Prescribing guidelines for people over 50 years with or at risk of osteoporosis (OP)

Frail, increased fall risk ± housebound / Care home

Advise

Calcium 1g to 1.2g and colecalciferol (800IU) daily

Assess falls risk: seek advice or refer to Falls Service as appropriate

Assessing risk of fragility fracture as per NICE Clinical Guidelines 146:
All women >65 years, men >75 years, anyone over 50 years with risk factors

Previous fragility fracture
If major osteoporotic fracture (spine, hip, forearm or humerus fracture) within 24 months, consider referral for specialist treatments

Age <75 years — Age ≥75 years

Assess patients including clinical risk factors (*note 1*) and fracture risk using FRAX tool (*note 2*). In the tool, view National Osteoporosis Guideline Group (NOGG) guidance to see classification of risk without Bone Mineral Density (BMD). For investigations: see *note 4*

Low risk
Reassure.
Lifestyle advice (*note 3*)
Reassess in ≤ 5 years depending on clinical context.

Intermediate risk
Measure BMD* (DXA** scan, hip ± spine) and recalculate fracture risk with FRAX tool to determine intervention level. Osteoporosis may be assumed in women ≥ 75 year if a DXA scan is clinically inappropriate or unfeasible

High risk
BMD should be measured for baseline but starting treatment to reduce fracture risk should not be delayed.

Very high risk (FRAX >60%)
BMD should be measured for baseline and to guide treatment but starting treatment to reduce fracture risk should not be delayed.

***Bone Mineral Density (BMD) determined by ** Dual-energy X-ray absorptiometry (DXA) results in a T score.**
-Measure BMD in people with intermediate fracture risk by FRAX tool to refine the estimate of 10-year risk.
-Measure BMD in patients with high and very high fracture risk by FRAX tool to guide drug choice and provide a baseline for BMD monitoring.

T score above -1 Normal. Reassure and advise general measures.

T score -1 to -2.4 Osteopenia. Advise general measures and refer to NOGG for treatment guidance.

T score -2.5 or below Osteoporosis. Consider treatment based on age and fracture probability

Intervention level from FRAX tool with BMD

Low risk: lifestyle advice (*note 3*) Reassess in ≤ 5 years depending on clinical context

High risk: treat

Very high risk: refer for specialist treatment

Advise treatment.

-Offer calcium and/or vitamin D supplementation as an adjunct: Calcium 1g to 1.2g and colecalciferol 800iu daily
-Treat vitamin D deficiency and insufficiency prior to initiation of parenteral anti-osteoporosis drug treatment, and alongside initiation of oral anti-osteoporosis drug treatment.
High risk -treat oral anti-resorptive treatments are first line.
Very high risk- refer for specialist initiated or specialist only treatment. If a delay is anticipated start oral anti-resorptive promptly.
Choice of treatment to be made on an individual basis after discussion between patient and clinician about the advantages and disadvantages of the treatments available. If more than 1 treatment is suitable, the lowest cost should be chosen.
If a patient has a fracture while on treatment check adherence to treatment and exclude secondary causes of osteoporosis.

Antiresorptive /Bone-sparing treatments:
Alendronic acid, Risedronate, Zoledronic acid (IV), Denosumab, Raloxifene
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Bone-forming treatments
Teriparatide, Abaloparatide, Strontium.
NB: **Romosozumab** is both bone-sparing & bone- forming

Notes(overleaf)
1.Clinical risk factors
2.FRAX tool
3.Lifestyle advice
4.Investigations
5.MHRA safety advice
6.DXA scan frequency
7.Duration of treatment and bisphosphonate treatment algorithm
8. Local decision on Denosumab to include men

Primary Care treatment options: anti-resorptive agents NICE TA 464: see *note 5* for MHRA safety advice and SmPC

