Osteoporosis in Primary Care

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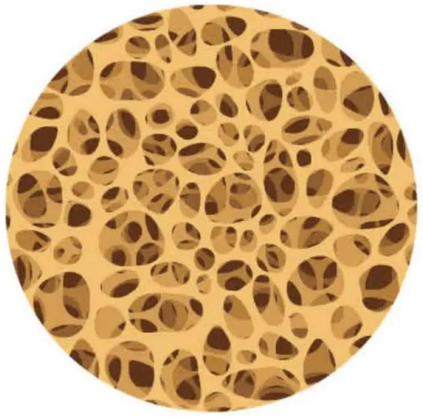
Objectives

- Definition and Pathophysiology
- Risk Factors
- Diagnosis
- Screening
- Treatment Options
- Prevention

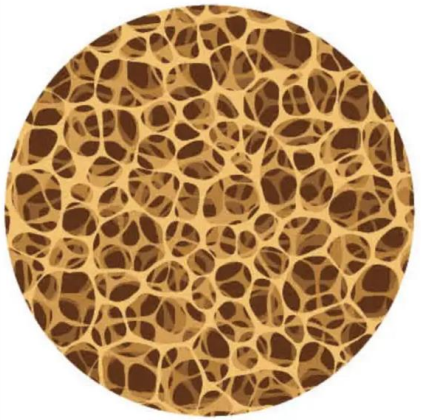
Definition & Pathophysiology

- Osteoporosis is low bone mass, micro architectural disruption, and skeletal fragility resulting in decreased bone strength and increased risk of fracture

- Result of prolonged imbalance of bone remodeling
  - Normally, the activity of osteoclasts (bone resorption) are balanced by that of osteoblasts (bone formation)
  - Bone mass typically peaks in early 30s
  - With ageing bone mass gradually decreases



