Consider assessing fracture risk:

- In women aged ≥65 years and men aged ≥75 years
- In women <65 years and men <75 years in the presence of risk factors, for example:
  - Long term use (>3 weeks) or frequent use (3-4 course per year) of oral or systemic glucocorticoids
  - History of falls
  - Family history of hip fracture
  - Other causes of secondary osteoporosis
  - Low body mass index (BMI) (<18.5kg/m^2)
  - Smoking
  - Alcohol intake of more than 14 units per week for women and more than 21 units per week for men
- Do not routinely assess fracture risk in people under 50 years unless they have major risk factors (for example, current or frequent recent use of oral or systemic glucocorticoids, untreated premature menopause or previous fragility fracture), because they are unlikely to be at high risk^1

Estimate 10 year probability of ‘total osteoporotic fracture’ using QFracture (a calculation tool is available in EMIS)

NICE confirms that treatment is cost effective if 10 year risk ≥1%, but must consider clinical risks/benefits and patient factors. SIGN 142 recommends if 10 year risk ≥10%, consider a DEXA scan and use this to guide decision along with patient specific factors

Aged 50 to 74 years

Aged 75 years and over

For those who do not reach treatment thresholds or decline treatment, consider Healthy Lifestyle^2 advice
Consider repeat risk assessment only after a minimum of 2 years, or when there has been a change in the patient’s risk factors

Patients aged under 40 years who have a major risk factor, such as history of multiple fragility fracture, major osteoporotic fracture, or current or recent use of high-dose oral or high-dose systemic glucocorticoids (more than 7.5 mg prednisolone or equivalent per day for 3 months or longer)^1 should be referred to secondary care.

Patients taking Aromatase Inhibitors and GnRH Analogues

- Baseline BMD should be assessed by DEXA scan prior to or within three months of starting treatment
- NICE CG80 (breast cancer) advises that bone protection treatment should be offered to patients on aromatase inhibitors who have a T score of ≤-2 (post-menopausal) or ≤ -1 (premature menopause). Patients over 75 with 1 or more risk factors should be offered bone protection treatment and do not require a DEXA scan.
- NICE CG175 (prostate cancer) advises that bone protection should not be routinely offered to patients on GnRH analogues. Patients should be risk assessed as normal and offered treatment if the risk assessment shows it is indicated (as above)
Intolerance is defined as persistent side effects (including upper gastrointestinal disturbance) that are sufficiently severe to warrant discontinuation of treatment, and that occur even though the instructions for administration have been followed correctly. It is not advisable to initiate PPI treatment to manage GI side effects.

NB. The doses in this guideline are recommended by local specialists. However, these are not licensed in all patient groups and situations - please refer to Summary of Product Characteristics (SPC) for full prescribing details.

When to use denosumab?
Denosumab 60mg subcutaneously 6 monthly is an alternative option in line with NICE TA204 and local guidance if unable to comply or intolerant of oral bisphosphonates. The FIT study suggests if >4% BMD loss despite adherent therapy, then consider switching to denosumab.

Denosumab 60mg 6 monthly (in line with NICE TA 204) See local guidance. Near patient testing reimbursement available. Pre-dose testing: Creatinine Clearance (CrCl), serum Ca and 25OHD. If CrCl between 20 and 30 ml/min then must be calcium replete as higher risk of post dose hypocalcaemia.

If denosumab therapy is stopped without switching or at end of denosumab therapy, there is a high rebound risk of vertebral fractures - discuss with secondary care before stopping.

NICE TA464 confirms that people risk assessed in line with CG146 who have a ≥10% 10year risk may be treated cost effectively with IV bisphosphonates. However it is recommended locally that IV agents are reserved, following consideration of patient factors and risk/benefits, for those for whom oral agents are not tolerated or are contraindicated.

**If fragility fracture occurs after more than 6 months oral bisphosphonate therapy, check adherence, secondary causes (exclude atypical fracture – see pg 3) and calcium/ vit D intake (see pg 4). If adherent and Ca/vit D replete then consider discussion with secondary care (Ox.GPosteop@nhs.net) If more than 2 fractures and BMD <-3.5 refer to secondary care for consideration for teriparatide (in line with NICE TA 161)
Take into account that risk assessment tools may underestimate fracture risk in certain circumstances, for example if a person:
• has a history of multiple fractures
• has had previous vertebral fracture(s)
• has a high alcohol intake
• is taking high-dose oral or high-dose systemic glucocorticoids (more than 7.5 mg prednisolone or equivalent per day for 3 months or longer)
• has other causes of secondary osteoporosis.