1st line choice: Alendronic acid 70mg tablets once a week postmenopausal women and men (men unlicensed but in line with NOGG)
If cannot tolerate alendronic acid 70mg: **Risedronate 35mg tablets once a week** (postmenopausal women and men)
Alternative choice Ibandronic acid 150mg once a month (postmenopausal women). Reduction in hip fractures NOT demonstrated.
-All patients should have a dental check-up, and any necessary remedial work performed, before bisphosphonate treatment, or as soon as possible after starting treatment. Routine dental check-ups should continue when on treatment as risk of osteonecrosis of the jaw (ONJ). Further information on patient risk for ONJ
-Oral bisphosphonates should be swallowed whole with a glass of tap water 30 to 60 minutes before the first food or drink (other than tap water) of the day. Patients should stand or sit upright (not lie down) for at least 30 minutes post dose. Discontinue treatment if oesophageal ulceration, erosion, stricture, or severe lower gastrointestinal symptoms occur.
-Check tolerance and adherence at 3 to 4 months and then check adherence at least annually.
Duration of treatment and reassessment of risk: see *note 7* and algorithm on page 3.
If a patient has a fracture whilst on treatment

- check adherence to treatment and exclude secondary causes of osteoporosis
- **REFER** for specialist options but do not stop current OP treatment.

If bisphosphonates are contra-indicated (see individual SmPCs), are not tolerated or if patient has moderate to severe renal impairment (<35ml/minute calculated creatinine clearance) REFER for consideration of specialist treatments.
DO NOT CO-PRESCRIBE bisphosphonates with any other OP treatment.

Specialist initiated treatments (amber initiation RAG rating):

The following treatments may be considered if bisphosphonates are not tolerated or not appropriate
see *note 5* for MHRA safety advice and refer to SmPC

Denosumab (Prolia®) Initiate in line with NICE TA 204 for primary and secondary prevention in postmenopausal women and local decision for men see *note 8*. Prescribing may be transferred to Primary Care in line with Transfer of Care Protocol. If patient has severe renal impairment, prescribing and monitoring responsibility to remain under specialist team. Pre-existing hypocalcaemia must be treated before starting and calcium levels MUST be checked within the 4 weeks preceding each dose due to risk of severe hypocalcaemia. Long term management plan must be in place to ensure 6 monthly dose is given at correct time to prevent rebound bone loss. Denosumab must not be stopped without a plan for subsequent anti-resorptive therapy (oral or IV bisphosphonates) without delay and good oral health should be maintained throughout treatment (SmPC). For further prescribing advice see MHRA alerts (*note 5*) and refer to Transfer of Care Protocol

Raloxifene Is not recommended as a treatment option for the primary prevention of osteoporotic fragility fractures in postmenopausal women NICE TA 160. Initiate raloxifene for secondary prevention of fragility fractures in postmenopausal women who have osteoporosis and have sustained a clinically apparent osteoporotic fragility fracture in line with NICE TA 161. A significant reduction in the incidence of vertebral, but not hip fractures has been demonstrated (SmPC). Avoid in severe renal impairment or if family history of venous thromboembolism.

Strontium European Medicines Agency (EMA) restricted use in 2014 due to cardiovascular safety concerns (subsequently withdrawn in Europe, available in UK): for treatment of severe OP in post-menopausal women & men at high risk of fracture when other OP treatments are contraindicated or not tolerated, risk-benefit in relation to cardiovascular and thromboembolic events must be considered and discussion with patient documented. Specialist to counsel patient on signs and symptoms of severe skin reactions and actions to take. **Existing patients should be reviewed & switch to alternative if appropriate**. NOGG SIGN 142. **A consultation will be undertaken on place in therapy of strontium for new patients, until approved specialist prescribing and monitoring only (RED RAG status for new patients)**

Hospital-only treatments (red RAG rating): see *note 5* for MHRA safety advice and refer to SmPC.

