

OSTEOPOROSIS

Medical intervention

Prophylaxis ^[1] ^[3]

- Alendronate: 5 mg per day
- Zoledronic acid: 5 mg intravenously every two years
- Calcium: 1,000 to 1,200 mg per day
- Vitamin D: 800 to 1,000 IU per day
- Estrogen: 0.3 mg or 0.625 mg per day via pill or patch

Treatment

- As the daily dose of GCs is a determinant of fracture risk, it must be constantly reviewed by considering both the reduction of the dose to the minimally active and alternative administration such as intra-articular injections. ^[1]
- The risk of falling should be assessed in particular in elderly patients, patients with painful joints of the lower limbs and patients with massive doses of GCs. Physical activity or mobilisation should be considered, adapted to the underlying condition. ^[1]
- Attention to nutrition must be paid to prevent protein and calcium intake deficiencies. ^[1]



First: consider oral Bisphosphonates ^[1]

- Alendronate (oral 5 or 10 mg once daily, or 70 mg once weekly),
- Ibandronate 150mg per month
- risedronate (oral 5 mg daily or 35 mg one weekly)
- **Then consider IV bisphosphonates** ^[1]
- zoledronate (intravenous infusion 5 mg once yearly)
- Clacitonin: 50 to 100 IU per day intramuscularly or 200 IU per day intra-nasally ^{[2] [3]}
- calcium (1200 mg/d or 500 mg twice daily) ^{[2] [3]}
- Vitamin D analogs: alfacalcidol – calcitriol ^{[2] [3]}
- Estrogen agonist/antagonist (raloxifene): 60mg / day ^{[2] [3]}

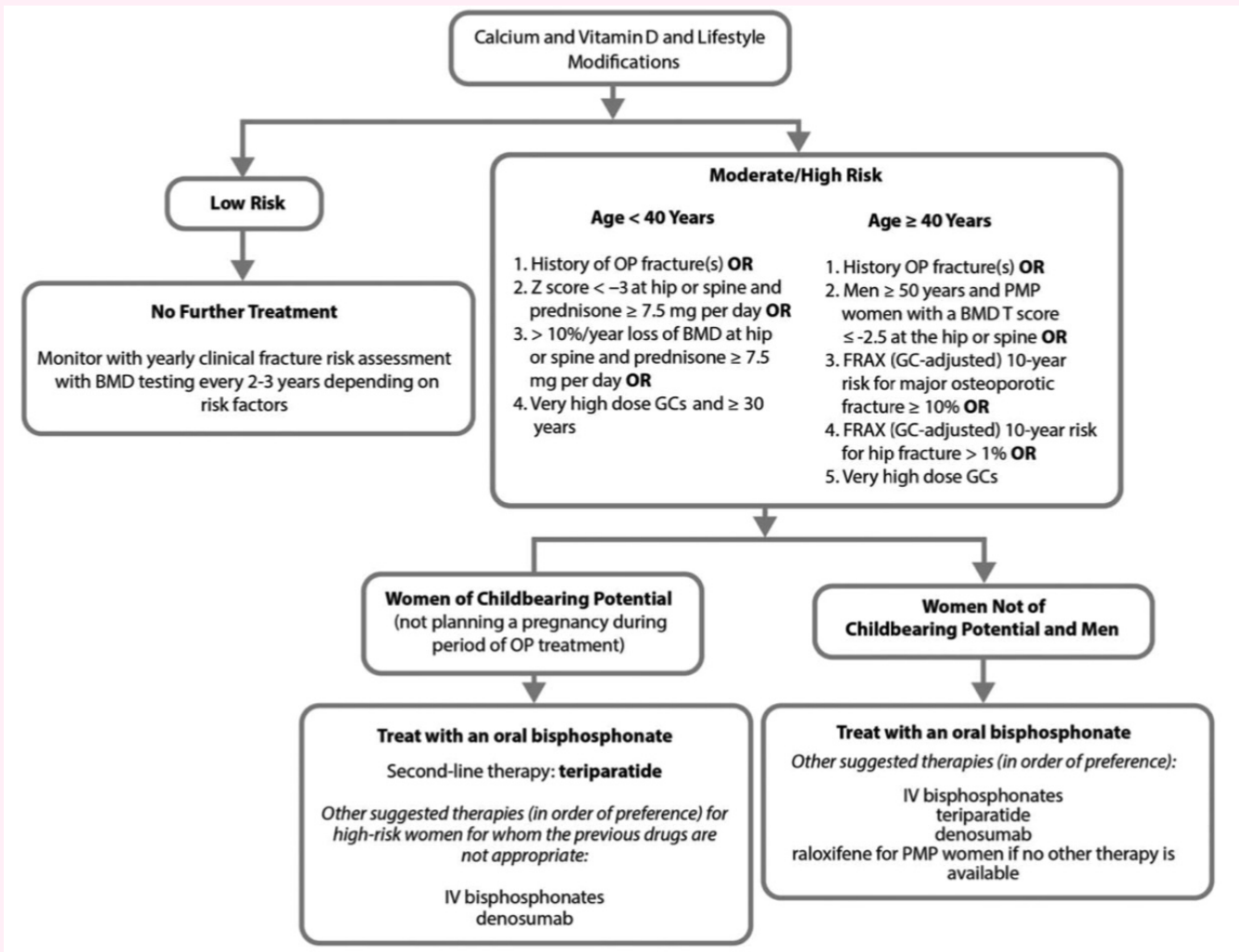
second line treatment or incase patient is intolerant to biphosphonates ^{[2] [3]}