Take into account that fracture risk can be affected by factors that may not be included in the risk tool, for example living in a care home or taking drugs that may impair bone metabolism (such as anti-convulsants, selective serotonin reuptake inhibitors, thiazolidinediones, proton pump inhibitors and anti-retroviral drugs).

Risk of atypical femoral fracture with bisphosphonates:
During treatment, patients should be advised to report any thigh, hip, or groin pain. Any patient who presents with such symptoms should be evaluated for an incomplete femur fracture. Discontinuation of bisphosphonate therapy in patients suspected to have an atypical femur fracture should be considered while they are evaluated, and should be based on an assessment of the benefits and risks of treatment for the individual. See MHRA guidance for bisphosphonates for full details.

Risk of atypical femoral fracture with denosumab:
During denosumab treatment, patients should be advised to report new or unusual thigh, hip, or groin pain; patients presenting with such symptoms should be evaluated for an incomplete femoral fracture. Discontinuation of denosumab treatment should be considered if an atypical femur fracture is suspected, while the patient is evaluated; an individual assessment of the benefits and risks should be performed. See MHRA guidance for denosumab for full details.

Risk of osteonecrosis of the jaw:
Patients should be advised to maintain good oral hygiene, receive routine dental check-ups, and report any oral symptoms such as dental mobility, pain, or swelling. See MHRA guidance for bisphosphonates and denosumab for full details. Refer to 2◦ care if suspected.

Risk of osteonecrosis of the external auditory canal:
This should be considered in patients who present with ear symptoms including chronic ear infections or in those with suspected cholesteatoma. Patients should be advised to report any ear pain, discharge from the ear, or an ear infection. Possible risk factors include steroid use and chemotherapy, with or without local risk factors such as infection or trauma. See MHRA guidance for bisphosphonates and denosumab for full details.

**Duration of treatment**

- **NICE multimorbidity guidance (NG56)** advises to:
  “Tell a person who has been taking bisphosphonate for osteoporosis for at least 3 years that there is no consistent evidence of:
  o further benefit from continuing bisphosphonate for another 3 years
  o harms from stopping bisphosphonate after 3 years of treatment.
  Discuss stopping bisphosphonate after 3 years and include patient choice, fracture risk and life expectancy in the discussion.”

- **SIGN 142** states that there is:
  “no published evidence was identified from randomised trials to suggest that drug holidays were effective in reducing the risk of skeletal adverse effects”.

- **Management of patients on treatment beyond 10 years should be considered on an individual basis.**

- **Denosumab - duration of treatment**
  - **NICE TA204** states “The Committee accepted that the 5-year treatment duration assumption was appropriate and reflected clinical practice.”
  - The SPC states “The optimal total duration of antiresorptive treatment for osteoporosis (including both denosumab and bisphosphonates) has not been established. The need for continued treatment should be re-evaluated periodically based on the benefits and potential risks of denosumab on an individual patient basis, particularly after 5 or more years treatment duration.”
Calcium and vitamin D Supplementation for bisphosphonates and other bone-sparing drugs

Suggest improvements to dietary calcium

Calculate dietary calcium - see here
For example:
1 pint milk (or equivalent) = 700mg
1 small matchbox of cheese = 200 mg
For more information see:

If on zoledronic, teriparatide or denosumab: also check serum 25OHD

> 50nmol/L
< 50 nmol/L

If cannot increase dietary calcium, ensure patient receives combined, chewable calcium and vitamin D supplement. If not tolerated due to taste, consider non-chewable/dispersible combined

Ensure patient receives 800-1000 IU/day licensed dose of vitamin D

Patient receiving < 700 mg calcium per day
Encourage dietary sources of calcium and ensure patient receives 800-1000 IU/day licensed dose of vitamin D

Patient receiving > 700 mg calcium per day
If on zoledronic, teriparatide or denosumab: also check serum 25OHD

Initial load with 20,000-25,000 IU D3 weekly
**OR** 3,200 IU D3 daily for 12 weeks then equivalent 800 IU/d unless already on calcium / vitamin D supplement. Check calcium 4 weeks after starting loading.

References
1. NICE CG146
2. SIGN 142 (March 2015)
3. NOGG 2017
4. Local Specialist recommendation
5. NICE Quality Standard Osteoporosis
6. FIT study
7. NICE TA 161.
8. NICE CKS Corticosteroids - oral (last revised in August 2015)
10. NICE NG53