1st line bisphosphonate: IV Zoledronic acid NICE TA 464 (postmenopausal women & men) **see** MHRA 'Adverse effect on renal function'
Alternative bisphosphonate: IV Ibandronic acid NICE TA 464 (postmenopausal women). Reduction in hip fractures NOT demonstrated.
Teriparatide biosimilar: Initiate in line with locally agreed guidance[1] and NICE TA 161 for secondary prevention of fragility fractures in postmenopausal women who have osteoporosis and have sustained a clinically apparent osteoporotic fragility fracture. Lifetime treatment duration must not exceed 24 months. Once treatment stopped, start anti-resorptive treatment (oral or IV bisphosphonate or denosumab) without delay. Teriparatide is contraindicated in severe renal impairment and hypercalcaemia. Teriparatide for the secondary prevention of osteoporotic fragility fractures in men is recommended in line with NHSE Clinical Commissioning Policy Statement: Teriparatide for Osteoporosis in Men (adults)

1. Teriparatide biosimilar can be considered as an option alongside romosozumab or abaloparatide in those at very high fracture risk in line with NICE TA 791 and TA 991 (APC Jan 2025).

Abaloparatide: Initiate in line with NICE TA 991 for treating osteoporosis after menopause in women, trans men and non-binary people, only if they have a very high risk of fracture. The maximum total duration of treatment with abaloparatide should be 18 months. Following cessation of abaloparatide therapy, patients may be continued on other osteoporosis therapies such as bisphosphonates.
Romosozumab: Initiate in line with NICE TA 791). Postmenopausal women who are at high risk of fracture and only if they have had a major osteoporotic fracture (spine, hip, forearm or humerus fracture within 24 months (so are at imminent risk of another fracture). Usual treatment length 12 months, lifetime treatment must not exceed this. Once treatment complete start antiresorptive treatment (oral or IV bisphosphonate or denosumab) without delay. Specialist to counsel patient and advise primary care to add note to patient record stating: **If patient has a heart attack or stroke whilst on romosozumab treatment to inform the specialist.** **If people with the condition and their healthcare professional consider abaloparatide, romosozumab and teriparatide to be suitable treatments, after discussing the advantages and disadvantages of all the options, the least expensive suitable treatment should be used. Administration costs, dosages, price per dose and commercial arrangements should all be taken into account.**

Patient Information
Versus Arthritis https://www.versusarthritis.org/about-arthritis/conditions/osteoporosis/
Royal Osteoporosis Society https://theros.org.uk/
NHS.uk https://www.nhs.uk/conditions/osteoporosis/
Patient.co.uk https://patient.info/bones-joints-muscles/osteoporosis-leaflet

Abbreviations:
NICE TA: National Institute for Health and Care Excellence Technology Appraisal
NOGG: National Osteoporosis Guideline Group
SIGN: Scottish Intercollegiate Guidelines Network
SmPC: Summary of Product Characteristics

Note 1: Clinical Risk Factors (CRFs) / Indicators of Low Bone Mineral Density (BMD) to be considered when assessing the patient. NICE CG146
•Age
•Previous fragility fracture
•Parental history of hip fracture
•Alcohol intake of more than 14 units per week
•Oral corticosteroids current or frequent use
•Causes of secondary OP (FRAX tool includes rheumatoid conditions only
•Low body mass index (defined as <18.5kg/m²)
•Conditions that result in prolonged immobility
•Smoking

Note 2: FRAX® tool
Algorithms can integrate the weight of CRFs for fracture risk with or without information on BMD. The FRAX® tool computes the 10-year probability of hip fracture or a major osteoporotic fracture (clinical spine, hip, forearm or humerus) for several European countries, including the UK. The tool has been externally validated in independent countries and widely used. The FRAX® tool is used and recommended by local specialists.
Limitations of using the FRAX® tool are:
• When the absolute fracture risk in patients of extreme ages is calculated.
• Neck of Femur BMD used to assess risk of fracture, not lumbar spine.
QFracture2012 tool. NICE have recommended the use of fracture risk assessment tools FRAX or QFracture2012 (https://qfracture.org/) in the assessment of patients

Note 3: Lifestyle advice NOGG , CKS
• Recommend a balance diet especially with adequate calcium and vitamin D intake
• Recommend regular tailored weight bearing and muscle-strengthening exercise
• Maintain body weight
• Support and encourage smoking cessation and drink alcohol within recommended limits
• Assess falls risk and give advice if appropriate
• Reduce dose of glucocorticoid when possible