- Parathyroid hormone (teriparatide): 20 mcg per day subcutaneously for up to 24 months
- RANKL inhibitor (denosumab): 60 mg per day subcutaneously every six months

Hormone replacement therapy

- Hormone replacement therapy and testosterone therapy have therefore been found to increase lumbar spine BMD in hypogonadal patients on glucocorticoid therapy ^[2]



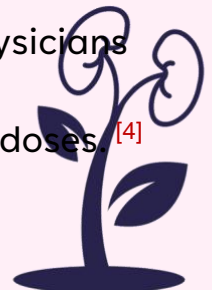


→ KTRs suffering from osteoporosis or at high potential risk should be considered for steroid- avoiding immunosuppression ^[2]

→ KTRs on long-term steroids or at high risk for osteoporosis should undergo DEXA scanning if eGFR >30 mL/min/1.73 m² ^[2]

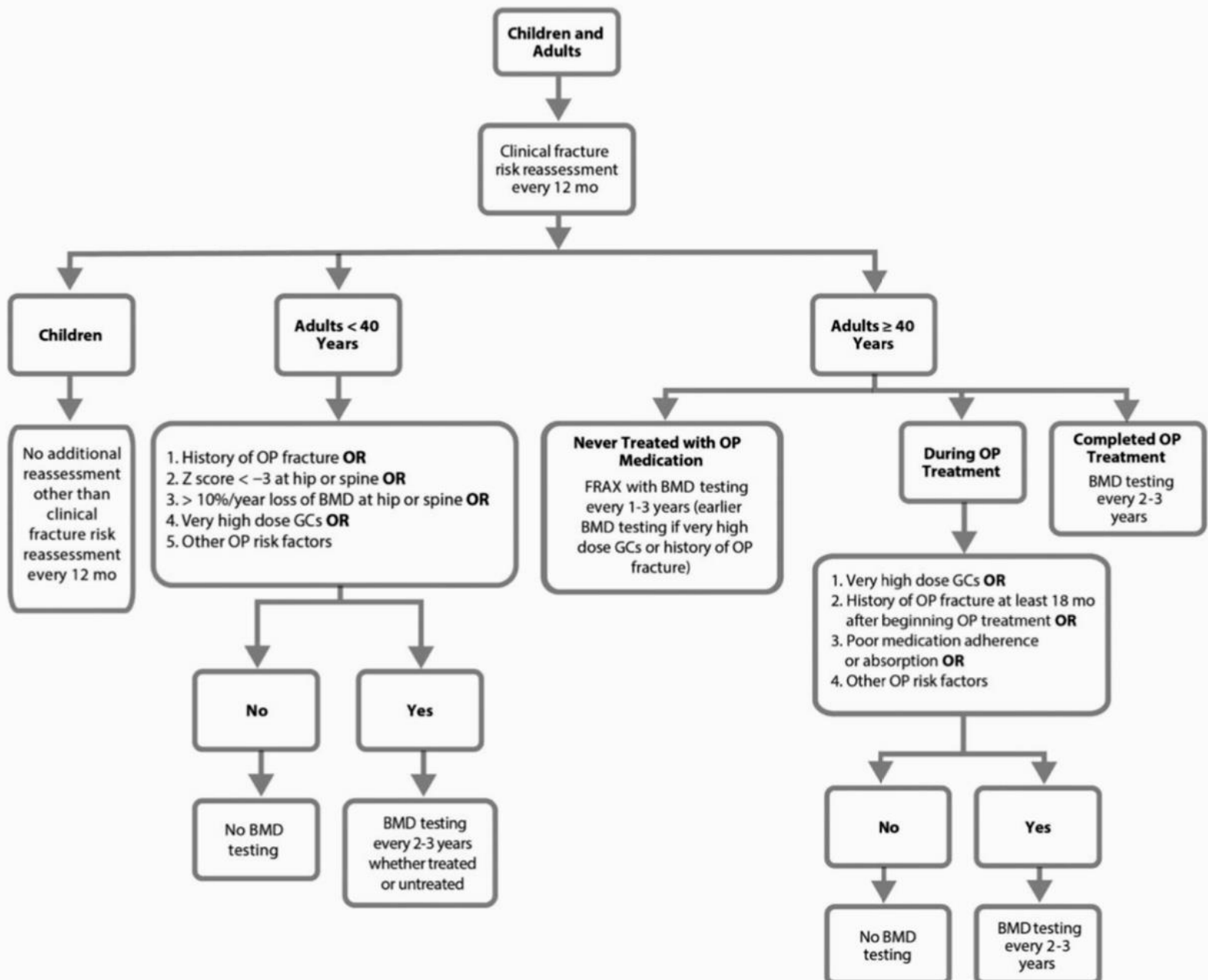
→ Treatment should be according to the Royal College of Physicians (RCP) guidelines for steroid-induced osteoporosis ^{[2] [6]}

→ Some consider alternate-day dosing method or use lower doses ^[4]



Assess risk of fall Measure

- BMD and fracture risk using diagram
- below Consider lifestyle changes by increasing exercise levels, and avoiding alcohol and smoking during treatment^[5]



Abbreviations: GIOP: Glucocorticoid-induced osteoporosis, KTR: kidney transplant recipients, BMD: Bone mineral density

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 - [3]- McCarthy J, Davis A. Diagnosis and Management of Vertebral Compression Fractures. Am Fam Physician. 2016 Jul 1;94(1):44-50. PMID: 27386723.
 - [4]- McDonald FD, Horensten ML, Mayor GB, Turcotte JG, Selezinka W, Schork MA. Effect of alternate-day steroids on renal transplant function. A controlled study. Nephron. 1976;17(6):415-29. doi: 10.1159/000180750. PMID: 796739.
 - [5]- Baker, R., Mark, P., Patel, R., Stevens, K., & Palmer, N. (2017). Renal association clinical practice guideline in post-operative care in the kidney transplant recipient. BMC Nephrology, 18(1). doi: 10.1186/s12882-017-0553-2
 - [6]- Buckley, L., Guyatt, G., Fink, H., Cannon, M., Grossman, J., & Hansen, K. et al. (2017). 2017 American College of Rheumatology Guideline for the Prevention and Treatment of Glucocorticoid-Induced Osteoporosis. Arthritis & Rheumatology, 69(8), 1521-1537. doi: 10.1002/art.40137

