

Appendix 1: Movement control impairment tests

1. Waiter's bow: Flexion of the hips in standing without movement (flexion) of lower back
 - Correct: Forward bending of hips without movement of lower back (50°-70° flexion of hips)
 - Not correct: Angle of the hip flexion without lower back movement <50° or flexion occurring in lower back
 2. Posterior tilt of pelvis: Actively done in standing upright position
 - Correct: Actively in upright standing (gluteus activity); keeping thoracic spine in neutral, lumbar spine moves toward flexion
 - Not correct: The pelvis does not tilt or low back moves toward extension .no gluteal activity. compensatory flexion in thorax
 3. Single leg stance: From normal standing position to single leg stance, measurement of lateral movement of umbilicus
 - Correct: The distance of the transfer is equal right and left. Not >2 cm difference between sides
 - Not correct: Lateral transfer of umbilicus >10 cm, difference between sides >2 cm
 4. Sitting knee extension: Sitting upright with corrected lumbar spine, extension of knee without movement of back
 - Correct: Sitting upright with corrected lumbar spine, extension of knee without movement of lower back (30°-50° extension normal)
 - Not correct: Lower back moving in flexion. Patients are not aware of the movement of the back
 - (5a) Rocking backward: Transfer of the pelvis backward (rocking) in a quadruped position keeping back in neutral position
 - Correct: 120° of hip flexion without movement of the lower back by transferring pelvis backward
 - Not correct: Hip flexion causes flexion in lumbar spine
 - (5b) Rocking forward: Transfer of the pelvis forward (rocking) in a quadruped position keeping back in neutral position
 - Correct: Rocking forward without extension of lower back
 - Not correct: Hip movements leads to extension of lower back
 6. Prone lying active knee flexion: Prone position active flexion of knee without movement of the lower back or pelvis
 - Correct: Prone position active flexion of knee without movement of the lower back or pelvis
 - Not correct: Pelvis rotates with knee flexion
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