Note 4 Investigations for all patients
- FBC, ESR (If ESR raised, measure serum paraproteins and urine Bence Jones protein)
- Bone and liver function tests (Ca, P, Alk phos, albumin, ALT/ γGT)
- Serum creatinine

Additional tests if indicated:
- Serum TSH.
- Serum 25 0H VitD and PTH
- Lateral thoracic and lumbar spine X rays
- Isotope bone scan
- Serum testosterone, LH and SHBG, PSA (men)
- BMD if monitoring required

Note 5 MHRA safety advice
Bisphosphonates: atypical femoral fracture (AFF) Dec 2014
Bisphosphonates: osteonecrosis of the jaw Dec 2014. See also Further information on patient risk for ONJ
Bisphosphonates: atrial fibrillation Dec 2014
Bisphosphonates: very rare reports of osteonecrosis of the external auditory canal Dec 2015
IV Zoledronic acid: adverse effects on renal function Dec 2014
Denosumab: hypocalcaemia fatalities and risk during treatment Dec 2014
Denosumab: rare cases of atypical femoral fracture with long term use Dec 2014
Denosumab: minimising risk of osteonecrosis of the jaw and monitoring for hypocalcaemia Dec 2014
Denosumab: Reports of osteonecrosis of the external auditory canal June 2017
Denosumab: Increased risk of multiple vertebral fractures after stopping or delaying ongoing treatment Aug 2020
Strontium: cardiovascular risk. Restricted indication and monitoring requirements Dec 2014

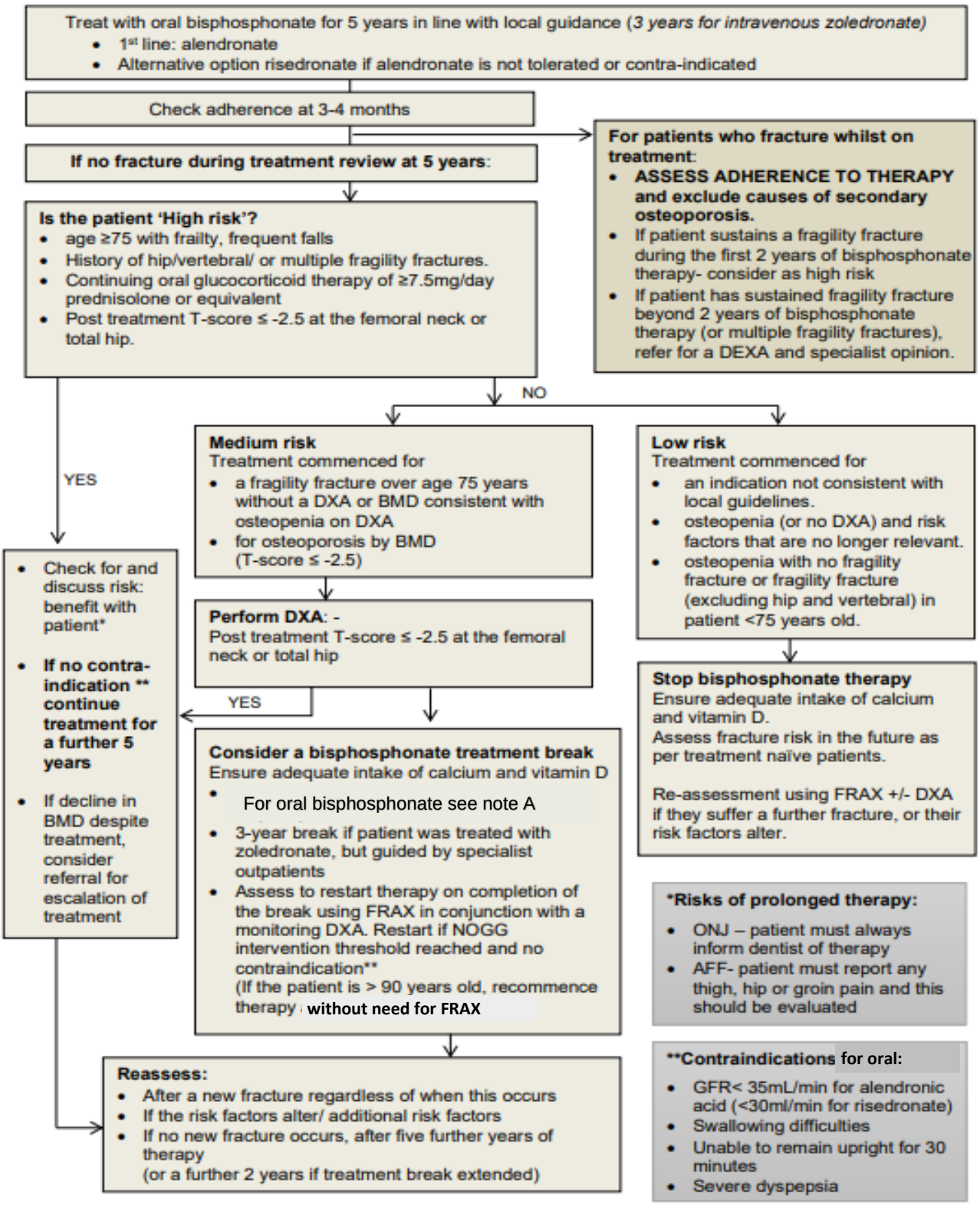
Note 6 Dual-energy X-ray absorptiometry (DXA) Scan frequency, measuring Bone Mineral Density
• Following initiation of bisphosphonate (oral or IV) or denosumab therapy consider a repeat DXA after 3 to 5 years therapy as part of ongoing review
• Ongoing bisphosphonate / denosumab therapy: consider repeating DXA every 2 to 3 years^
• Patients receiving glucocorticoids (long term): consider repeating DXA every 1 to 3 years^
• Presence of a recent fracture: Consider a repeat DXA after 1 to 3 years^
• Patients over 65 years who have had a recent fracture and who are prescribed short intermittent courses of steroids (i.e., not on a course for > 3 months): Consider repeating DXA after 1 to 3 years
^exact frequency will vary depending on clinical risk factors

