## Diagnosis

### Review: clinical findings should determine choice of imaging test for patients with low back pain in a primary care setting


**QUESTION:** In patients with low back pain in a primary care setting, what is the diagnostic accuracy of clinical information and imaging?

### Data sources

Studies were identified by searching Medline (January 1966 to September 2001).

### Study selection

Studies were selected if they described the accuracy of plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), or bone scanning in patients with low back pain. Paediatric studies and studies of myelography, discography, and positron emission tomography were excluded.

### Data extraction

Extracted data included diagnostic results and methodological quality.

### Main results

73 studies were included. The estimated diagnostic accuracy of plain radiography, CT, and MRI for herniated disc and cancer are displayed in the table. For vertebral metastatic lesions, plain radiography was less sensitive than other imaging tests. In primary care patients, the presence of a lytic or blastic lesion on plain radiographs had a sensitivity of 60% and a specificity of 99.5% for cancer. For vertebral infection, radiography had low sensitivity; in 1 study, radiography had a sensitivity of 82% and a specificity of 57% for osteomyelitis. Sacroilitis occurs early in ankylosing spondylitis and can be detected by radiography. In 1 study, radiography had 45% sensitivity and 100% specificity for spondylarthropathy. CT is a key spinal imaging test. In a meta analysis, CT showed sensitivities ranging from 70–100%, and specificities ranging from 80–96% for the diagnosis of stenosis. In 1 study, MRI had a sensitivity of 96% and a specificity of 92% for detecting spinal infections. MRI had 81–97% sensitivity and 72–100% specificity for detecting stenosis. Bone scanning has been used to detect occult fractures, infections, or bony metastases. Studies using planar imaging to detect metastases reported estimated sensitivities between 74% and 98% and specificities between 64% and 81%. For detecting infection, bone scanning was sensitive (90%) but modestly specific (78%) in 1 study. In 1 study, bone scanning had a sensitivity of 26% and a specificity of 100% for spondylarthropathy.

### Conclusions

In patients with low back pain in a primary care setting, estimates of the diagnostic accuracy of common imaging tests (plain radiography, computed tomography (CT), magnetic resonance imaging [MRI], and bone scanning) are limited by study biases. For patients with systemic diseases, MRI may have the greatest sensitivity and specificity. For patients with degenerative conditions causing neurological impairment, MRI and CT may have similar accuracy. In the absence of systemic disease or progressive neurological deficits, imaging is usually not required in patients with acute back pain of < 6 weeks’ duration.

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### Table: Estimated diagnostic accuracy of imaging techniques for lumbar spine conditions

<table>
<thead>
<tr>
<th>Imaging techniques</th>
<th>Herniated disc</th>
<th>Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensitivity</td>
<td>Specificity</td>
</tr>
<tr>
<td>Computed tomography</td>
<td>62% to 90%</td>
<td>70% to 87%</td>
</tr>
<tr>
<td>Magnetic resonance imaging</td>
<td>60% to 100%</td>
<td>43% to 97%</td>
</tr>
<tr>
<td>Plain radiography</td>
<td>Data unavailable</td>
<td>60%</td>
</tr>
</tbody>
</table>

*Estimated based on multiple studies included in the review.

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