BOB ICS Osteoporosis therapies and dental care guidance for patients at risk of or with suspected Medication Related Osteonecrosis of the Jaw (MRONJ)

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This guidance is aimed at primary care clinicians and community dentists. It only refers to patients with suspected Medication Related Osteonecrosis of the Jaw (MRONJ) related to osteoporosis treatment/prevention, **NOT** patients who are on these drugs for other reasons such as cancer/inflammatory bowel disease/other conditions.

What are osteoporosis and osteoporotic fractures?

Osteoporosis is defined by the National Institute for Health and care Excellence (NICE) as a disease characterized by low bone mass and structural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.(1). Osteoporotic fractures occur after a fall from standing height or less.

What is Medication related osteonecrosis of the jaw (MRONJ)?

MRONJ is identified when exposed bone is present for more than eight weeks following a dental procedure or diagnosis, that can be probed through an intraoral or extraoral fistula, in the maxillofacial region in patients with a history of treatment with anti-resorptive (bisphosphonates, denosumab) or anti-angiogenic drugs, and where there has been no history of radiation therapy to the jaw or no obvious metastatic disease to the jaws.(2) MRONJ is a recognised adverse drug reaction and should be reported to the MHRA yellow card reporting site accordingly.
https://yellowcard.mhra.gov.uk/

What are the osteoporosis and oncological doses of osteoporosis medications?

As the risk and severity of MRONJ is significantly greater when osteoporosis medications are used at oncological doses, it is important to record the name and dose of osteoporosis medication.

Osteoporosis related doses
Alendronate oral 70mg weekly
Risedronate oral 35 mg weekly
Ibandronate oral 150mg monthly
Ibandronate iv 3mg every 3 months

Zoledronate iv 4-5mg annually
Denosumab sc 60mg 6 monthly
Oncology related doses
Ibandronate oral 50mg daily
Ibandronate iv 6mg monthly
Clodronate oral 1.6g daily
Zoledronate iv 4mg monthly, 3 monthly, 6 monthly
Denosumab sc120mg monthly

How common is it?

MRONJ is rare. The risk and severity in patients with osteoporosis is significantly lower than the risk for patients being treated with osteoporosis treatments for cancer. Estimates range from 0 to 0.1% (1 per 10,000 and 100,000 patients taking oral bisphosphonates) but the evidence for these estimates is very poor and more research is needed. The American Association of Oral and Maxillofacial Surgeons (AAOMS) reported that after 10 years of follow-up, among patients exposed to Denosumab, the risk for MRONJ was reported to be 0.3 percent, almost an order of magnitude higher than for bisphosphonates. This level of increased risk is backed up by a recent Australian study in a specialist led MRONJ clinic.(2,3)

What are the symptoms and signs of MRONJ?

The symptoms and signs include delayed healing following a dental extraction or other oral surgery, pain, soft tissue infection and swelling, numbness, paraesthesia or exposed bone. It can also occur spontaneously with no preceding dental intervention, often affecting the mylohyoid ridge.

Staging of MRONJ is important to,

a) make the diagnosis
b) inform clinical and patient discussions to inform progression and risk and benefits of continuing osteoporosis treatments.

Current, up to date staging is provided by AAOMS in 2022 and is summarised below, https://doi.org/10.1016/j.joms.2022.02.008):
Stage 0: No clinical evidence of necrotic bone, but symptoms such as pain with no obvious odontogenic cause and suggestive radiographic features. Importantly, includes excluding chronic periodontal disease as a potential cause (see below)
Stage 1: exposed and necrotic bone or fistula (77% of cases)
Stage 2: exposed necrotic bone with related symptoms of inflammation or infection such as pain, swelling, discharge, bad taste, numbness
Stage 3: Extra-alveolar extension of exposed bone or pathological fracture or extraoral fistula/ oro-antral/ oro-nasal communication

Criteria for stage 0 / non-exposed ONJ

Symptoms

1. Odontalgia not explained by an odontogenic cause such as periodontal disease
2. Dull, aching bone pain in the jaw, which may radiate to the temporomandibular joint region.
3. Sinus pain, which may be associated with inflammation and thickening of the maxillary sinus wall.
4. Altered neurosensory function.

