Appendix 1: core strength exercises with their estimated activation intensities

Display of the activations performed on session 1.

<table>
<thead>
<tr>
<th>Isolated muscle to be tested</th>
<th>Activation test used</th>
</tr>
</thead>
<tbody>
<tr>
<td>m. transversus abdominus</td>
<td>Abdominal drawing in manoever in crook lying</td>
</tr>
<tr>
<td>m. multifidus</td>
<td>Prone posterior pelvic tilting</td>
</tr>
<tr>
<td>mm. gluteus medius &amp; maximus</td>
<td>Prone isolated contraction by squeezing of the buttocks</td>
</tr>
</tbody>
</table>

General therapeutic principles used during these activations:
- Oral feedback on movement by the therapist
- Breathing pattern optimization
- Palpation feedback (assisted by therapist & introspective by participant)
- Symmetry and co-contraction evaluation

Note: These activation exercises were also repeated in sit and while standing.

Display of the primary muscles trained & starting exercises and progressions performed in the core strength protocol.

<table>
<thead>
<tr>
<th>Exercise number</th>
<th>Primary muscle trained</th>
<th>Starting exercise</th>
<th>%MVC activation</th>
<th>Progressions (Activation %MVC)</th>
<th>%MVC activation</th>
</tr>
</thead>
</table>
| 1               | m. gluteus maximus     | Glute bridge                     | 17°             | 1. Quadruped hip extension with knee extended  
2. Unilateral glute bridge  
3. Unilateral squat & wall squat | 1. 28°  
2. 35°  
3. 57 & 86° |
| 2               | m. gluteus medius      | Resistance band glute clam       | 47°             | 1. Resistance band side lying hip abduction                                                  | 1. 81°         |
| 3               | mm. multifidi & m. erector spinae (lumbar part) | Lying diagonal extension        | 36 & 46°        | 1. Prone extension on bosuball  
2. Lying superman extension  
3. Weighted superman extension | 1. 56 & 50°  
2. 81 & 77° |
| 4               | m. rectus abdominus    | Adapted knee plank (with posterior tilt) | >27°            | 1. Adapted whole body plank  
2. Long lever whole body plank | 1. 54°,10°  
2. >100°          |
| 5               | mm. obliqui            | Adapted knee side plank          | 37              | 1. Whole body side plank                                                                  | 1. 69°         |
| 6               | m. erector spinae (thoracic part) | Elastic band shoulder retraction with hip hinge | No data         | 1. Resistance pulley shoulder retraction with hip hinge                                     | 1. 60°         |
Progression of exercises when 60% MVC is reached

Participants were trained to achieve the exercises with a minimal MVC of >60% as soon as possible. Thereafter, exercises were made more difficult intrinsically by:
1. Increasing the static hold time from ten to twelve seconds
2. Increasing the body weight bearing (e.g. full plank position instead of kneeling position)
3. Using different kinds of elastic resistance bands (e.g. clam exercise)
4. Performing unilateral positions (e.g. unilateral bridge exercise)
5. Adding additional weights (e.g. weight supported superman exercise)
References