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# Belinda's back pain

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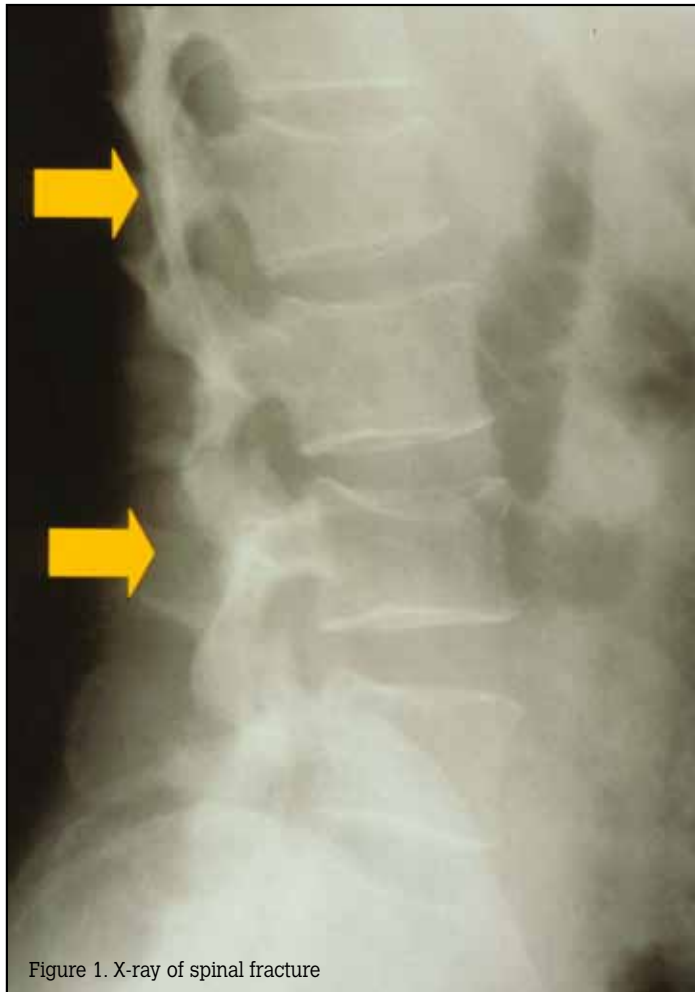


Figure 1. X-ray of spinal fracture

## Case study

Belinda is 37 years of age and presents 2 weeks after the acute onset of severe mid-thoracic pain which occurred as she was lifting her son's pram out of the car boot.

Belinda has had systemic lupus erythematosus (SLE) for 15 years with previous skin, joint and renal involvement. Her SLE is currently controlled by hydroxy

chloroquine 400 mg/day and prednisolone 7.5 mg/day. She does little exercise, enjoys dairy foods, has not menstruated for 4 years and has a body mass index (BMI) of 24 kg/m<sup>2</sup>.

Belinda's mother had a very 'stooped' back. Belinda has no previous history of back pain, trauma, malignancy, systemic or lower limb compressive symptoms.

A lateral chest X-ray shows two mid-thoracic crush fractures (*Figure 1*). Dual energy X-ray absorptiometry shows spinal T-scores and Z-scores of  $-2.9$ .

### Question 1

How would you investigate Belinda's osteoporosis?

### Question 2

How would you manage her back pain?

### Question 3

How would you manage her osteoporosis?

### Question 4

Should you stop her prednisolone?

