Medical Management of Osteoporosis and Fragility Fractures in Adult Men and Women over 50 years of age

RISK ASSESSMENT

Patients with one or more of the high risk factors listed below should, as a minimum, be assessed using the WHO FRAX® risk assessment tool and the linked National Osteoporosis Guideline Group (NOGG) website. The FRAX® tool has been developed by the World Health Organisation (WHO) to evaluate the 10 year probability of hip fracture and for major osteoporotic fracture (clinical spine, forearm, hip or humerus). It is available at www.shef.ac.uk/FRAX. The risk is calculated using the patient’s height, weight, clinical risk factors with or without bone mineral density (BMD), and is country specific. The FRAX® assessment does not tell you when to treat. For the UK, treatment guidelines are available at www.shef.ac.uk/NOGG or via the link in FRAX®. Since FRAX® is most useful when used in conjunction with BMD, referral to the Trust Osteoporosis (FLS) Assessment Service at Worthing (or at Bognor War Memorial Hospital) should be considered, using the criteria set out on the respective referral forms.

High risk of fracture - require FRAX® if any criteria is present

- Previous history of fragility fracture
- Parental (maternal +/- paternal) history hip fracture < 75 years
- BMI ≤ 19 kg/m²
- Use of glucocorticoids – any dose ≥ 3months
- 3 or more units alcohol per day in women
- Prolonged immobilisation and/or reduced mobility e.g. CVA, Parkinson’s disease, ankylosing spondylitis
- Low gonadal hormone levels e.g.
  - Untreated premature menopause ≤ 45 years
  - Male hypogonadism
  - Chemotherapy for breast or prostate cancer
- Rheumatoid arthritis

Other medical disorders also associated with osteoporosis

- Vitamin D deficiency
- Inflammatory bowel disease e.g. Crohn’s disease or ulcerative colitis
- Malabsorption e.g. coeliac disease
- Anorexia nervosa
- Chronic liver and renal disease
- Organ transplantation
- Type I diabetes
- COPD
- Hyperthyroidism, hyperparathyroidism or hypopituitarism

Moderate risk factors for fracture (only consider assessment if two or more of the following are present)

- Age > 65yr
- Post menopausal women
- Caucasian or Asian origin
- Sedentary lifestyle
- Current smoking
- Drug induced e.g. certain antipsychotics, long term heparin, thyroxine, anticonvulsants; Depoprovera > 2 years treatment; proton pump inhibitors

Consider investigation in people with osteoporosis (especially men, patients with a very low T score or those with multiple vertebral fractures)
- FBC, ESR/CRP (if ESR/CRP raised arrange protein electrophoresis and/or serum light chains / urine Bence-Jones protein)
- U+E s (including eGFR)
- LFTs
- Bone profile
- Testosterone (in men)

It may be necessary to consider the following tests
- TFT/TSH
- 25-hydroxyvitamin D & serum intact PTH
- Coeliac antibody screen
- Lateral thoracic and lumbar spine x-rays if > 5 cm height loss

TREATMENT

General Measures & Lifestyle Factors
- Reduce dose oral glucocorticoids if possible and consider steroid sparing therapy
- Recommend good nutrition (calcium, vitamin D and protein)
- Regular weight bearing exercise
- Refer to physiotherapist for exercise and posture advice as appropriate (especially for patients with vertebral fractures) and provide patients with written information which can be downloaded from: [http://www.nos.org.uk/NetCommunity/Page.aspx?pid=466&srcid=466](http://www.nos.org.uk/NetCommunity/Page.aspx?pid=466&srcid=466)
- Stop smoking and avoid excessive alcohol
- Refer for falls risk assessment, if appropriate
- Hormone Replacement Therapy is only recommended for the prevention of osteoporosis in women with a premature menopause or menopausal symptoms

PHARMACOLOGICAL MANAGEMENT

Calcium + Vitamin D
Adequate levels of calcium and vitamin D are needed to ensure optimal effects of all the osteoporosis treatments. Unless the prescriber is confident that the patient is replete in calcium and vitamin D, calcium 1 g (equivalent to 2.5 g calcium carbonate) and vitamin D 800 iu daily should be prescribed.
This is equivalent to:

<table>
<thead>
<tr>
<th>Chewable tablets</th>
<th>Soluble/Effervescent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adcal D3: one tablet bd (first line), or</td>
<td>Adcal D3 Dissolve: 1 bd</td>
</tr>
<tr>
<td>Calceos: one tablet bd</td>
<td>Cacit D3: 1 sachet bd</td>
</tr>
<tr>
<td>Calci chew D3 forte: one tablet bd</td>
<td>Calfov it D3: 1 sachet daily</td>
</tr>
<tr>
<td>Natecal D3: one tablet bd</td>
<td></td>
</tr>
</tbody>
</table>

- 2 -
Frail elderly patients living in care homes or housebound should be prescribed calcium/Vitamin D3 indefinitely unless contraindicated.

For patients unable to tolerate calcium supplements, consider cholecalciferol (vitamin D3) 1000units daily (but available over the counter/non-prescription only e.g. Sunvit D3).

