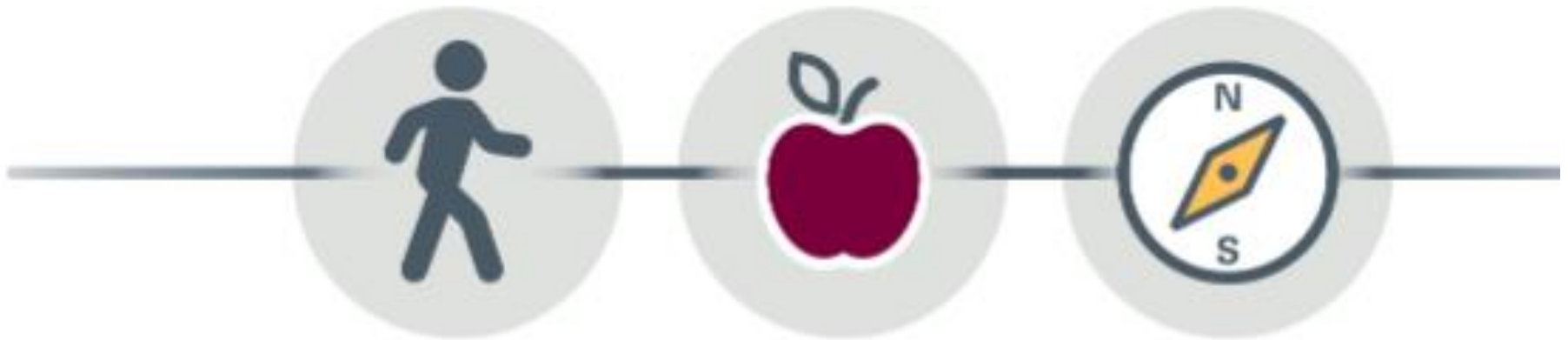
Vitamin C

- Vitamin C – helps body to produce collagens; an antioxidant, protects cells from free-radical damage, helps prevent infection and control inflammation
- Good sources of vitamin C - citrus fruits, tomatoes, potatoes, broccoli, strawberries, and sweet peppers



Conclusion

- Eat well
- Get enough protein, vitamin D, calcium, & vitamin C
- Keep moving
- Prevent accumulation of excess body weight
- Get adequate sun exposure



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