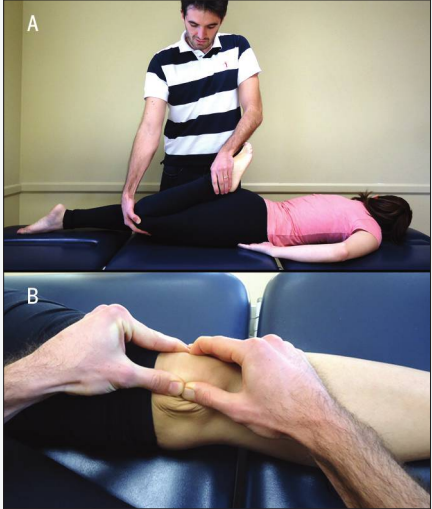
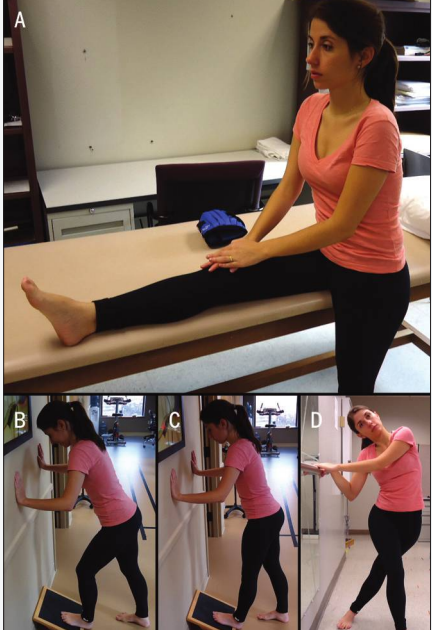


## APPENDIX A

### TREATMENT PROTOCOL PERFORMED BY THE SUBJECTS IN THE STANDARD TRAINING GROUP

Exercise/Progression	Description	Illustration
<p>Quadriceps (A) and lateral retinaculum (B) stretches</p> <p>Weeks 1 to 8</p>	<ul style="list-style-type: none"> <li>• These stretches were assisted by the therapist</li> <li>• 3 sets of 30 seconds</li> <li>• Performed with maximum range of motion that the subjects could tolerate</li> </ul>	
<p>Hamstrings (A), soleus (B), gastrocnemius (C), and iliotibial band (D) stretches</p> <p>Weeks 1 to 8</p>	<ul style="list-style-type: none"> <li>• These stretches were performed individually</li> <li>• 3 sets of 30 seconds</li> <li>• Performed with maximum range of motion that the subjects could tolerate</li> </ul>	

# [ RESEARCH REPORT ]

## APPENDIX A

### Exercise/Progression

### Description

### Illustration

Straight leg raise in supine

Weeks 1 to 2

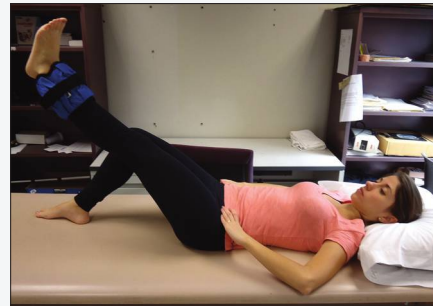
- 2 sets of 20 repetitions
- Resistance: ankle weights
- Initial load: 50% of 1RM
- Exercise progression: increasing 0.5 kg

Weeks 3 to 5

- 3 sets of 12 repetitions
- Initial load: 75% of 1RM
- Exercise progression: increasing 0.5 kg

Weeks 6 to 8

- As in weeks 3 to 5



Seated knee extension (90°-45° of knee flexion)

Weeks 1 to 2

- 2 sets of 20 repetitions
- Resistance: weight-training device
- Initial load: 50% of 1RM
- Exercise progression: increasing 2 to 5 kg

Weeks 3 to 5

- 3 sets of 12 repetitions
- Initial load: 75% of 1RM
- Exercise progression: increasing 2 to 5 kg

Weeks 6 to 8

- As in weeks 3 to 5



Leg press (0°-45° of knee flexion)

Weeks 1 to 2

- 2 sets of 20 repetitions
- Resistance: weight-training device
- Initial load: 50% of 1RM
- Exercise progression: increasing 5 to 10 kg