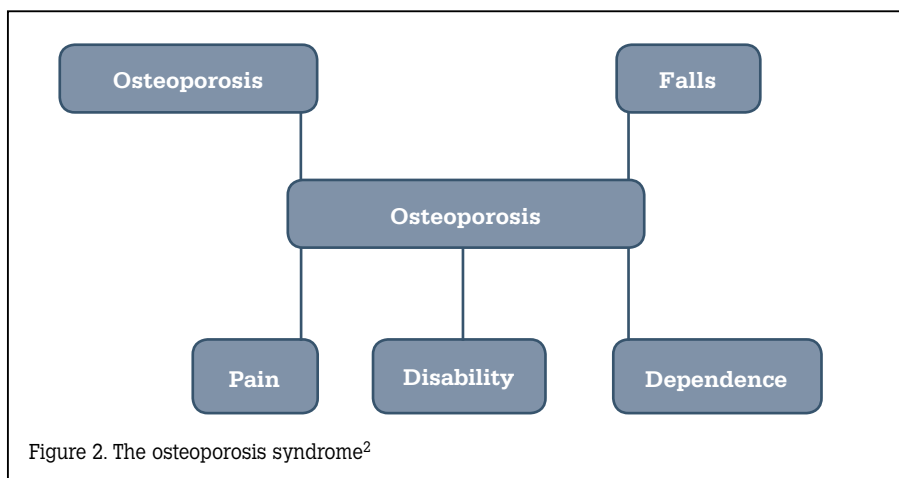
### Question 5

If prednisolone is required, how would you reduce the potential side effects?

### Answer 1

The T-score assesses bone mineral density (BMD) in terms of standard deviations (SD) related to the gender young normal mean and defines osteopenia (T-1 to  $-2.4$ ) and osteoporosis ( $T \leq -2.5$ ).<sup>1,2</sup> The Z-score assesses BMD in terms of SD related to the gender peer age group. Values outside the 95% reference range ( $+2$  SD) suggest a pathological aetiology.

Belinda is young and so the T and Z scores are similar. Her Z-score of  $-2.9$  lies well outside the reference range and is very likely to indicate a secondary cause of osteoporosis.



Belinda's history suggests a genetic link (her mother's likely osteoporosis, thoracic fractures and kyphosis), her hypogonadism (4 years of amenorrhoea) and prednisolone therapy (probably higher than 7.5 mg/day previously).

Other possible contributors include vitamin D deficiency because of low sunlight exposure associated with low activity, and other autoimmune diseases particularly coeliac disease or hyperthyroidism.

Checking 25-hydroxyvitamin D, antitransglutaminase or anti-endothelial antibody and thyroid function tests will confirm or exclude these. Further investigations include measuring plasma calcium (minor primary hyperparathyroidism is often unmasked by hypogonadism) renal and liver function tests.<sup>3</sup>

Some recommend basal measurement of bone turnover (eg. fasting beta cross laps) for comparison with later values to assess the effect of prescribed antiresorptive medications.<sup>4</sup>

### Answer 2

Belinda should be encouraged to 'use it or lose it'. The previous practice of strict bed rest for pain relief is now thought to increase bone loss and slow recovery.

Effective analgesia is important to enable Belinda to keep moving. Often narcotics are necessary and should be used to keep her pain free and not just reserved for 'really bad' pain. Appropriate precautions against constipation should be prescribed (eg. sorbitol and senna). Physical therapy, including hydrotherapy, helps speed rehabilitation.

Calcitonin is effective in treating pain

from acute compression fractures but is not subsidised by the Pharmaceutical Benefits Scheme (PBS).

Vertebroplasty is a procedure where 'cement' is injected under radiographic guidance into the crushed vertebra to restore bone strength and maintain anatomy.<sup>5</sup> This may have a place if pain is difficult to control or persists despite appropriate management. Vertebroplasty risks severe side effects including paraplegia and is rarely required unless crush fractures are associated with malignancy.

### Answer 3

The whole 'osteoporosis syndrome' should be managed (Figure 2)<sup>6</sup> with the overall goal being to maintain mobility and quality of life for as long as possible.

You could review Belinda's medications and consider starting osteoprotective medications and stopping osteolytic and/or ataxiagenic medications (Table 1), particularly reducing her prednisolone.

Belinda has had amenorrhoea for 4 years probably because her hypothalamic pituitary ovarian axis has been suppressed. Oestrogen or raloxifene may be indicated, unless contraindicated by previous thromboembolic events. Bisphosphonate therapy would be subsidised by the PBS because of her fragility fracture. If problems with oral therapy seem likely (eg. dysphagia, history of oesophageal problems) an annual infusion of zoledronate is subsidised for 3 years.