Note 7: Duration of treatment
Bisphosphonates: see algorithm page 3
Denosumab: review patient in line with transfer of care protocol and refer back for ongoing management advice in line with protocol.
Drug holiday advice does not apply to denosumab as the suppressive effect on bone turnover appears to reduce within the first 6 months after stopping treatment.
Strontium: If still high risk in 3-to-5-year DXA discuss continuing treatment. Seek specialist advice for duration.
Teriparatide, abaloparatide and romosozumab: see 'hospital only' box on page 1

Note 8 Local decision on Denosumab to include men (HMMC Sept 2014, MOPB July 2016):
Denosumab (60mg) is recommended (Amber Initiation) as a treatment option for post-menopausal women with osteoporosis, and osteoporotic men (unless for treatment of bone loss associated with hormone ablation in men with prostate cancer as there was no submission for this indication in the NICE TA) in the following situations:
1st line in patients with severe renal impairment (eGFR <30ml/min) (as other treatments are contraindicated), **OR**
Where a patient is unable to comply with the administration instructions for oral/IV bisphosphonates **OR**
When oral/IV bisphosphonates are contraindicated or not tolerated (leading to discontinuation).

Primary Care Bisphosphonate Treatment Algorithm

see note 7 and 'hospital only' box page 1 for treatment duration for non bisphosphonates



Note A.

- **2-year treatment break if patient is on oral alendronic acid**
- **18-month treatment break If patient is on risedronate or oral ibandronic acid**

AFF- Atypical Femoral Fracture

Oral bisphosphonate treatment algorithm with kind permission from Derbyshire ICB with minor amendment note A

Prevention and Treatment of Glucocorticoid-induced Osteoporosis in Postmenopausal Women & Men (age ≥ 50 years). *Pre-menopausal women and men less than 50 years should be referred to a metabolic bone disease specialist*