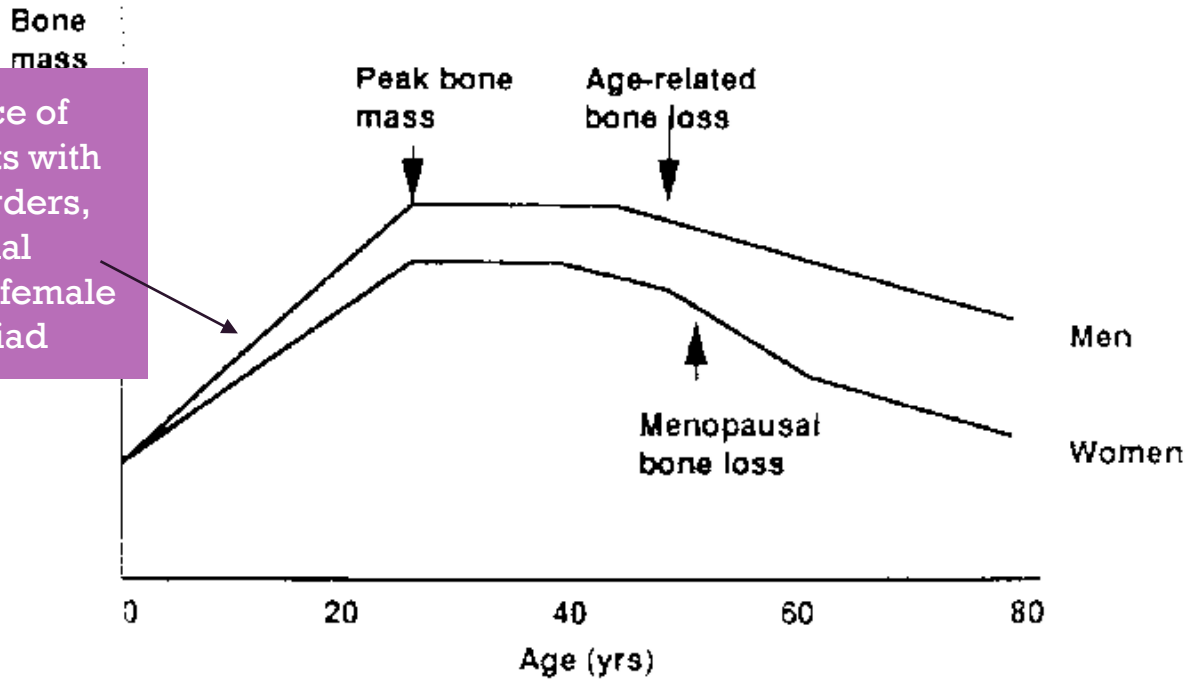
NORMAL BONE DENSITY



OSTEOPOROSIS

Bone Remodeling Time Course

Importance of screening pts with eating disorders, nutritional deficiencies, female athlete triad



- Hormones that contribute to decrease BMD with aging
  - **Calcitonin** inhibits bone resorption and promote bone formation (decreases)
  - **Estrogen** inhibits bone breakdown (decreases)
  - **PTH** increase bone turnover and resorption (increases)

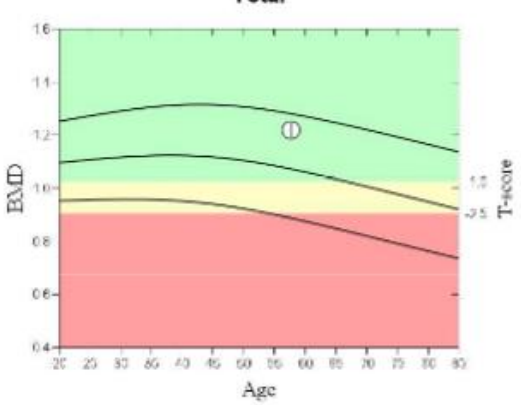
Risk Factors

- **Advanced age**
- **Previous fracture**
- **Parental history of hip fracture**
- **Smoking, alcohol consumption**
- **Glucocorticoid therapy**
- **Low BMI (less than 58 kg [127 lb])**
- **White**
- Inflammatory disease: Ex: diabetes, RA, Crohns
- Malabsorptive disease: ex. Celiac's, Crohns
- Medications: PPIs, SSRIs, anticoagulants

Diagnosis

- **DEXA**
  - Osteopenia / Low Bone Density: T score -1 - -2.5
  - Osteoporosis: T score < – 2.5
- **Fragility Fracture**
  - Minimal Trauma = ground level, walking speed
  - **Vertebral**
    - most common, 2/3 are asx
    - >2cm loss of height predictive of vertebral compression fx
  - Hip
    - Highest risk of mortality
  - Wrist
  - Humerus

