Objectives:
1. Review incidence & Risk of Osteoporosis
2. Review indications for testing
3. Review current pharmacologic & Non pharmacologic Tx options
4. Understand & Utilize FRAX score
Bone Density increases until age 25-30 years

Decreases 2-4% / yr for next 5-7 yrs
Then 1% / yr
BMD - measurement of bone density

DEXA – Dual Energy Xray Absorptiometry
  Peripheral DEXA – ie finger, wrist
Ultrasound of heel
Quantitative CT scan

Central DEXA is gold standard
Osteoporosis Defined

2.5 standard deviations or more below mean peak BMD of young healthy adults

Reference: World Health Organization
INCIDENCE OF OSTEOPOROSIS

Asymptomatic until fracture (HTN, CAD, CA, etc)

Number of OP fractures > Number of AMI, CVA, Breast CA combined

Lifetime risk for hip fractures in women > Incidence of CVA, DM2

Ref: National Osteoporosis Foundation
INCIDENCE OF OSTEOPENIA

Lifetime risk for hip fracture > Risk for Breast CA, Endometrial CA and Ovarian CA combined

Men: lifetime risk for hip fracture > Clinically significant Prostate CA

Approximately 50% of hip fractures in 80+ year olds are in MEN!
RISK FACTORS

- AGE > 65 YRS (see FRAX score)
- MATERNAL HISTORY OF HIP FRACTURES (FRAX)
- FALLS
- CAUCASIAN and ASIAN RACES
- LOW VITAMIN D
RISK FACTORS

- STEROID USE (see FRAX score)
- LOW CALCIUM DIET
- LACK OF WT BEARING EXERCISE
- HYPERTHYROID, HYPER PARATHYROID
- OVERACTIVE ADRENAL GLANDS
LOW SEX HORMONES
- WOMEN: menopause, breast CA treatments
- MEN: Low Testosterone, prostate CA treatments

Good reason to measure and consider HRT or Hormone Optimization Therapy?
RISK FACTORS

- BARIATRIC or other GASTRIC SURGERIES
- CELIAC DISEASE
- INFLAM BOWEL DISEASE
- CKD
- RHEUMATOID ARTHRITIS (see FRAX score)
RISK FACTORS

• Tx is indicated if 10 year risk for hip fracture = 10% based on FRAX score
• 35% risk of OP fracture with more than 2 risk factors
Trademarked WHO-sanctioned Fracture Risk Assessment Tool

Can be used free at this site under the “Calculation Tool” tab – calculates % risk based on 12 risk factors
FRAX SCORE

- Will need patient’s: Age, Height, Weight and Femoral neck (or Total Hip) BMD
- Use if not sure should offer Tx or if patient is hesitant
  - Example: Hip T score -2.0 and no H/O recent fracture
WHO DO WE TREAT?

- HEDIS data (Healthcare Effectiveness Data & Information Set)

- Only 22% of high risk pts >67 y/o with recent fracture received DEXA test or Rx for OP

- Most fractures occur in pts WITHOUT a Dx of OP based on BMD testing
  - Do any of us work in a nursing home??
History of fracture increases risk for future fractures
Important to prevent the first fracture!!

HOW ??

20% increased mortality in 1\textsuperscript{st} year after fracture !
similar to risk of 2\textsuperscript{nd} MI in first year

REFER TO ??
PREVENT FIRST FRACUTRE

- HOME HEALTH AGENCY
  - PHYSICAL & OCCUPATIONAL THERAPY
    - F2F documentation; HCFA 485; 99__

- BALANCE THERAPY

- YOGA & TAI CHI
Calcium: 1,000 – 1,200 mg daily
Vitamin D: 600 – 4,000 IU daily

Protein: 1 gram / kg body weight / day
  - Elderly, Vegans, Vegetarians may be at risk of low intake

- 200 lb = 100 kg will need 100 gm protein DAILY
- Whey and Soy
TREAT ME !!

- EXERCISE
  - WEIGHT BEARING
  - 30 MINUTES 5 DAYS PER WEEK

- BALANCE EXERCISES -
  - TAI CHI, YOGA
MEDICATIONS

- ORAL BISPHOSPHONATES
  - BIPRODUCT OF DETERGENTS
  - POORLY ABSORBED
    - 50% OF PATIENTS DISREGARD INSTRUCTIONS
  - ABDOMINAL PAIN, GASTRITIS, GASTRIC ULCERS
  - OSTEONECROSIS OF JAW
  - INEXPENSIVE COMPARED TO OTHER CHOICES
MEDICATIONS

NON INTRAVENOUS

- PROLIA (Denosumab) – SC every 6 months
- FORTEO (Teriparatide) – SC daily - limit 2 yrs
- ESTROGEN REPLACEMENT – PO, Patch, Ring
- TESTOSTERONE REPLACEMENT – gels, creams, IM
- MIACALCIN (CALCITONIN) – intranasal daily

INTRAVENOUS

- RECLAST (zoledronic acid) – once per year
- BONIVA (ibandronate) – every 3 months
INCREASE IN BMD OF SPINE