Calcium and vitamin D supplementation are also indicated (800–1200 mg and at least 800–1000 units/day).

Other osteoprotective medications could also be considered and have their own pros and cons (Table 2).<sup>7</sup> Note that both alendronate and risendronate are subsidised by the PBS

Table 1. Osteoporosis – medications to stop or minimise dose as clinically indicated		
<b>Osteolytic</b> <ul style="list-style-type: none"> <li>• Glucocorticoids</li> <li>• GnRH agonists</li> <li>• Laxatives</li> </ul>	<b>Ataxiagenic</b> <ul style="list-style-type: none"> <li>• Psychoactives</li> <li>• Hypotensives</li> <li>• Anticholinergics</li> </ul>	<b>Both</b> <ul style="list-style-type: none"> <li>• Antiepileptics</li> <li>• Loop diuretics</li> </ul>

Table 2. Osteoprotective medications		
Type	Pros	Cons
<ul style="list-style-type: none"> <li>• Bisphosphonates</li> <li>• Raloxifene</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly, monthly or 1 yearly dose</li> <li>• Cancer protection</li> </ul>	<ul style="list-style-type: none"> <li>• Complex administration</li> <li>• Prothrombosis</li> <li>• New medication</li> <li>• Prothrombosis</li> </ul>
<ul style="list-style-type: none"> <li>• Strontium ranelate*</li> <li>• Hormone therapy</li> </ul>	<ul style="list-style-type: none"> <li>• Dual action</li> <li>• Other benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Women: prothrombosis</li> <li>• Men: prostatism</li> <li>• Both: cancer risk</li> </ul>
* In postmenopausal women Note: parathyroid hormone increases BMD and is available on private prescription		

for the prevention of glucocorticoid induced osteoporosis for those with T-scores below  $-1.5$  who are expected to be on  $\geq 7.5$  mg of prednisolone for  $\geq 3$  months.

Hip protectors reduce fracture risk by dissipating the damaging force associated with falls, but many women dislike wearing them and they are more important in older women with high absolute risk of hip fracture.

Advise on appropriate long term analgesia (ideally not nonsteroidal anti-inflammatory drugs [NSAIDs] or narcotics) and consider referral to a physiotherapist or occupational therapist for advice on aids and exercises to maintain mobility and function.

Osteoporosis Australia offers support and information (telephone 1300 556 900).<sup>8</sup>

Monitoring therapy might involve assessing:

- bone turnover (fasting blood for beta cross laps) which responds quickly to therapy (within months)<sup>4</sup>
- adequacy of vitamin D status (25 hydroxyvitamin D3  $>50$  nmol/L)
- adequacy of calcium absorption (24 hour urine calcium excretion or radio labelled calcium absorption)
- BMD (1–2 yearly measurement subsidised by Medicare)
- psychological distress (6–12 monthly K10 questionnaires).

## Answer 4

With any autoimmune inflammatory condition, corticosteroids are often an essential therapeutic tool. Finding the ideal dose can be challenging as doses vary with disease activity. Prescribe the lowest effective dose of corticosteroid for the shortest period of time as there is correlation between corticosteroid dose and side effects. In the absence of active disease activity a cautious graded reduction of steroids may be warranted, eg. reducing 1 mg every 1–2 months. The clinical picture will determine the rate of decrease and the final dose.

## Answer 5

- Bone protection as noted
- Gastrointestinal protection: check for *Helicobacter pylori* and eradicate it if detected; avoid NSAIDs
- Metabolic protection: lifestyle review

to minimise weight gain and maintain muscle mass (a GP Management Plan and Team Care Arrangement will give Belinda access to Medicare Plus items for advice and supervision by a dietician and exercise physiologist); check blood glucose, blood pressure and lipids and intervene appropriately

- Cardiovascular protection as indicated by absolute cardiovascular risk calculation: consider cardioprotective aspirin, possibly in conjunction with gastric acid suppression to minimise the gastrointestinal risk
- Skin protection (particularly if fragile): recommend daily or twice daily moisturiser; limit corticosteroid creams which result in considerable skin fragility; consider recommending protective clothing such as stockings and gloves.

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