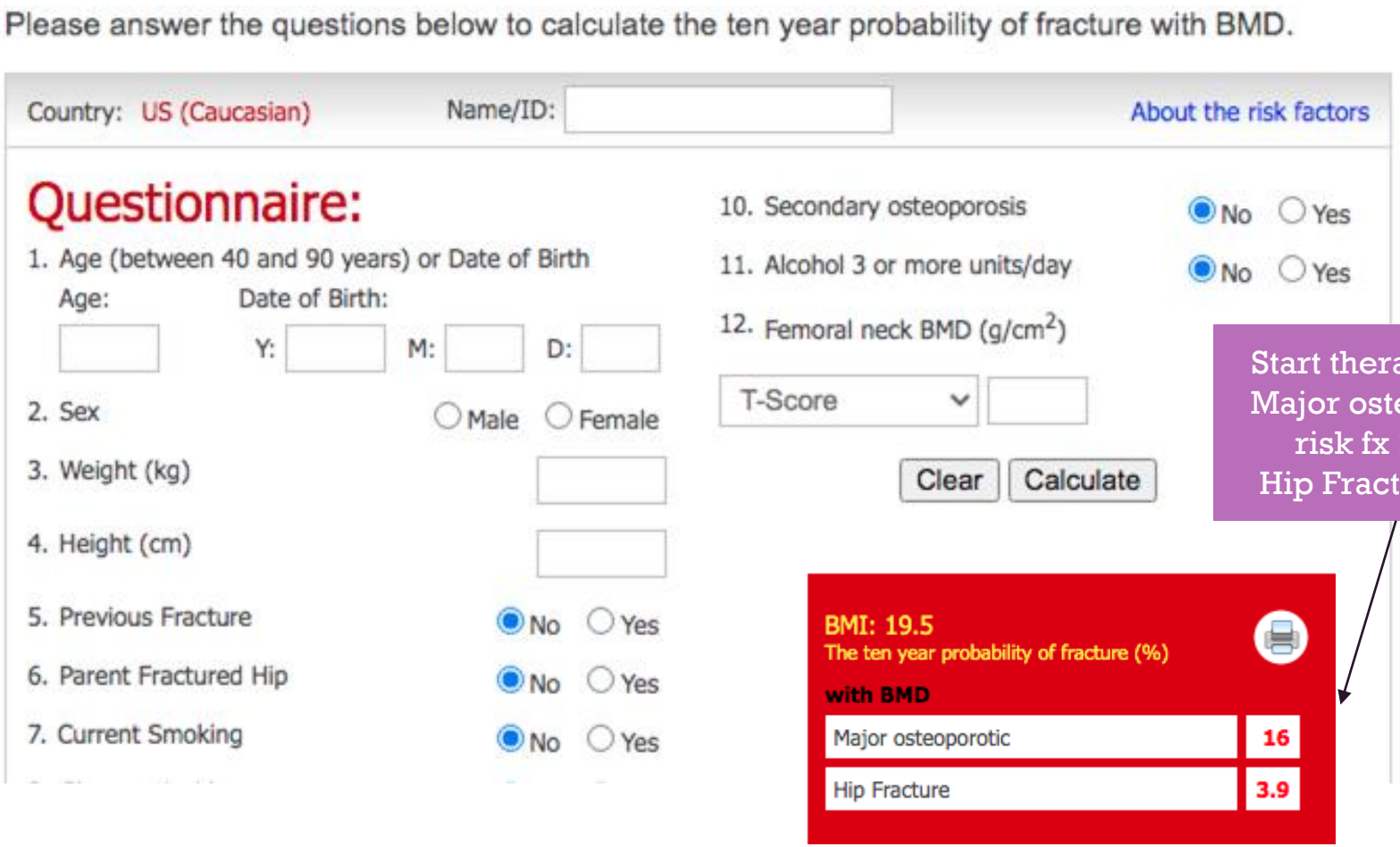
Reading a DEXA report



Region	BMD	T score	Z score
Lumbar Spine	0.860	-1.6	0.4
Femoral Neck	1.241	-2.5	-0.8
Total Hip	1.072	-1.0	0.3

- **T- score:** comparing to healthy young adult population (peak bone mass)
  - post-menopausal women, men >50
- **Z-score:** comparing to age and gender matched population
  - Premenopausal women, men <50, children

FRAX – Fracture Risk Assessment Tool



Start therapy when Major osteoporotic risk fx > 20%
Hip Fracture >3%

Screening

- **USPSTF**
  - All women age 65+
  - Postmenopausal women with clinical risk factors for fracture
- **Repeat DXA measurement**
  - Low bone mass: repeat every 2 years if risk factors present
  - Low bone mass w/o risk factors: repeat every 3 - 5 years
  - Normal bone mass w/o risk factors: repeat every 5 years
- **Screening BMD in men is controversial**
  - NOF recommend screening all men >70 or men age 50-70 with fracture risk
- **Importance of risk assessment*
  - *the majority of fractures occur in individuals with low bone mass, not osteoporosis, because there are so many more patients in this category.*

Treatment

CLINICAL GUIDELINE

ACP American College of Physicians®
Leading Internal Medicine, Improving Lives

Treatment of Low Bone Density or Osteoporosis to Prevent Fractures in Men and Women: A Clinical Practice Guideline Update From the American College of Physicians

Amir Qaseem, MD, PhD, MHA; Mary Ann Forciea, MD; Robert M. McLean, MD; and Thomas D. Denberg, MD, PhD; for the Clinical Guidelines Committee of the American College of Physicians*

