The Bare Bones of OSTEOPOROSIS

How do our bones age?

There are two main types of cells that affect our bone mass:

- **Osteoblasts** lay down new bone
- **Osteoclasts** break down old bone

These cells work in harmony to constantly service our bones, turning over old bone and replacing it with new material. As young adults, our bones grow bigger and stronger. By around age 35, we hit our "**peak bone mass**". From there, the balance tends to shift towards bone breakdown at a slow and steady rate. After menopause, women lose the protective effects of estrogen on bones and the rate of bone breakdown rapidly increases - putting these women at greater risk for osteoporosis.

What is Osteoporosis?

As we age and bone breakdown surpasses bone creation, our bones become more porous and weak. Osteoporosis is defined as **low bone density** (less than 2.5 standard deviations below the mean). This is determined by dual-energy x-ray absorptiometry (DEXA scan), a test that allows doctors to compare your bone density to that of a healthy young adult with peak bone mass.

Why is it such a big deal?

Osteoporosis puts us at risk for fragility fractures. These occur when minor falls result in fractures. Examples would be breaking a bone after:

- Falling from standing height or less (e.g. tripping and falling or rolling out of bed)
- Falling down just a few stairs (e.g. missing 1-3 steps)

The most common osteoporotic fractures are vertebral compression fractures.

- You may notice a decrease in your height or severe pain in your back

Am I at risk?

Certain things put us at a higher risk for developing osteoporosis. Some risk factors include:

- Age over 65
- Early menopause
- Parental hip fracture
- Current smoking
- Previous fragility fracture, vertebral fracture, or osteopenia
- Prolonged glucocorticoid or other high-risk medication use
- High alcohol intake (3 or more units per day)
- Rheumatoid arthritis
- Low body weight (less than 60kg) or major weight loss (more than 10% loss since age 25)
- Chronic malabsorption (e.g. Celiac disease, Crohn's, Ulcerative Colitis)

Ask your physician about whether you are low, moderate, or high risk!

- Risk zones help guide conversations between you and your physician about treatment options
- Risk zones are determined using the FRAX or CAROC scoring systems
- These take into account your risk factors, whether or not you have other disorders that are associated with osteoporosis, and your bone mineral density results

What tests will I have done?

If your doctor is concerned about your bone health, they may order some tests for you. Your bloodwork may include tests looking at your calcium and vitamin D levels, your kidney function (some medications are metabolized by the kidneys), and even some tests looking for secondary causes of osteoporosis like hyperthyroidism. All men and women 65 years and older should have a DEXA scan to assess bone mineral density, however you doctor may ask you to get one earlier depending on your age and risk factors.

Are there medications I can take?

Depending on your 10 year fracture risk, your physician may recommend some medication to you. There are many different types of osteoporosis medications. A few common examples are:

- Bisphosphonates (e.g. Alendronate [Fosamax], Risedronate [Actonel])
  - Work by causing death of osteoclasts, the type of cell that is responsible for bone breakdown
  - Should not be taken in people with Chronic Kidney Disease (eGFR <30 to 35 ml/min), or certain esophageal disorders
  - Delivery: Oral tablets with varying frequency from daily to monthly or intravenous injection given once yearly
    - Take oral tablets with lots of water and remain upright for 30 mins
- RANK Ligand Inhibitors (e.g. Denosumab [Prolia])
  - Work by Inhibiting osteoclast production and activation, thus reducing bone breakdown
  - This medication is not excreted by kidneys and therefore is safe to use in patients with kidney disease
  - Delivery: Injection given every 6 months under the skin

Some other types of medications that are used include Hormone Replacement Therapy (used in women also experiencing menopausal symptoms), Parathyroid Hormone and Selective Estrogen Receptor Modulators. Testosterone therapy is not recommended in men.

These medications may or may not be right for you and should be discussed with your care provider. Discuss potential side effects with your doctor to see what best suits you.

What lifestyle changes can I make?

SUPPLEMENTS

Calcium

Daily requirements:

- premenopausal women: 1000mg
- postmenopausal women: at least 1200mg

If insufficient calcium from diet, take supplements

Vitamin D

Typical daily requirements:

- Over age 50: 800-2000 IU
- Under age 50: 400-1000 IU

You may require more depending on your blood test results

EXERCISE

Strength Training

At least twice per week

- Keeps your muscles and bones strong

Posture and Balance

Exercise Daily

- Prevents falls, keeps you steady on your feet and standing upright

Weight Bearing Aerobics

Min 150 mins per week

- Good for overall health and may improve bone strength

HABITS

Smoking Cessation

Smoking decreases bone density and contributes to osteoporosis

Reduce Alcohol Intake

Reduce alcoholic beverages to less than 3 units per day

Diet

Eat a healthy well balanced diet rich in calcium. Calcium is best when received from our diets (e.g. dairy and leafy greens). If dietary restrictions or insufficient intake from diet, take calcium supplements.

FIND EXERCISE TIPS FROM OSTEOPOROSIS CANADA: TOO FIT TO FRACTURE

SOURCES: WWW.OSTEOPOROSIS.CA
THE COLLEGE OF FAMILY PHYSICIANS OF CANADA: OSTEOPOROSIS

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