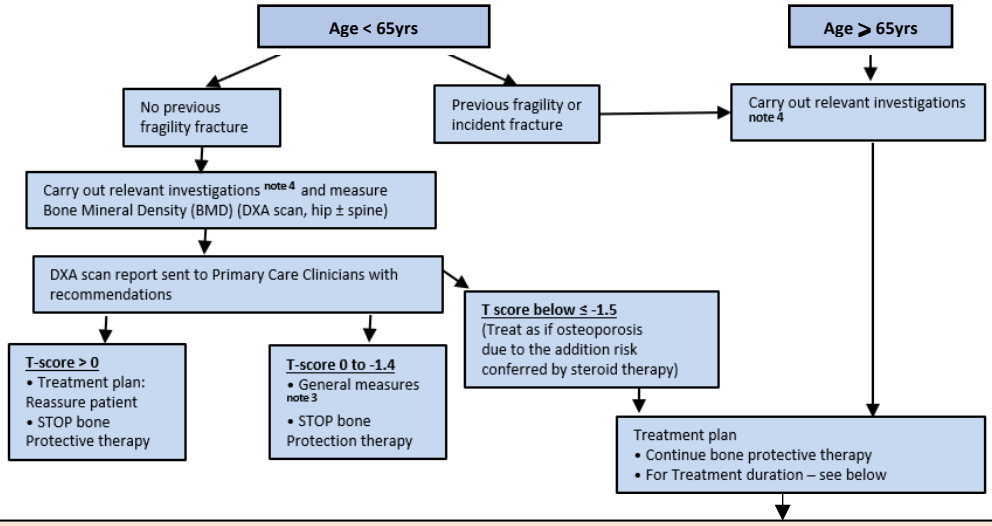
Applicable Criteria: Post-menopausal Women & Men (age ≥ 50 years)

- **Patients starting on long term oral corticosteroids** (i.e. (typically a steroid dose of prednisolone ≥ 7.5mg per day (or equivalent), and expected to be for ≥ 3 months) [SIGN 142]
- **Patients already on long term glucocorticoid therapy (**irrespective of dose prescribed as it depends on cumulative dose exposure) [SIGN]
- **Patients who have received repeated short-term courses of steroids (e.g., for asthma) with a cumulative dose equivalent to 1.5g per year**

(High dose inhaled corticosteroids-Clinicians should be aware of the potential risk of developing osteoporosis and other side effects from the use of high-dose inhaled corticosteroids and should discuss the risk with patients. There are no set guidelines available and the need for bone protective therapy should be decided on a case by case basis (i.e., may be required if patient has multiple risk factors)

Initial Treatment plan : applicable to all patients who fit the above criteria

- Initiate bone protective therapy (see medical management options below) – duration is dependent on age, steroid dose, length of steroid exposure and associated clinical risk factors
- Prescribe calcium 1-1.2g + colecalciferol 20mcg (800IU) daily unless confident that patient has an adequate calcium intake and is vitamin D replete.
- Request a DXA scan (if appropriate) (NB: treatment should always be started straight away regardless of whether a DXA scan has been requested or not, as it is known that rapid bone loss occurs within the first 3 – 6 months of steroid therapy)



The choice of treatment should be made on an individual basis after discussion between the patient and their clinician about the advantages and disadvantages of the treatments available. If more than 1 treatment is suitable, the lowest cost should be chosen (taking into account administration costs, dosage and cost per dose).

Primary Care treatment options: anti-resorptive agents: (NOGG) see *note* 5 for MHRA safety advice and SmPC

1st line choice: Alendronic acid 70mg tablets once a week

If cannot tolerate alendronic acid 70mg**: Risedronate 35mg tablets once a week**

All patients should have a dental check-up, and any necessary remedial work performed, before bisphosphonate treatment, or as soon as possible after starting treatment. Routine dental check-ups should continue when on treatment as risk of osteonecrosis of the jaw (ONJ). Further information on patient risk for ONJ

-Oral bisphosphonates should be swallowed whole with a glass of tap water 30 to 60 minutes before the first food or drink (other than tap water) of the day. Patients should stand or sit upright (not lie down) for at least 30 minutes post dose. Discontinue treatment if oesophageal ulceration, erosion, stricture, or severe lower gastrointestinal symptoms occur.

-Check tolerance and adherence at 3 to 4 months and then adherence at least annually.