- When to start treatment?
  - All patients diagnosed with osteoporosis
    - DXA T score < - 2.5
    - Hx of fragility fracture
  - Low Bone mass (T score between -1.0 and 2.5) and FRAX 10 year risk >20% or 10 year risk of hip Fx >3%

Treatment

- **First line therapies**
  - Clinically proven to reduce risk of BOTH vertebral and hip fracture
  - Bisphosphonates
  - Denosumab
    - Both anti-resorptive agent
- **Other Therapies**
  - PTH analogs
  - SERMs

Bisphosphonates

- 3 oral bisphosphonates
  - **Alendronate (Fosamax)**
    - 70 mg qweekly or 10mg qdaily
  - **Risedronate (Actonel)**
    - 150 mg qmonthly or 35mg once weekly or 5 mg once daily
  - **Ibandronate (Boniva)**
    - 150 mg qmonthly
  - Treat for **5 years**

- IV Zoledronic Acid (Reclast) qannually x 3 years
  - requires Endo/Osteo clinic referral

Bisphosphonates

- **Before prescribing**
  - Check Vitamin D and Calcium, replete before starting
- **Contraindications**
  - Esophageal disorders
  - CKD (GFR <30L/min)
- **Instructions**
  - Take first in morning, only with water
  - avoid food for 30-60 minutes
  - Sit/Stand Upright >30mins
- **Side effects**
  - GI intolerance
  - Atypical femur fracture
  - Osteonecrosis of jaw
    - rare btw 1 in 10,000 to 1 in 100

Duration dependent, stop bisphosphonates after 5 years

Other Agents

- **Denosumab (Prolia)**
  - First Line agent
  - Prolia 60 mg SQ q6 months
    - Typically also requires referral to Endo/Osteo clinic
  - Increased fracture risk after stopping

- **PTH Analogs**
  - Bone forming and anti-resorptive
  - Teriparatide (Forteo) 20 mcg SQ daily) for 2 years
  - Abaloparatide (Tymlos) 80 mcg SQ daily for 18 months

- **SERMs**
  - Raloxifene - only for patients with increased risk of breast cancer

Bone Holiday

- Oral bisphosphonates treat for 5 years with oral, 3 years with IV reclast
- After 3-5 years, we start "**bone holiday**" to decrease risk of atypical femur fracture and osteonecrosis of jaw
- **Every 2 years recheck DEXA or bone turnover labs**
  - serum bone specific Alkaline phosphatase and urine N-telopeptide
- If significant decrease in BMD, or increase in bone turnover labs, can transition to Prolia or other agent

Vitamin D and Calcium

- **Calcium: 1200mg of calcium/day**
  - 3 servings
    - 1 cup of milk
    - 3/4 cup of yogurt
    - Calcium fortified milk (almond, soy milk
    - dark greens: broccoli, bok choy, spinach
- **Vitamin D: 800iu - 1000iu/day**
  - Fatty fish
  - Egg
  - Mushrooms
  - Vitamin D fortified cereal, milk

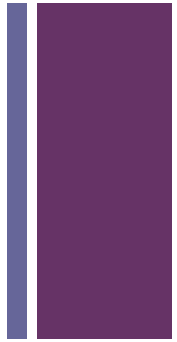
Strontium

- a metal that concentrates in bones
- approved in Europe for osteoporosis but not in North America
- shown to increase BMD but **NOT shown to reduce risk of fractures**

Weight Bearing and Resistance Exercises

- **Weight Bearing Exercises**
  - Dancing
  - walking/jogging
  - jumping rope
  - hiking
  - climbing stairs
- **Muscle Strengthening Exercises**
  - Weight lifting
  - using elastic bands
  - lifting own body weight

Questions?



Resources

- https://ucla.medhub.com/files/curriculum/curriculum_fm_osteoporosisguideline%5B2%5D.pdf
- https://www.uptodate.com/contents/screening-for-osteoporosis-in-postmenopausal-women-and-men?search=risk%20factor%20independent%20of%20bmd&source=search_result&selectedTitle=2~150&usage_type=default&display_rank=2
- https://www.nof.org/patients/treatment/exercisesafe-movement/osteoporosis-exercise-for-strong-bones/