**Algorithm for the medical prevention of glucocorticoid-induced osteoporosis in adults**

**Glucocorticoid therapy expected to be > 3 months or Cumulative dose equivalent to 1.5 gram per year for patients prescribed repeated short courses**

**Aged < 65 years**

- No previous fragility fracture
  - Measure BMD (DXA scan, hip +/- spine)
    - T score above 0
      - Reassure General Measures
    - T score between 0 & -1.5
      - General Measures
    - T score -1.5 or lower
      - Repeat BMD not indicated unless a daily dose of 10mg or more is required

**Aged > 65 years**

- Previous fragility fracture or incident fracture
  - Investigations

**Treatment**

Consider bisphosphonate, alendronate will be first-line choice unless otherwise indicated.

All patients must also be prescribed:
- Calcium 1.2 gram + colecalfirol 20 micrograms (800IU) daily unless clinician is confident patient has adequate calcium intake & is vitamin D replete

Initiate osteoporosis management when glucocorticoid is started & stop treatment six months after glucocorticoids stop.

Advise six monthly review of adherence to therapy by community pharmacist.

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1. **All Patients**
   - FBC, ESR (if ESR raised, measure serum paraproteins & urine Bence Jones protein)
   - Bone & liver function tests (Ca, P, Alk phos, albumin, ALT)
   - Renal function

   Additional tests if indicated:
   - Serum 25 OH Vit D & consider PTH if:
     - Calcium level raised
     - Calcium leave in upper quartile of normal range & vitamin D deficient
   - Serum TSH
   - Serum 25 OH Vit D
   - Lateral thoracic & lumbar spine X rays
   - Serum testosterone, LH & SHBG, PSA (men)
   - BMD if monitoring required
   - Coeliac screen (TTG)

2. **Consider treatment depending on age & fracture probability**

3. **General Measures**
   - Reduce dose of glucocorticoid when possible
   - Consider glucocorticoid sparing therapy if appropriate or consider alternative route of administration
   - Recommend good nutrition esp. with adequate calcium
   - Recommend regular weight bearing exercise
   - Maintain ideal body weight
   - Avoid tobacco use & alcohol abuse (> government recommendations)
   - Assess falls risk & give advice if appropriate
   - Promote adequate vitamin D absorption
### Medical Management of Men & Women Who Have or Are at Risk of Osteoporosis

#### Clinical Risk Factors for Osteoporosis

<table>
<thead>
<tr>
<th>Previous fragility fracture*</th>
<th>Predisposing medical conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current glucocorticoid use &gt; 3 months *</td>
<td>hyperthyroidism</td>
</tr>
<tr>
<td>Parental history of hip fracture*</td>
<td>rheumatoid arthritis</td>
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<tr>
<td>Radiographic osteopenia*</td>
<td>type 1 diabetes</td>
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<tr>
<td>Height loss &gt;5cm*</td>
<td>inflammatory bowel disease</td>
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<tr>
<td>Female hypogonadism:</td>
<td>malabsorption/coeliac disease</td>
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<tr>
<td>- post-menopause</td>
<td>prolonged immobility</td>
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<tr>
<td>- untreated premature menopause</td>
<td>organ transplantation</td>
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<tr>
<td>- drug or surgically induced menopause at &lt;45 years</td>
<td>hyperparathyroidism</td>
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<tr>
<td>- premenopausal amenorrhoea&gt;6 months (excl pregnancy)</td>
<td>chronic liver disease</td>
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<tr>
<td>Body Mass Index (&lt;19kg/m²)</td>
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<tr>
<td>Caucasian/Asian origin</td>
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<tr>
<td>Current smoking</td>
<td></td>
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<tr>
<td>&gt; 3 units alcohol daily</td>
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<tr>
<td>Male hypogonadism***</td>
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</tbody>
</table>

#### Drugs associated with osteoporosis

- excessive levothyroxine replacement therapy
- long-tem heparin
- anticonvulsants
- antipsychotics
- Depo-Provera, > 2 yrs treatment
- Aromatase inhibitors**, GnRH analogues*** (separate guidance)

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* Risk factors that clinically indicate a direct Bone Mineral Density assessment.

** Aromatase inhibitor guidance available as algorithms in Appendix 1 to this guideline¹.

*** The use of GnRH analogues in men is associated with bone loss and fractures but there are no official guidelines to date on its management. Recommend BMD after initiation of therapy (when any additional secondary causes of bone loss are ruled out) and consider bisphosphonate or denosumab therapy for men with osteoporosis and fragility fractures, or men with a T score -2.5 SD or lower. Also consider treatment for men with a T score between -1 and -2.5 SE on GnRH analogues if additional risk factors were present. All should have adequate intake of calcium and be vitamin D replete or be prescribed supplementation and have a follow-up BMD in 1-3 years (based on clinical acumen).

The FRAX tool is an algorithm which calculates fracture risk. (Available at [www.shef.ac.uk/FRAX](http://www.shef.ac.uk/FRAX) & it links to guidance published by the National Osteoporosis Guideline Group. (NOGG³) for the management of osteoporosis).