### Movement diagnosis key tests for lumbar spine
**Adapted from Sahrmann (2002) Chapter 3**

- Systematically apply the tests to the patient
- Compare their movement to normal physiological parameters
- Does it replicate pain?
- If it replicates pain, if corrected does it reduce pain?
- Collate the pattern of directions (flexion, extension, rotation) that cause pain = diagnosis
- Fail the test it becomes their treatment

<table>
<thead>
<tr>
<th>A</th>
<th>Standing</th>
<th>Things to think about....</th>
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</table>
| 1 | Appearance | - Paraspinal muscle bulk?  
- PSIS symmetry +ASIS→PSIS level?  
- Arches? Kypholordotic/flatback/sway back/hinges?  
- Greater trochanter antversion/retroversion? |
| 2 | Alignment | |
| 3 | Forward bend | - Normal parameters?  
- Hip or lumber first?  
- Stiff/hypermobile segments? |
| 4 | Return from forward bend | - Hip movement then hip and Lx spine together?  
- Lx spine then hip? |
| 5 | Side bending (Rotation) | - Hinging?  
- Tx/Lx contribution (should be more Tx -75deg)  
- Can they change it?  
- Can you change it?-hands on |
| 6 | Rotation | - Tx greatest-Lx 18deg L5-S1 most-5deg.  
- Paraspinal difference  
- Pelvic rotation? TFL tightness (stiff into hip E) |
| 7 | Back bending | - Decrease canal in stenosis  
- Tight abdominals (lack of segmental control in lower Lx)  
- Hinge? |
| 8 | Single leg stance | - Rotn of pelvis/Lx of hip abduction?  
- Challenge abductors and abdominals |

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<th>B</th>
<th>Sitting</th>
<th>Things to think about....</th>
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<tbody>
<tr>
<td>1</td>
<td>Alignment</td>
<td>- Weight bearing through IT equally?</td>
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| 2 | Knee extension with dorsiflexion | • Hamstring length  
• Pelvic tilt?  
• Lx rotation?  

| 3 | Hip flexion | • Active v Passive- Joint or muscular control?  
Iliopsoas/rect fem.  

C | Supine | • Any pain? Lordosis present?  

| 1 | Bilat hip and knee passive | • Range/tightness?  

| 2 | Hip flexor length test | • Thomas Test  
• Rect fem-knee bent  
• Iliopsoas-knee straight (passive)  
• Pain?Rotation of pelvis?  
• ASIS levels  

| 3 | Unilat hip and knee flexion passive and active | • Pain? Relief? Lordosis?  
• Rotation of pelvis?  
• Difference in range to active  

| 4 | Hip abduction/lateral rotation in flexion | • Rear or capsule test  
• Rotn at pelvis? Lx?  
• Control?  
• Pain?  

| 5 | Lower abdominal muscle performance | • Graded-multiple levels: failure at one level becomes treatment. A demonstration of these exercises can be found at:  
[http://www.youtube.com/playlist?list=PL98A8CB3D4F3B0EE5](http://www.youtube.com/playlist?list=PL98A8CB3D4F3B0EE5)  

| 6 | Upper abdominal muscle performance (optional) | • Graded crunches  

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<tr>
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<th>SLR active and passive</th>
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<td>Differences in range?</td>
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**D Sidelying**

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<tbody>
<tr>
<td>1</td>
<td>Position</td>
<td>Upper leg adduction with lateral pelvic tilt/flexion of Lx spine? Correct by Abducting leg (towel)</td>
</tr>
</tbody>
</table>
| 2 | Hip lateral rotation and abduction | Clam-range and strength  
Control to EOR and back  
Pelvic tilt? |
| 3 | Hip abduction | Flexion? IR? ER?  
What muscular structures are active? Glut med? TFL? Rect fem? |
| 4 | Hip adduction | Observe bottom hip |

**E Prone**

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| 1 | Position  
(Extension) | Pain?  
Lessen with pillow under pervis? |
| 2 | Knee flexion | Hamstring pull on pelvis  
When in range?  
Rotn in Lx? |
| 3 | Hip rotation | Range?  
Symmetry? |
| 4 | Hip extension  
with knee extension | Hamstring→ Gluts  
Compensation in Lx spine?Rotn? Pain? |
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<th>Quadruped</th>
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</table>
| 5 | Hip extension with knee flexion | • Gluts→Hamstring  
• Compensation in Lx spins? Rotation? Pain? |
| F | Quadruped |  |
| 1 | Alignment | • Preferred position?  
• Can they find neutral?  
• Symptoms? |
| 2 | Rocking backward | • Hip/Spine relative flexibility?  
• Tendency to flex/extend?  
• Symmetry/rotation?  
• "symptoms? |
| 3 | Rocking forward |  |
| 4 | Shoulder flexion | • Rotation of spine?  
• Symptoms? |
| G | Standing back to wall | • Lordosis? |
| 1 | Flatten back | • Can they do it?  
• Pelvic tilt?  
• Pain? |
| 2 | Shoulder flexion | • Change in lordosis?  
• Control? Symptoms? |
| H | Functional tests | • How are they performing?  
• Do they get symptoms?  
• Can they correct?  
• Do symptoms alter? |
<p>| 1 | Rolling |  |
| 2 | Supine to sit |  |
| 3 | Sit to stand |  |
| 4 | Gait |  |
| 5 | Stairs |  |
| 6 | Positions and movement |  |</p>
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<th>that are affected in work/sports</th>
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