**First Line Treatment**

**Bisphosphonates** Oral alendronate 70mg weekly is the bisphosphonate of first choice because of its lowest acquisition cost. It should be swallowed whole with a full glass of water at least 30 minutes before the first food or drink of the day. Patients should stand or sit upright for 30 minutes after the dose.

Risedronate (35mg once weekly) is to be prescribed only in patients with steroid-induced osteoporosis, or patients intolerant of alendronate.

Ibandronate (150mg once monthly) may be considered for patients with poor compliance with weekly bisphosphonates.

N.B. Bisphosphonates should be used with caution in patients with renal impairment. Those with an eGFR less than 30ml/min - seek specialist advice.

**Strontium Ranelate** (2g daily) may also be considered as 1st line treatment in those over 80 years old.

**Second Line Treatment**

**Strontium Ranelate** is available as an alternative to alendronate (2nd line). It may also be considered as an alternative for women aged 75-80 years with a previous fragility fracture, when bisphosphonates are contraindicated or cannot be tolerated or the patient has difficulty complying with the regime. Strontium should be taken at bedtime at least 2 hours after eating. It should be avoided in severe renal impairment (e.g. eGFR ≤30ml/min) and used with caution in patients with a history of venous thromboembolism. Strontium also has a patient support programme (Embrace®).

**Denosumab** is a monoclonal antibody used for the prevention of fracture in postmenopausal osteoporosis. It is administered by subcutaneous injection at a dose of 60mg every 6 months. The first two doses are administered in secondary care, with subsequent prescription in primary care. It can be used in patients with renal impairment and like strontium has a patient support programme to improve compliance.

**Intravenous Bisphosphonates** (Pamidronate, Ibandronate + Zolendronate) may be considered in patients who are intolerant of oral medications, including Strontium Ranelate, and/or are unable to comply with the instructions for taking the medications. The strongest evidence is for zolendronate, given as an annual injection for a total of three injections. Assessment by a dentist, and completion of major dental treatment e.g. extractions is recommended prior to treatment with intravenous bisphosphonates. They are administered in secondary care day case facilities.
**Raloxifene** (an alternative 2nd line treatment): For post menopausal women with vertebral osteoporosis with an unsatisfactory response to or intolerance of bisphosphonates, raloxifene may be used for secondary fracture risk reduction. Avoid in severe renal impairment and history of venous thrombosis. There is no evidence of hip fracture reduction with this drug and it is rarely used.

**Third Line Treatment**

**Teriparatide/Parathyroid Hormone** These are for specialist use only, in line with NICE guidance, and are restricted to patients:
- With an unsatisfactory response/intolerance to bisphosphonates
  - and have a BMD T score of -4 SD or below
  - or
- T score -3 SD or below plus 2 or more fractures plus > 1 clinical risk factor

Use with caution in moderate renal impairment. It is contraindicated in severe renal impairment.

An **unsatisfactory response** to treatment is defined as a patient suffering ‘another fragility fracture despite adhering fully to treatment for 12 months (medication possession ratio >80%) and with evidence of a decline in Bone Mineral Density (BMD) below the pre-treatment baseline’.

**Intolerance** is ‘persistent gastrointestinal tract disturbance sufficient to warrant discontinuation’.

**Monitoring Treatment**

Monitoring the response to treatment is controversial. Consider repeating the DEXA scan after 2-3 years of treatment to ensure the BMD is stable or improving. Consider a change in treatment if the BMD is deteriorating or a further fragility fracture has occurred.

Remember, for ALL forms of treatment:

**Review patient within 3 months after initiation of treatment to assess adherence**

**Duration of Treatment**

There is a current lack of evidence on the most appropriate duration of therapy. It is reasonable to treat for 5 years and then review. Teriparatide and parathyroid hormone are now licensed for 24 months. Those patients not at increased risk of vertebral fracture may consider a ‘drug holiday’ of up to 5 years, but continuing on calcium/vitamin D in the interim. Women at very high risk of fragility fracture should consider continuing on treatment indefinitely.
MEDICAL MANAGEMENT OF GLUCOCORTICOID-INDUCED
OSTEOPOROSIS

Consider osteoporosis risk if patients:
  o Have been on or are expected to be on any dose of steroids for ≥3 months. Investigation/treatment should be initiated as soon as possible when steroids are prescribed
  o Have received a cumulate dose of 1500mg of prednisolone per year for patients prescribed repeated short courses. This would equate to approximately 3 courses per year for a patient with COPD.

If patient is:
  o Age ≥65 yr
  or
  Previous fragility fracture

  o Age < 65 with no history of fragility fracture
    Refer for DEXA scan - if T score:
      o 0 to -1.5 SD
        Repeat DXA 2-3 years if steroids continued
      o -1.5 SD or lower – initiate treatment with bisphosphonate + Calcium/Vitamin D3

*Oral alendronate or risedronate. Teriparatide is also licensed for the prevention of corticosteroid-induced osteoporosis.

These guidelines were first developed by the West Sussex Fracture Prevention Forum and should be used in conjunction with those issued by NOGG, NICE and the RCP.

Revised July 2011 Dr A Hepburn