Clinical Findings

1. Loosening of teeth not explained by chronic periodontal disease.
2. Intraoral or extraoral swelling.

Radiographic Findings

1. Alveolar bone loss or resorption not attributable to chronic periodontal disease.
2. Changes to trabecular pattern sclerotic bone and no new bone in extraction sockets.
3. Regions of osteosclerosis involving the alveolar bone and/or the surrounding basilar bone.
4. Thickening/obscuring of periodontal ligament (thickening of the lamina dura, sclerosis, and decreased size of the periodontal ligament space).

Whilst 53% of non-exposed osteonecrosis have been reported by Ruggiero et al to progress to bone exposure within 2 years, this was predominantly for patients with malignancy doses of osteoporosis treatments. The progression from stage 0 ONJ in patients on osteoporosis doses of treatment is not known.(2)

Which treatments for osteoporosis are associated with MRONJ?

Antiresorptive treatments including oral bisphosphonates (alendronate, risedronate, Ibandronate), intravenous zoledronate, denosumab and romosozumab. Longer durations of treatment (above 5 years) puts patients in a higher risk category.

The risk of MRONJ and severity is significantly higher for patients using osteoporosis treatment doses as part of cancer treatment. Patients on these higher dose treatments, under the care of an oncologist, require mandatory dental assessments and follow-up.

Are there any additional risk factors to consider?

Additional risk factors include coexistent local periodontal infections, gum disease, chemotherapy, glucocorticosteroid use, smoking, alcohol, diabetes, obesity, anaemia, HIV infection, Sjogren's syndrome, rheumatoid arthritis and local dental issues such as ill-fitting dentures

Should patients stop their osteoporosis medications before undergoing dental procedures?

We do not recommend stopping **oral bisphosphonates** before undergoing dental treatment as there is no evidence this will reduce the risk, and the treatments have a long half-life.

In patients on **intravenous zoledronate** due for infusion, consider delaying the treatment after discussion with the specialist team.

In patients treated with **Denosumab,** consider planning dental procedures in the interval between 3-4 months after the last injections. Denosumab dosing should not be delayed as this results in a rapid loss of bone and, if the patient has received more than 4 doses, the loss of bone is associated with a transient significant increased fracture risk.

What are the key recommendations for reducing risk of MRONJ in patients with osteoporosis?

GP practice teams

- Provide patient information regarding importance of continuing osteoporosis medication and very low risk of dental complications (theros.org.uk is a useful link)
- Support good oral hygiene and advise regular dental checks (https://www.nhs.uk/live-well/healthy-teeth-and-gums/take-care-of-your-teeth-and-gums/) information:
    - Brush teeth twice a day with fluoride toothpaste
    - Floss or use interdental cleaning technique
    - Healthy diet and reducing sugary snacks and drinks
- Encourage patient to see their dentist before starting osteoporosis treatment but do not let this delay initiation of osteoporosis treatment.
- Consider providing the dental practice with the details of their osteoporosis medications if appropriate, e.g. if there is cognitive impairment.
- Where a patient does not have a regular dentist, ask the reception team to signpost them to the NHS website [https://www.nhs.uk/service-search/find-a-dentist]
    - Patients with osteoporosis qualify for BOB ICB flexible commissioning as they have clinical/medical need that requires attendance at a dental practice (see Appendix 2 for participating practices)
- Stop smoking & minimise alcohol intake

GP practice teams specific advice for patients:

- Osteoporosis treatments are important to reduce the risk of fractures
- The risk of dental complications is very low and nearly all patients do not have to change their osteoporosis treatments because of dental issues

- Patients should be made aware of the name of their osteoporosis treatment and date of the last dose
- Patient to report any symptoms such as exposed bone, loose teeth, non-healing sores or lesions, pus or discharge, tingling, numbness or altered sensations, pain or swelling to their dentist to confirm exposed bone to their dentist.
- Do not stop osteoporosis treatments without discussion with their clinical team
- For patients due Denosumab, encourage them to contact their dentist. This is important to enable them to time dental extractions 3-4 months after the last dose so the dental wound is healed by the time of the next injection.