If bisphosphonates are contra-indicated (see SmPC), are not tolerated or if patient has moderate to severe renal impairment (<35ml/minute calculated creatinine clearance) REFER to specialist.

DO NOT CO-PRESCRIBE bisphosphonates with any other OP treatment.

Clinicians should seek specialist opinion if patient sustains a fracture on therapy

Hospital only treatment option (NOGG)

IV Zoledronic acid see MHRA 'Adverse effect on renal function'

Treatment Duration review: Guidance for Primary Care Clinicians

For patients on long term steroids: Continue to prescribe bone protective therapy

- **Bisphosphonate oral therapy- review treatment +/- DXA after 5 years. Duration of treatment is dependent on presence of risk factors (see primary care bisphosphonate treatment algorithm)**

For patients where steroid therapy has been discontinued:

- **Bisphosphonates - review patient and re-assess fragility fracture risk when steroid therapy is stopped (if no other risk factors). NOGG advises if glucocorticoid therapy is stopped, withdrawal of bone-protective therapy may be considered at the same time, provided on re-assessment of fracture risk using FRAX, the probabilities of both major osteoporotic fracture and of hip fracture lie below the intervention threshold.**

References all accessed Dec 2022

NICE TAs

NICE TA 160 Raloxifene for the primary prevention of osteoporotic fragility fractures in postmenopausal women (Oct 2008 (amended Jan 2010 and Jan 2011))
NICE TA 161 Raloxifene and teriparatide for the secondary prevention of osteoporotic fragility fractures in postmenopausal women (Oct 2008 (amended Jan 2010 and Jan 2011))
NICE TA 204 Denosumab for the prevention of osteoporotic fractures in postmenopausal women (Oct 2010)
NICE TA 464 Bisphosphonates for treating osteoporosis, Aug 2017, updated Feb 18 (partially replaces TA160 & TA161)
NICE TA 791 Romosozumab for treating severe osteoporosis, May 2022
NICE TA 991 Abaloparatide for treating osteoporosis after menopause, Aug 2024

NICE clinical guidance and quality statements
NICE CG 146 - Assessing the risk of fragility fractures in people with osteoporosis, Aug 2012 CG146
NICE Quality Standard 149 Osteoporosis, April 2017 https://www.nice.org.uk/guidance/qs149/resources/osteoporosis-pdf-75545487906757
NICE Clinical Knowledge Summary Osteoporosis-prevention of fragility fractures

Guidelines from other specialist bodies:
SIGN :142 osteoporosis
NOGG Full clinical guideline

Electronic Medicines Compendium (For SmPC)

MHRA safety advice
Bisphosphonates: atypical femoral fracture Dec 2014
Bisphosphonates: osteonecrosis of the jaw Dec 2014
See also Further information on patient risk for ONJ
Bisphosphonates: atrial fibrillation Dec 2014
Bisphosphonates: very rare reports of osteonecrosis of the external auditory canal Dec 2015
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Strontium: cardiovascular risk. Restricted indication and monitoring requirements Dec 2014

Oral bisphosphonate treatment algorithm has been included within the guidelines with kind permission from Derbyshire ICB.

Prevention and treatment of glucocorticoid-induced osteoporosis has been included based on the guidelines from Mid and South Essex ICS, with acknowledgement and thanks.

Bisphosphonate_length_of_treatment_in_osteoporosis.pdf (derbyshiremedicinesmanagement.nhs.uk)

Version:	2.0
Approved by:	Hertfordshire & West Essex Area Prescribing Committee
Date approved / updated	February 2023, Jan 2025
Developed by:	Developed by pharmacy and medicines optimisation team Hertfordshire and West Essex (HWE) ICB with relevant HWE ICS stakeholders.
Review date	This recommendation is based upon the evidence available at the time of publication. This recommendation will be reviewed upon request in the light of new evidence becoming available.
Superseded version	1.0 Addition of NICE TA 991 Abaloparatide for treating osteoporosis after menopause and local agreement for using teriparatide biosimilar as an option alongside romosozumab or abaloparatide in those at very high fracture risk in line with NICE TA 791 and TA 991 (Jan 2025).