Weeks 3 to 5

- 3 sets of 12 repetitions
- Initial load: 75% of 1RM
- Exercise progression: increasing 5 to 10 kg

Weeks 6 to 8

- As in weeks 3 to 5



Wall squat (0°-60° of knee flexion)

Weeks 1 to 2

- 2 sets of 20 repetitions, with 5-second isometric contraction
- Exercise progression: increasing 2-second hold

Weeks 3 to 5

- 3 sets of 12 repetitions, with 10-second isometric contraction
- Resistance: holding weights
- Initial load: 10% of body mass
- Exercise progression: increasing 5% of body mass

Weeks 6 to 8

- As in weeks 3 to 5



## APPENDIX A

### Exercise/Progression

### Description

### Illustration

Step-ups and step-downs from a 20-cm step

Weeks 1 to 2  
Weeks 3 to 5

- Not performed
- 3 sets of 12 repetitions
- Resistance: holding weights
- Initial load: 10% of body mass
- Exercise progression: increasing 5% of body mass

Weeks 6 to 8

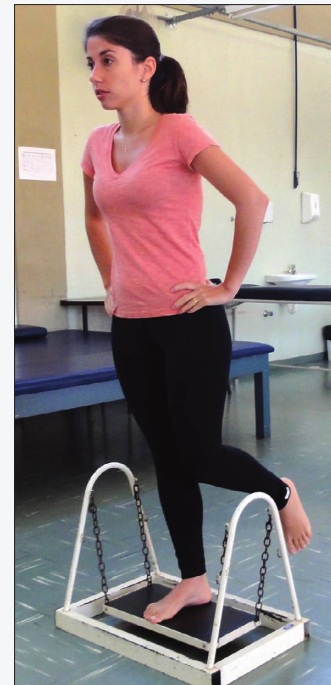
- As in weeks 3 to 5



Single-leg standing on unstable platform

Weeks 1 to 2  
Weeks 3 to 5  
Weeks 6 to 8

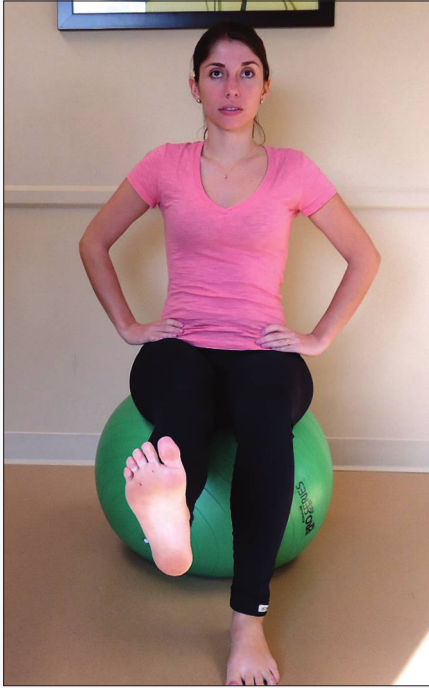

- Not performed
- Not performed
- 3 sets of 30 seconds
- Exercise progression: eyes opened to eyes closed



Abbreviation: 1RM, 1-repetition maximum.

## APPENDIX B

### TREATMENT PROTOCOL PERFORMED BY THE SUBJECTS IN THE FUNCTIONAL STABILIZATION TRAINING GROUP

Exercise/Progression	Description	Illustration
<p>Transversus abdominis and multifidus muscle training</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• Quadruped and prone (not shown): 2 sets of 15 repetitions, with 10-second isometric cocontraction</li> <li>• Sitting on the Swiss ball: 5 repetitions with 20-second isometric cocontraction</li> <li>• Exercise progression: increasing 5-second hold</li> <li>• Not performed</li> <li>• Not performed</li> </ul>	
<p>Lateral bridge (A) and ventral (B) bridge</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• Not performed</li> <li>• 5 sets of 30 seconds</li> <li>• Exercise progression: increasing 5-second hold</li> <li>• Exercises performed with knee support (not shown)</li> <li>• 5 sets of 45 to 60 seconds</li> <li>• Exercise progression: increasing 5-second hold</li> <li>• Exercises performed with foot support</li> </ul>	

