

Executive Summary:

1. Diagnosis of osteoporosis can be made in a patient with minimal trauma fracture on clinical grounds alone without the aid of any other diagnostic tools.
2. Bone mineral density (BMD) measured by dual-energy X-ray absorptiometry (DXA) remains the modality of choice for diagnosis of low bone mass. Clinical Risk Assessment tools such as SCORE, OSTA and others are useful in selecting patients who would most benefit from measurement of BMD by DXA. Ultrasound and X-Ray based tools for measurement of bone mass or strength are useful but use of these tools for making treatment decisions is not established. Trabecular bone score (TBS) calculated along with DXA may provide additional complimentary information on bone quality/architecture.
3. Although normative data on BMD measured by DXA in healthy Indian adults at present, there is insufficient data to assess the fracture risk using the Indian BMD reference database. **Hence, for all practical purposes and in line with the 2019 ISCD Official Position, the Caucasian female database derived from the NHANES III is used as India's reference population for calculating T-scores**
4. Data indicate that **osteoporotic fractures occur at an earlier age in Indians** than in the West; hence, screening for osteoporosis should begin at an earlier age. BMD is recommended in women aged 60 and older and men aged 65 and older, regardless of clinical risk factors. Postmenopausal women younger than 60 years and men aged 60–64 years when there are concerns for osteoporosis based on their clinical risk factor profile
5. **FRAX** has been used extensively for fracture risk estimation in many parts of the world and is most validated for European population and in the USA. The tool offers a calculation of fracture risk for the Indian population. However, the calculation of fracture risk, reference is the expatriates living in Singapore. In practice, the calculations have shown to underestimate the risk of future fractures in our population and still needs validation.
6. All patients with low bone mass should receive **adequate calcium intake** (total calcium intake of 1000 mg daily) and optimum **serum 25-hydroxyvitamin D levels (>30 ng/mL)** should be maintained. In most cases, this would require regular calcium and vitamin D supplementation.
7. **Pharmacotherapy** should be guided by the presence/absence of vertebral/hip fractures or the severity of risk based on clinical factors. Bisphosphonates (oral alendronate or intravenous zoledronic acid) remain the first choice in most cases. In patient with more severe spine osteoporosis, teriparatide may be drug of choice. Denosumab is an effective and potent therapy; however, there is risk of rebound fractures after discontinuation of this therapy and treatment with this agent may need to be given for an indefinite period of time. Regular follow-up is essential to ensure adherence and response to therapy.
8. **Sequential Therapy.** If teriparatide is used as the initial therapy as an anabolic agent, this treatment should be followed with an anti-resorptive agent such as zoledronic acid in order to lock in the BMD gains.

9. **Drug Holiday.** Long-term (>3 to 5 years) treatment with bisphosphonates and denosumab has been associated with osteonecrosis of the jaw and atypical femur fractures. Since bisphosphonates become a part of the hydroxyl-apatite structure of bone, their beneficial effects last long after discontinuation of these agents, therefore drug holidays for 1 to 3 years can be considered receiving bisphosphonates. In case of denosumab, treatment may need to be continued indefinitely or followed by intravenous zoledronic acid.

10. **Follow up.** Follow up should occur more frequently early and in treatment to assure compliance. Long term, renal function (annually) and bone density (every 2 years) should be monitored. Bone markers can be used to assure compliance and response to therapy as the changes in bone markers occur sooner than changes in BMD.