- Miacalicin
- Evista (raloxifene)
- Bisphosphonates
- Reclast
- Prolia
- Forteo

- No significant increase
- 2% - 3% increase
- 5% - 6% increase
- 6.7% increase
- 8.8% increase
- 5% - 10% increase
Relative Risk Reduction for fracture

- 50% - 60% with all agents by 3 years
- EXCEPTIONS = BONIVA and EVISTA showed no trend toward decrease in hip fractures
A Few of My Favorites
RECLAST

- Once yearly - 100% compliance
- 15 – 20 minute infusion in your office
- Highest reported reduction in fractures
- Contraindicated if CrCl < 35ml/min
- Up to 25% with post-infusion flu-like symptoms
- ONJ – Osteonecrosis of Jaw extremely rare
- Ensure adequate Vit D and Calcium intake
- Prior authorization may be difficult
RECLAST

- Dose: 5 mg per year
- Cost: $120.00 - $150.00 / yr
- Compare to Fosamax (alendronate)
  - 70mg per week x 52 wks = 3,640 mg per year
  - Cost with $25 co pay/month = $300.00 / yr
  - Cost with $50 co pay/month = $600.00 / yr

Actonel (risedronate) 35mg / wk = 1,820 mg / yr
150mg / month = 1,800 mg / yr
PROLIA

- MONOCLONAL ANTIBODY
- RANKL inhibitor - decreases Osteoclast activity in both cortical and trabecular bone
- 68% DECREASE in vertebral fractures (similar to Reclast)
- 40% DECREASE in hip fractures (similar to Reclast)
- SC injection every 6 months in office
- Can cause hypocalcemia especially if CrCl < 30ml/min, myalgias/arthralgias
- Prior auth easier than Reclast
NOF
Summary Recommendations

- The Journal of Clinical Endocrinology & Metabolism
  July 2008 Vol. 93, No. 7 2463-2465

- WWW.NOFOrg requires membership for access to articles but has a lot of patient education material
TABLE 1. Summary of the main recommendations in the NOF Guide for men and postmenopausal women age 50 yr and older

Recommendations

1. Counsel on the risk of osteoporosis and related fractures.
2. Check for secondary causes.
3. Advise on adequate amounts of calcium (at least 1200 mg/d, including supplements if necessary) and vitamin D (800–000 IU/d of vitamin D for individuals at risk of insufficiency).
4. Recommend regular weight-bearing and muscle-strengthening exercise to reduce the risk of falls and fractures.
5. Advise avoidance of tobacco smoking and excessive alcohol intake.
6. In women age 65 and older and men age 70 and older, recommend BMD testing.
7. In postmenopausal women and men age 50–70, recommend BMD testing when you have concern based on their risk factor profile.
8. Recommend BMD testing to those who have suffered a fracture, to determine degree of disease severity.
9. Initiate treatment in those with hip or vertebral (clinical or morphometric) fractures.
10. Initiate therapy in those with BMD T-scores ≤−2.5 at the femoral neck, total hip, or spine by DXA, after appropriate evaluation.
11. Initiate treatment in postmenopausal women and in men age 50 and older with low bone mass (T-score −1 to −2.5, osteopenia) at the femoral neck, total hip, or spine if 10-yr hip fracture probability is ≥3% or 10-yr major osteoporosis-related fracture probability is ≥20% based on the U.S.-adapted WHO absolute fracture risk model (FRAX; www.shef.ac.uk/FRAX).
12. Current FDA-approved pharmacological options for osteoporosis prevention and/or treatment are bisphosphonates (alendronate, ibandronate, risedronate, and zoledronate), calcitonin, estrogens and/or hormone therapy, raloxifene, and PTH 1–34.
13. BMD testing performed in DXA centers using accepted quality assurance measures is appropriate for monitoring bone loss. For patients on pharmacotherapy, it is typically performed 2 yr after initiating therapy and every 2 yr thereafter; however, testing after 1 yr may be warranted in certain clinical situations.
1. Counsel on risk of Osteoporosis
2. Check for Secondary causes
3. Advise adequate Ca+ / Vit D intake
4. Exercise: weight-bearing and balance
5. Advise stop smoking, limit alcohol
6. DEXA: Women > 65; Men > 70
7. DEXA at younger age if increased risk
NOF SUMMARY RECOMMENDATIONS FOR MEN & WOMEN OVER 50 YRS OF AGE

- 8. DEXA after first fracture (wrist, ankle, ...)
- 9. Initiate Tx in those with hip or vertebral fracture
- 10. Tx if BMD < -2.5 hip or spine by DEXA
- 11. Tx in postmenopausal Women or in Men age 50-70
  - If BMD is -1 to -2.5 at hip or spine
  - Or if FRAX score is > 20%
LAST WORDS

- DEXA – Every TWO yrs to monitor Tx

- Consider drug holiday if BMD stabilizes after taking Bisphosphonates for several yrs.

- Repeat DEXA in 1-2 yrs and resume Tx if BMD decreasing