## APPENDIX B

### Exercise/Progression

### Description

### Illustration

Trunk extension on the Swiss ball

Weeks 1 to 2

Weeks 3 to 5

Weeks 6 to 8

- Not performed
- 3 sets of 12 repetitions
- Exercise progression: increasing 2 repetitions
- Performed with the arms crossing the thorax (not shown)
- 3 sets of 12 repetitions
- Exercise progression: increasing 2 repetitions
- Performed with the hands behind the neck



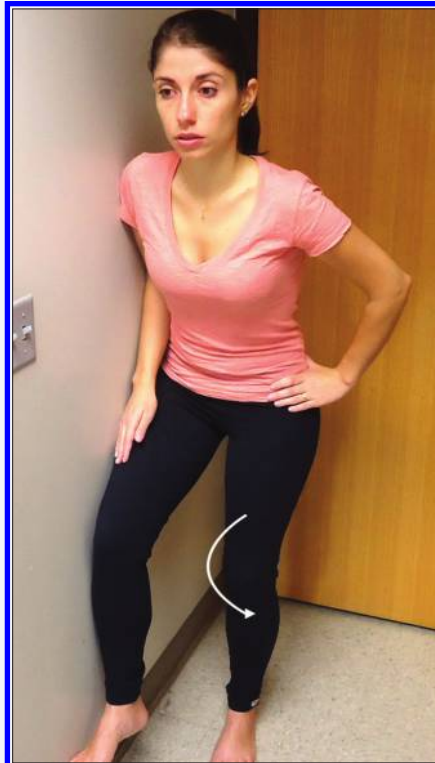
Isometric hip abduction/lateral rotation in standing

Weeks 1 to 2

Weeks 3 to 5

Weeks 6 to 8

- 2 sets of 20 repetitions, with 5-second isometric contraction
- Exercise progression: increasing 2-second hold
- Hip flexion and forward trunk lean were emphasized
- Not performed
- Not performed



Hip abduction/lateral rotation/extension in sidelying

Weeks 1 to 2

Weeks 3 to 5




Weeks 6 to 8

- 2 sets of 20 repetitions, with 5-second isometric contraction
- Resistance: ankle weight
- Initial load: 20% of 1RM
- Exercise progression: increasing 0.5 kg
- 3 sets of 12 repetitions
- Initial load: 75% of 1RM
- Exercise progression: increasing 0.5 kg
- As in weeks 3 to 5





## APPENDIX B

Exercise/Progression	Description	Illustration
<p>Hip extension/lateral rotation in prone</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• 2 sets of 20 repetitions, with 5-second isometric contraction</li> <li>• Resistance: ankle weight</li> <li>• Initial load: 20% of 1RM</li> <li>• Exercise performed with the knee at 90° of knee flexion (not shown)</li> <li>• Exercise progression: increasing 0.5 kg</li> <li>• 3 sets of 12 repetitions</li> <li>• Initial load: 75% of 1RM</li> <li>• Exercise progression: increasing 0.5 kg</li> <li>• As in weeks 3 to 5</li> </ul>	
<p>Hip abduction/lateral rotation with slight knee and hip flexion in sidelying</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• 2 sets of 20 repetitions, with 5-second isometric contraction</li> <li>• Resistance: elastic band</li> <li>• Initial load: 2 elastic resistance levels lower than the 1RM</li> <li>• Exercise progression: increasing 1 elastic resistance level</li> <li>• 3 sets of 12 repetitions</li> <li>• Initial load: 1 elastic resistance level lower than the 1RM</li> <li>• Exercise progression: increasing 1 elastic resistance level</li> <li>• As in weeks 3 to 5</li> </ul>	
<p>Pelvic drop in standing</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• Not performed</li> <li>• 3 sets of 12 repetitions</li> <li>• Resistance: ankle weight</li> <li>• Initial load: 75% of 1RM</li> <li>• Exercise progression: increasing 1 to 2 kg</li> <li>• As in weeks 3 to 5</li> </ul>	

