Monitoring for Low Bow Mineral Density – Time to Recalibrate?

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GIM Grand Rounds
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Background

Table 1 WHO classification of osteoporosis

<table>
<thead>
<tr>
<th>Bone mineral density*</th>
<th>T score</th>
<th>Prevalence (%)†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;1 SD</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Osteopenia (or low bone mass)</td>
<td>1-2.5 SD</td>
<td>-1 to -2.5</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>≥2.5 SD</td>
<td>≤-2.5</td>
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</tbody>
</table>

*Below the young adult mean.

†In white women older than 50 years.
Screening for Osteoporosis
Recommendation Statement – USPSTF (2011)

The USPSTF recommends screening for osteoporosis in women aged 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors.

But when to get the next DXA?
Rescreening Intervals by risk:
Normal BMD or mild osteopenia: 15 yrs
Moderate osteopenia: 5 yrs
Severe Osteopenia: 1 yr

BACKGROUND
Although bone mineral density (BMD) testing to screen for osteoporosis (BMD T score, –2.50 or lower) is recommended for women 65 years of age or older, there are few data to guide decisions about the interval between BMD tests.
National Osteoporosis Guidelines Group (United Kingdom)
No recommendation

USPSTF
No recommendation

National Institutes of Health Consensus Development Panel on Osteoporosis Prevention, Diagnosis, and Therapy
No recommendation

American College of Rheumatology (Choosing Wisely Campaign)
Don’t routinely repeat DXA scans more often than once every two years.

American Association of Clinical Endocrinologists
Repeat yearly until stable, then every two years
98% of patients have increase in hip BMD within the first three years on alendronate

“Monitoring bone mineral density in postmenopausal women in the first three years after starting a bisphosphonate is unnecessary and may be misleading”
Could we...

Understand the utility of monitoring DXA scans by assessing

(1) clinician rationale for ordering
monitoring DXA and

(2) the treatment changes that
follow among average-risk
women who are receiving
treatment for low BMD
"Due" for a Scan: Examining the Utility of Monitoring Densitometry

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Methods

Population: 1782 patients at UCH, who had more than 1 DXA scan between January 1, 2003, and December 31, 2011

Exclusions: men (n = 120), those receiving medications or with conditions known to cause secondary osteoporosis (n = 580), and women not receiving treatment (n = 533). 549 women receiving treatment for low BMD remained

Reviewed medical records from a random sample of 92 patients. Clinician rationale for ordering monitoring DXA and treatment changes that followed were assessed.

Monitoring DXA defined: any DXA on a patient treated for low BMD, excluding the first scan. All others considered to be screening studies.
Methods

• Reviewed all documentation within 6 months prior to DXA scan or at last clinic visit.
• Quotes from ordering clinician recorded and categorized by topic.
• Changes in treatment following DXA recorded as due to monitoring DXA or due to factors other than monitoring DXA

(1) drug changed because of adverse effects or patient preference, (2) drug changed in setting of stable or significantly increased BMD, or (3) drug stopped in setting of significantly decreased BMD.
Results

• Mean age: 68.4 years, 76% white, and 99% treated with bisphosphonates

• Mean 10-year probability of hip or major osteoporotic fracture by FRAX: 3.5% and 13.3%

• Of 1647 DXAs in 549 patients, mean (SD) number of scans per patient: 3.0 (1.1) \(\text{range, 2-10 scans}\), with mean interval between scans: 2.4 years

• For 92 patients reviewed -> 196 monitoring DXAs

• Mean interval between scans that \textit{did not} lead to a treatment change: 2.1 years. Mean interval between scans that \textit{did} lead to a treatment change: 3.0 years \((P = 0.004)\).
<table>
<thead>
<tr>
<th>Topic</th>
<th>Scans, No. (%) (N = 196)</th>
<th>Representative Quotations from Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Due for repeat</td>
<td>177 (90)</td>
<td>“Eval for efficacy of Fosamax.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Had ‘borderline’ DXA 8 mo ago and was started on treatment. Needs follow-up DXA.”</td>
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<tr>
<td></td>
<td></td>
<td>“Due for a DEXA—last one [3 y ago]. On Actonel without problems.”</td>
</tr>
<tr>
<td>Clinical concern</td>
<td>9 (5)</td>
<td>“History of osteoporosis and displaced olecranon fracture on Actonel.”</td>
</tr>
<tr>
<td>Patient request</td>
<td>4 (2)</td>
<td>“Patient wanted to repeat [DXA] because mother had severe [osteoporosis].”</td>
</tr>
<tr>
<td>Plan pending DXA result</td>
<td>9 (5)</td>
<td>“If improved BMD, stop alendronate.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Patient was advised [of] the importance of repeat DXA and the possibility for treatment with Forteo if [BMD] doesn’t improve.”</td>
</tr>
</tbody>
</table>

Abbreviations: BMD, bone mineral density; DXA, dual-energy x-ray absorptiometry; eval, evaluation.

aData are for 92 patients who underwent medical record review. Treatment for low BMD included alendronate sodium (Fosamax), risedronate sodium (Actonel), ibandronate sodium, pamidronate disodium, zoledronic acid, teriparatide (Forteo), raloxifene hydrochloride, denosumab, calcitonin salmon, hormone replacement therapy, and ergocalciferol (50 000 IU). Rationale could include more than 1 topic. No rationale was found in 4 cases (2%).

bIn all, 196 monitoring DXA scans were performed in the 92 patients reviewed.
Conclusions

• Clinicians order monitoring DXAs out of perception they are “due” and rarely make changes in treatment based on results
• Even when DXA showed significant decrease in BMD, treatment changes uncommon
• Frequency of monitoring DXA reflects adherence to professional guidelines
Conclusions

Clinicians may be uncomfortable changing treatment on the basis of DXA results because:

• Decreases in BMD during treatment do not reliably predict future fracture risk

• Most patients who lose BMD during first year of treatment regain much of that in the following year even if treatment is not changed

• Denosumab and teriparatide are costly and have not demonstrated superiority to bisphosphonates
Some thoughts on ways to move forward

• We can do fewer DXAs – and already are at UCH compared to some guidelines
• Reserve monitoring DXA until just prior to a considered drug holiday - perhaps 3-5 years after treatment start
• Absent new fracture, bisphosphonate treatment might be discontinued after 3-5 years if femoral neck T score is > -2.0
• Recurrent fractures on treatment may require different agent