

Osteoporosis Management in Primary Care -Summarised Pathway

Step 1 – FRAX assessment

1. Perform FRAX Assessment [Frax Calculator](#) | [FRAXplus®](#) (see website)

Test for FRAX if: -

>50 yrs with risk factors /fragility # /<50 yrs on steroids (see guidelines)

Drugs- Depo- progesterone /PPI/anti-epileptic drugs

2. FRAX result interpretation- Depending on FRAX score:

Reassure OR Referral for DXA OR Start Tx with bisphosphonate AND refer for DXA

The FRAX graph will guide you as to which of the above options to take.

Step 2 – DXA and other investigations

Consider DXA in young women >18 yrs old who have multiple risk factors ie Depo -progesterone and smoking. FRAX will not be helpful in this group.

3. DXA Performed

- Bone mineral density BMD assessed and FRAX recalculated.

4. Patient returns to GP

a. Exclude secondary causes of osteoporosis (see tests below)

b. Commence bone protection treatment as directed by FRAX assessment.

c. Ensure dental checks up to date and dental extractions done before bisphosphonate commencement.

*Document risk/benefit conversation re: dental complications if bone health priority and dental services not accessed

d. Referral to falls clinic if osteoporosis and recurrent falls

*P1NP: procollagen extension peptide.

Procollagen 1 (P1NP) concentrations reflect osteoblast activity. It is a bone turnover marker. It is helpful in signalling bone resorption.

Any disease increasing the activity of osteoblasts will result in elevated P1NP.

Low P1NP may indicate adynamic bone.

Baseline before bisphosphonate >80ug/L

P1NP should drop with bisphosphonates

[click P1NP for further guidance](#)

Investigations

Vitamin D (**essential to be in normal range**)

Bone profile and PTH

*P1NP -baseline (brown bottle)

LFT/TFT

FBC / ESR (myeloma screen if elevated)

Serum Cr/eGFR

Coeliac screen

Pre-menopausal women FSH/LH

Men-Serum testosterone

Step 3- Bisphosphonates

5. Calcium and Vit D replacement (see formulary**)

1st line Calci-D chewable tablets

2nd line AccreteD3tabs/Adcal D3 caplets

Commence Bisphosphonates

CI :Oral bisphosphonates - eGFR< 30, upper GI ulceration/oesophagitis/ inability to sit upright 30-60 min, hypocalcaemia (BNF)

1st Line alendronic acid

2nd Line risedronate sodium

3rd line / 4th line see APC guidelines**

AND give patient leaflet

6. At 3 months check compliance of bisphosphonate/Calcium- Vit D use

- 30 minutes before breakfast – completely empty stomach - no other meds or drinks before - take with large glass of water – no eating or drinking for 30 mins after -stay sat up for 30 mins.

- Check Calcium/Vit D compliance. Need 4-hour window between bisphosphonates and calcium supplementation. Take after lunch

7. At 6 months check effectiveness/side effects of bisphosphonates

-**jaw necrosis**- (reminder regular dental checks / optimal dental care)

- **atypical hip #**- (grumbling new hip/upper thigh pain / subtrochanteric bump- pelvic X ray to exclude subtrochanteric #)

-**auditory osteonecrosis**- (recurrent ear infections)

- GP to recheck **P1NP**

- If P1NP <35 ug/L and/or fall >10 ug/L continue Bisphosphonates (5yrs for oral / 3yrs for iv)

- If P1NP >35 ug/L and fall <10 ug/L - check compliance

- Ask for Advice/ Guidance if necessary -[see P1NP notes below for further guidance](#)

Step 4 – Continuation OR PAUSE in Bisphosphonate Tx

[see Guidelines below -How to address a Bisphosphonate pause](#)

also see Barnsley Osteoporosis drug holiday guidelines

10. If a NEW fragility Fracture while on Tx:

IF < 2 yrs of bisphosphonate Tx then continue same Tx

IF > 2 yrs of bisphosphonate Tx THEN REFER

8. HIGH RISK patients

-Previous fracture of the hip/vertebrae -OR > 75 yrs of age

Continue Tx 10 years for alendronic acid / 7 years for risedronate

-on prednisolone \geq 7.5mg/day

when steroid stopped- stop bisphosphonate and reassess need to continue Tx

9. IF NO FRAGILITY fracture while on Tx

THEN Reassess with DXA and FRAX after 5 yrs of oral Tx / (3 yrs if iv Tx- once discharged from hospital)

Bone Density scans need to be timed correctly to Bisphosphonate treatment

Recheck P1NP At the time of considering a bisphosphonate treatment pause, P1NP should be suppressed ie <35 ug/L and/or fall >10 ug/L [see P1NP notes below](#)

If there is no baseline value, <35 ug/L will be the expected value.