Dental practice teams specific advice for patients:

1. Osteoporosis is a common bone disease that can lead to major fractures and permanent loss of quality of life and increased mortality.
2. Clarify the name, dose of osteoporosis medication and if it is for osteoporosis and not cancer or another condition. For denosumab, identify the date of the next dose.
3. There is no evidence for stopping oral bisphosphonates prior to dental treatment reduces the risk of ONJ.
4. For patients due denosumab, if possible, time level 1 (simple) and 2 extractions 3-4 months after the last dose so the wound is healed by the time of the next injection.
5. In emergency procedures – if possible, open and dress tooth. If not possible discuss risk and benefits with patients – pre and post operative chlorhexidine mouthwashes for level 1 or 2 extractions. If referring as level 3 extraction in Rego, add in text box: **Urgent** and describe risks for **MRONJ**.
6. Dental fitness is important
    a. Preventative – improve oral hygiene, smoking cessation, reduce frequency of sugar intake
    b. Consider removal of retained roots / teeth with poor prognosis
7. Dental Procedures
    a. Fillings, root canal treatment and normal scaling/Professional Mechanical Plaque Removal (PMPR) can proceed. Avoid deep scaling or sub-gingival PMPR.
    b. Simple extractions (level 1) – consider review if there are potential risk factors requiring earlier follow-up (e.g. poor oral hygiene, smoking)
    c. Extractions (level 2) can be performed by specialist tier 2 oral surgery
    d. Avoid complex extractions – (level 3) and refer to local maxilla-facial team.
    e. Once patients have started osteoporosis medications, it would be possible/preferential to retain asymptomatic non-infected roots even if they require RCT.
    f. There is currently insufficient evidence to support the use of antibiotic or topical antiseptic prophylaxis to reduce the risk of MRONJ following extractions or procedures that impact on bone.

g. For Implants /perioral surgery – recommendation is to minimise damage to bone but it should be stated there is no good quality evidence to suggest whether dental implants are safe or not.
h. If socket is not healed by 8 weeks – patient to discuss with dentist to diagnose and refer to level 3 services and complete an MHRA yellow card *https://yellowcard.mhra.gov.uk/*

Hospital teams' specific advice for patients:

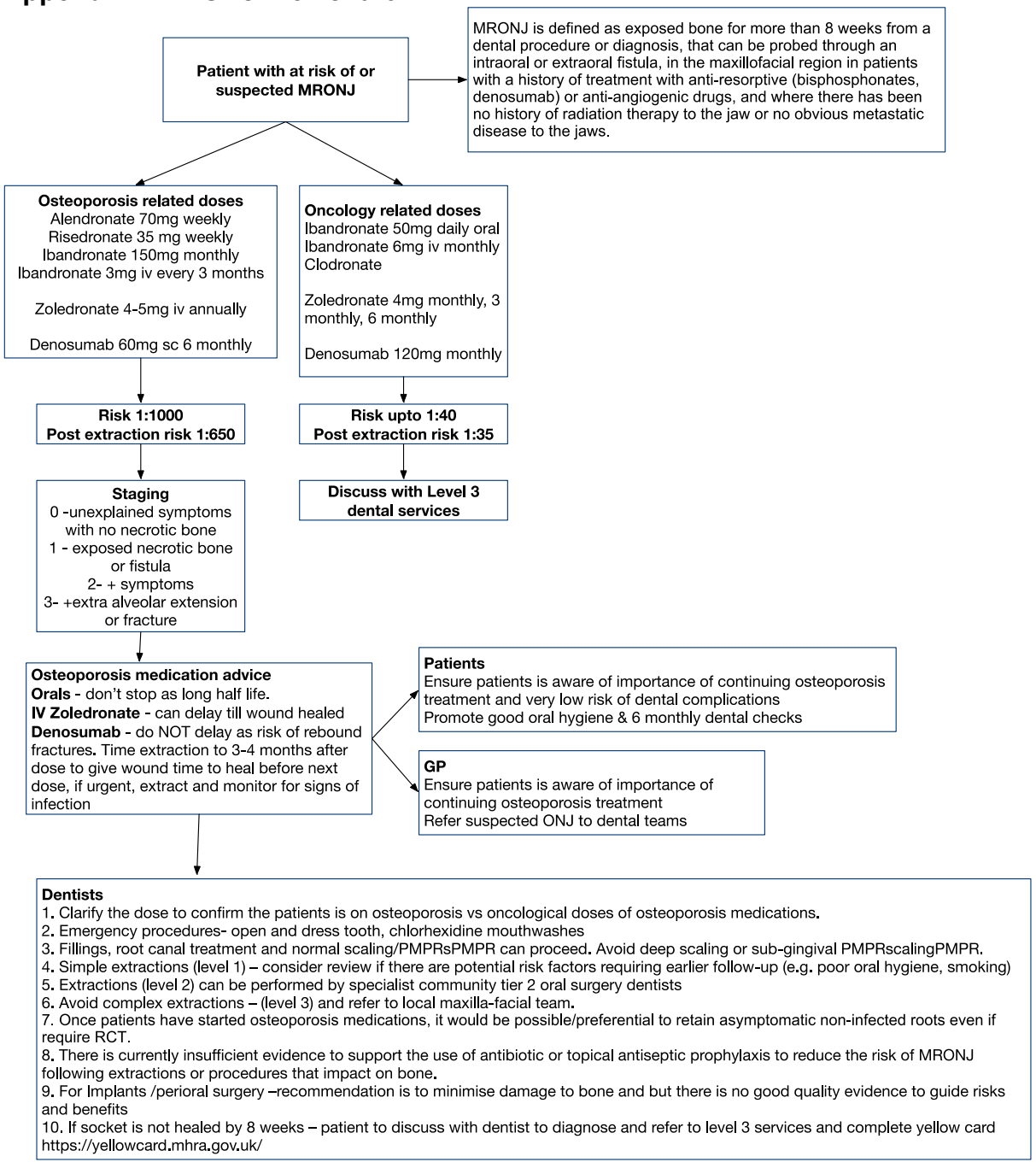
1. Osteoporosis treatments are important to reduce the risk of fractures
2. The risk of osteonecrosis of the jaw is thought to be 1:1000 to 1:10,000.
3. A standard of good oral hygiene should be achieved prior to osteoporosis treatment. Routine dental visits and oral hygiene should be recommended but should not delay starting treatment of osteoporosis if the benefits of treatment outweigh the potential risks of ONJ. The rheumatology team should check for loose teeth or black stumps and either; refer.to general dental services where the patient has a regular dentist or advise the patient to contact a dental practice taking part in the flexible commissioning scheme **(Appendix 2)**
4. Once on treatment, dental surgery is not contraindicated, and atraumatic extractions are recommended reviewing at 1 and 2 weeks with a low threshold for oral antibiotics if infection is suspected.
5. Patient should be advised to report any symptoms such as exposed bone, loose teeth, non-healing sores or lesions, pus or discharge, tingling, numbness or altered sensations, pain or swelling to their dentist to confirm exposed bone to their dentist.
6. Do not stop osteoporosis treatments without discussion with their clinical team
7. For patients due denosumab, encourage them to contact their dentist or contact a flexible commissioning practice. This is important to enable them to time dental extractions 3-4 months after the last dose so the dental wound is healed by the time of the next injection.

Please send any comments on the document to laurie.powell@nihr.ac.uk

References

1. National Institute for Health and Care Excellence (NICE). What are osteoporosis and osteoporotic fractures? [Internet]. Clinical Knowledge Summaries. NICE; 2025 [cited 2025 Jun 1]. Available from: https://cks.nice.org.uk/topics/osteoporosis-prevention-of-fragility-fractures/background-information/definition/#:~:text=Osteoporosis%20is%20defined%20by%20the,reported%20as%20a%20T%2Dscore.
2. Ruggiero SL, Dodson TB, Aghaloo T, Carlson ER, Ward BB, Kademani D. American Association of Oral and Maxillofacial Surgeons' Position Paper on Medication-Related Osteonecrosis of the Jaws—2022 Update. Vol. 80, Journal of Oral and Maxillofacial Surgery. W.B. Saunders; 2022. p. 920–43.
3. Chang YS, Nanayakkara S, Yaacoub A, Cox SC. Prevention of medication-related osteonecrosis of the jaw: institutional insights from a retrospective study. Aust Dent J. 2024;

Appendix 1 MRONJ Flowchart



Appendix 2 BOB ICB Flexible Commissioning Practices

Participating practices listed below.

https://www.bucksoxonberksw.icb.nhs.uk/your-health/dentists/

Some BOB dental practices now provide unscheduled NHS dental care for urgent presentations. Details can be found on the same link as above.