## APPENDIX B

### Exercise/Progression

### Description

### Illustration

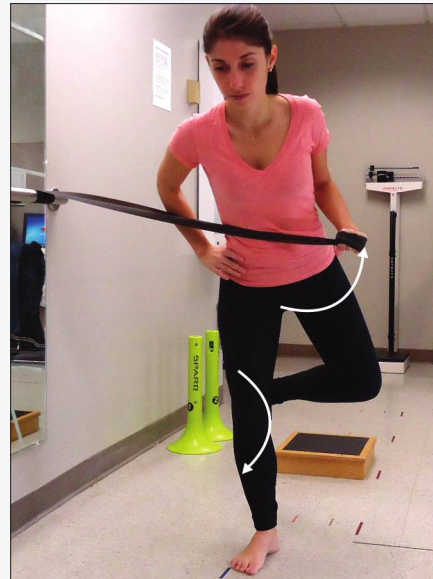
Hip lateral rotation in closed kinetic chain

Weeks 1 to 2

Weeks 3 to 5

Weeks 6 to 8

- Not performed
- 3 sets of 12 repetitions
- Resistance: elastic band
- Initial load: 1 elastic resistance level lower than the 1RM
- Exercise progression: increasing 1 elastic resistance level
- As in weeks 3 to 5



Single-leg deadlift

Weeks 1 to 2

Weeks 3 to 5

Weeks 6 to 8

- Not performed
- 3 sets of 12 repetitions
- Resistance: elastic band
- Initial load: 1 elastic resistance level lower than the 1RM
- Exercise progression: increasing 1 elastic resistance level
- As in weeks 3 to 5
- Exercise performed in front of the mirror with elastic resistance around the knee of the support limb to encourage hip abduction and lateral rotation



Single-leg squat

Weeks 1 to 2

Weeks 3 to 5





Weeks 6 to 8

- Not performed
- Not performed
- 3 sets of 12 repetitions
- No load
- Exercise performed in front of the mirror with elastic resistance around the knee of the support limb to encourage hip abduction and lateral rotation
- Hip flexion and forward trunk lean were emphasized



# [ RESEARCH REPORT ]

## APPENDIX B

Exercise/Progression	Description	Illustration
<p>Forward lunge</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• Not performed</li> <li>• Not performed</li> <li>• 3 sets of 12 repetitions</li> <li>• No load</li> <li>• Exercise performed in front of the mirror with elastic resistance around the knee of the anterior limb to encourage hip abduction and lateral rotation</li> <li>• Hip flexion and forward trunk lean were emphasized</li> </ul>	
<p>Prone knee flexion</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• 2 sets of 20 repetitions</li> <li>• Resistance: weight-training device</li> <li>• Initial load: 50% of 1RM</li> <li>• Exercise progression: increasing 1 to 2 kg</li> <li>• 3 sets of 12 repetitions</li> <li>• Initial load: 75% of 1RM</li> <li>• Exercise progression: increasing 1 to 2 kg</li> <li>• As in weeks 3 to 5</li> </ul>	
<p>Seated knee extension (90°-45° of knee flexion)</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• 2 sets of 20 repetitions</li> <li>• Resistance: weight-training device</li> <li>• Initial load: 50% of 1RM</li> <li>• Exercise progression: increasing 2 to 5 kg</li> <li>• 3 sets of 12 repetitions</li> <li>• Initial load: 75% of 1RM</li> <li>• Exercise progression: increasing 2 to 5 kg</li> <li>• As in weeks 3 to 5</li> </ul>	
<p>Single-leg standing on unstable platform</p> <p>Weeks 1 to 2</p> <p>Weeks 3 to 5</p> <p>Weeks 6 to 8</p>	<ul style="list-style-type: none"> <li>• 3 sets of 30 seconds</li> <li>• Hip flexion and forward trunk lean were emphasized</li> <li>• Transversus abdominis and multifidus muscle cocontraction</li> <li>• As in weeks 1 to 2</li> <li>• External perturbation with medicine ball emphasizing eccentric hip abductor and lateral rotator muscle contraction</li> <li>• As in weeks 3 to 5</li> </ul>	

Abbreviation: 1RM, 1-repetition maximum.



This article has been cited by:

1. Rodrigo Scattone Silva, Fábio Viadanna Serrão. 2014. Sex differences in trunk, pelvis, hip and knee kinematics and eccentric hip torque in adolescents. *Clinical Biomechanics* . [[CrossRef](#)]