9a. HIGH RISK IF

FRAX > intervention threshold

OR HIP BMD T score < -2.5

Continue Bisphosphonate Tx

9b. LOW RISK IF

FRAX < intervention threshold

AND BMD T score > -2.5

AND P1NP should be suppressed ie <35 ug/L and/or fall >10 ug/L.

CONSIDER DRUG TREATMENT PAUSE

Repeat FRAX AND BMD at 2 yrs

restart Tx if – T score \leq -2.5/new # / significant decrease in BMD

9c. After 10 years of continuous NO PAUSE treatment with bisphosphonates,

strong consideration for treatment pause needs to be made

treatment for longer than 10 years is on an individual basis.

Seek Specialist Advice if Osteoporosis in the following groups :

Young people with low bone mas- Osteoporosis/ premenopausal woman /men under 50 / eGFR<30ml/min/ unsatisfactory response- recurrent fractures beyond 2 yrs of Tx /intolerance of oral Rx /

severe osteoporosis(T score less than -3.5 or more than 2 vertebral fractures/

VERY HIGH Fracture risk on FRAX .Those to be considered for Anabolic therapy – ie fit young people with osteoporosis and hip or vertebral fractures in the previous 2 years

Hypercalcaemia- referral to endocrinology

Refer/Advice and guidance

RHEUMATOLOGY DEPT Barnsley OR BONE UNIT - Sheffield Teaching Hospitals

**references- Management of Osteoporosis and fracture Risk/Osteoporosis Drug holiday /Ca and Vit D formulary

HOW TO ADDRESS A BISPHOSPHONATE TREATMENT PAUSE

Osteoporosis is a long-term condition for which there is currently no cure, therefore life-long treatment and monitoring to prevent fractures is often required.

The current advice from the National Osteoporosis Guideline Group (NOGG) guidelines is as follows:

“Recommendations

1. Plan to prescribe oral bisphosphonates (alendronate, ibandronate and risedronate) for at least 5 years and then re-assess fracture risk. Longer durations of treatment, for at least 10 years, are recommended in the following men and women (Strong recommendation) ([see Figure 4](#)):
 - Age ≥ 70 years at the time that the bisphosphonate is started
 - Who have a previous history of a hip or vertebral fracture(s)
 - Treated with oral glucocorticoids ≥ 7.5 mg prednisolone/day or equivalent
 - Who experience one or more fragility fractures during the first 5 years of treatment (if treatment is not changed).
2. Plan to prescribe intravenous bisphosphonate (i.e., zoledronate) for at least 3 years and then re-assess fracture risk. Longer durations of treatment, for at least 6 years, are recommended in the following men and women (Strong recommendation) ([see Figure 5](#)):
 - Age ≥ 70 years at the time that the bisphosphonate is started
 - Who have a previous history of a hip or vertebral fracture(s)
 - Treated with oral glucocorticoids ≥ 7.5 mg prednisolone/day or equivalent
 - Who experience one or more fragility fractures during the first 3 years of treatment (if treatment is not changed).
3. If a new fracture occurs after bisphosphonate treatment is discontinued, reassess using FRAX and restart treatment (Strong recommendation).
4. If bisphosphonate treatment is discontinued and no new fracture occurs, reassess using FRAX after 18 months for risedronate and ibandronate, 2 years for alendronate and 3 years for zoledronate to inform whether treatment should be restarted (Strong recommendation).”

(above is an excerpt of current guidelines)

Once treatment initial treatment duration has been reached, a treatment pause ought to be considered. This entails

[1. Serum P1NP- Bone turnover marker](#)

[2. Bone density scan \(DXA\),](#)

[3. Fracture status \(low trauma fracture while on treatment yes/no\)](#)

[4. Fracture Risk Assessment](#)

Serum P1NP- Bone Turnover Marker

Serum procollagen type 1 N-terminal peptide is a bone turnover marker measuring bone formation however it is very helpful in signalling bone resorption as these processes are interlinked.

It has very little circadian variation and interference with food therefore easily measured in clinical practice.

A baseline P1NP is of concern if above normal limits and in the absence of a ready explanation such as a fracture within the previous year, diseases of liver, kidney or skin disease, vitamin D deficiency, hyperthyroidism, hyperparathyroidism, Paget's or skeletal metastases. Most of these conditions will be obvious from the medical history and osteoporosis blood screen.

A low baseline P1NP does not preclude commencing bisphosphonates.

P1NP level will drop with bisphosphonate treatment.

The benefit of adding P1NP to treatment pause assessment is that it will identify a number of people who would benefit from further treatment but who have not lost bone density or refractured while on treatment.

This is the information offered with a P1NP Barnsley blood report:

"BISPHOSPHONATE MONITORING

Baseline: >80 ug/L -unless recent fracture, seek cause of high bone turnover.

Response at 6 months:

Good: <35 ug/L and/or fall >10 ug/L

Suboptimal: >35 ug/L and fall <10 ug/L

P1NP can be increased in renal, liver and skin disease and decrease by high dose steroids (>15mgprednisolone/day). Please see guideline.<http://tinyurl.com/sth-mb-gl>"

P1NP measure is advocated early into treatment (such as 6 months) to gauge compliance and in cases compliance may improve when people are aware of their results.

At the time of considering a bisphosphonate treatment pause, P1NP should be suppressed ie <35 ug/L and/or fall >10 ug/L.

If there is no baseline value, <35 ug/L will be the expected value.

DXA

Bisphosphonates are antiresorptive agents and therefore a significant increase in bone density is not expected. More often a lack of deterioration is seen as a good response.

DXA report will give information on change from previous scan and whether this is significant. Currently at Barnsley a significant change in bone density is 4-5%.

Of note, only scans undertaken in the same machine can be formally compared. This is due to the different way scanners take their measure, which can cause apparent loss/gain when compared to measures in a different machine.

Weight gain can also spuriously suggest bone gain and weight loss suggest bone loss. This is due to the body composition interference in the measures rather than an actual bone gain or loss.

Due to its radiation and limitation in detecting significant changes in bone density, DXA scans are limited to usually a minimum of 2 years. The report will advise on the suggested timing of next scan.

Fracture status

Treatment failure is considered as EITHER a drop of bone density and a low trauma fracture OR 2 low trauma fractures irrespective of bone density, after a year with good compliance with treatment.

Peripheral fractures will be easily identified by asking. However vertebral fractures may go unnoticed and it is recommended to ask for back pain (change if present long term and previously imaged or new onset) and examine for thoracic kyphosis. The presence of either should prompt an xray of the spinal area of interest.

Fracture risk assessment

Commonly FRAX is used for the purpose of fracture risk assessment.

There are certain values that will not change, such as previous history, and others that are modifiable such as smoking, alcohol, glucocorticoids, new illnesses and up to date bone density. Indeed the presence of the first fracture will have a heavy impact on FRAX if previously there were no fractures. However subsequent fractures do not add weight to FRAX.

Please note that only low trauma fractures are relevant for the fracture tick box.

FRAX does not take into account either the duration of osteoporosis treatment. Therefore potentially somebody may have the same FRAX before and after treatment if bone density has not substantially improved (not an unusual situation).

However it is of particular help when trying to establish the next course of action in somebody with a new fracture or when first considering treatment for somebody with newly identified osteoporosis.

For example, treatment naïve people with VERY high fracture risk may be considered for parenteral rather than oral therapy.

Usual scenarios:

1. End of planned 5-10 year bisphosphonate treatment course. No new fractures. No bone loss. Suppressed P1NP. Consider treatment pause.
2. End of planned treatment 5-10 year course. No new fractures. No bone loss. P1NP not suppressed. If not compliant, address compliance. If good compliance, refer to osteoporosis clinic for parenteral therapy.
3. Treatment failure (EITHER a drop of bone density and a low trauma fracture OR 2 low trauma fractures irrespective of bone density, after a year with good compliance with treatment). Refer to osteoporosis clinic.
4. Fracture of neck of femur. NOGG recommends zoledronate over oral bisphosphonates. Refer to osteoporosis clinic.
5. Severe osteoporosis (T-score -3.5 or below or multiple vertebral fractures) or VERY high fracture risk on FRAX. Refer to osteoporosis clinic.
6. Fit, osteoporotic on DXA, with a first vertebral or hip fracture. Refer to osteoporosis clinic if they would consider self injected parenteral anabolic therapy.
7. Contraindications or failure to tolerate oral bisphosphonates. Refer to osteoporosis clinic.

Assessment after treatment pause

Once intended duration of treatment pause has elapsed (18 months for risedronate and ibandronate, 2 years for alendronate and 3 years for zoledronate), please reassess as at the start of treatment pause.

Usual scenarios:

1. No new fracture. No bone loss. Suppressed P1NP. Continue treatment pause for 18-24months and reassess.
2. No new fracture. Bone loss or no longer suppressed P1NP. Restart previous osteoporosis medication. If that was oral bisphosphonates, this can take place in primary care. If this was parenteral bisphosphonates, refer to osteoporosis clinic.
3. New fracture. If towards the beginning of treatment pause, refer to osteoporosis clinic. If towards the end of treatment pause, restart previous osteoporosis medication. If that was oral bisphosphonates, this can take place in primary care. If this was parenteral bisphosphonates, refer to osteoporosis clinic.