






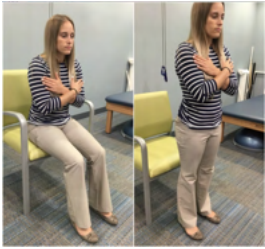




## Knee OA Exercise Prescription

Exercise	Purpose	Description	Cues	Compensations
<p><b>Short Arc Knee Extension<sup>1</sup></b></p> 	<p>Strengthen the quadriceps muscle to help with improving knee extension, weight bearing, and functional movements.</p>	<p>In supine, place a bolster (folded pillow or rolled towel) under the knee of the affected extremity. Push the knee down into the bolster by contracting the quadricep muscle in order to extend the leg and lift the heel off the table.</p> <p>5-10 second holds</p>	<ul style="list-style-type: none"> <li>• Press the knee down into the bolster</li> <li>• Squeeze the quadricep muscle (can provide tactile cue over the thigh)</li> <li>• Keep the motion controlled</li> </ul>	<p>Pt may swing the leg rather than performing a controlled movement</p>
<p style="text-align: center;"><b><u>Regression:</u></b></p> <p><b>Quad Set</b> (Isometric quadricep strengthening)</p> <p>The pt should be positioned in long sitting, or in sitting with the affected extremity extended. Using the quadricep muscle, actively extend the knee. Cue the pt to push the knee down into the table, or into a rolled towel under the knee. PT can provide tactile cues over the quadricep muscle and along the posterior knee.</p> 			<p style="text-align: center;"><b><u>Progression(s):</u></b></p> <p><b>Short Arc Knee Extension w/ increased load<sup>1</sup></b></p> <ul style="list-style-type: none"> <li>• Perform the exercise as described above but add an ankle weight around the affected/moving leg. Increase load as appropriate.</li> </ul> <p><b>Long Arc Knee Extension<sup>2</sup></b></p> <p>Sit with both knees in 90° of flexion over the edge of a chair or stable surface. Squeeze the quadriceps muscle and extend the knee of the affected extremity. 10 second holds</p>  <p><b>Straight Leg Raise<sup>1</sup></b></p> <p>Lie supine and bend the unaffected knee with the foot flat on the surface. Then contract the quadricep of the affected extremity to extend the knee and raise the leg (5 -10 second hold). Then bring the leg back down. Do not swing the leg up and down. This exercise should be performed with control.</p> 	

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<p><b>Side-lying hip Abduction</b><sup>1-3</sup></p> 	<p>Strengthen the hip abductor muscles (GMed)</p>	<p>Pt positioned in side-lying, with the bottom leg bent to increase stability. Keep the top leg in knee extension and slowly raise it up towards the sky (~45°) and then lower it back down. Toes should be pointed forward throughout. 10 second holds</p>	<ul style="list-style-type: none"> <li>• Keep the trunk in line with legs; do not let hips roll forward or backward.</li> <li>• Do not arch the back</li> <li>• Want to feel this exercise in the posterior-lateral hip musculature</li> </ul>	<p>Rotating the entire trunk Bringing leg forward into hip flexion rather than keeping it in line with the hip</p>
<p style="text-align: center;"><b><u>Regression:</u></b></p> <p><b>Seated Hip Abduction</b> (if the pt is unable to perform the exercise in side-lying due to contralateral hip pathology)</p> <p>Sit in a chair with both feet touching the floor. Move both legs outward in a direction parallel to the floor, and then bring them back in while maintaining feet to ground contact. Maintain upright posture throughout exercise.</p> <ul style="list-style-type: none"> <li>• <b><u>Progress:</u></b> Add a looped resistance band around distal thighs. Increase resistance as appropriate</li> </ul> 			<p style="text-align: center;"><b><u>Progression(s):</u></b></p> <p><b>Standing Hip Abduction</b> (If the pt is able to perform the exercise is weight-bearing)</p> <p>Stand next to a chair or counter for balance and support. Raise the leg, contralateral to the side that the chair is on, while keeping the knee in extension and then lower it back down. Remain upright and do not lean laterally over the stationary leg so that the GMed can work effectively.</p> <ul style="list-style-type: none"> <li>• <b><u>Progress:</u></b> Add ankle weight to the moving leg or a looped resistance band around both ankles. Increase resistance/load as appropriate</li> </ul> 	

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<p><b>Sit-to-stand<sup>4</sup></b></p> 	<p>Improve quadriceps strength, as this muscular weakness is a common finding in individuals with knee OA.</p> <p>Improve functional performance and mechanics with transfers such as standing up from and sitting down on a chair, bed, toilet, etc.</p> <p>Improve weight bearing through affected leg</p>	<p>Sit in a standard chair (~18" height), place both feet flat on the floor, and cross both arms across the chest. Without using your hands, stand up fully and sit back down.</p>	<ul style="list-style-type: none"> <li>• Place weight through heels</li> <li>• Encourage equal weight through both feet</li> <li>• Keep the chest up</li> <li>• Scoot forward in the chair so that the pt's feet are posterior to their knees</li> <li>• Lean forward, bringing the nose over the toes when standing up</li> </ul>	<p>Moving the foot of the uninvolved extremity back. This causes a greater load through the uninvolved extremity, rather than putting equal weight through both limbs.</p>
<p style="text-align: center;"><b><u>Regression:</u></b></p> <p><b>Sit-to-stand from elevated surface</b> (Use a taller chair or add an airex pad, pillow, or book on top of the seat):</p> <p>Perform sit-to-stand exercise by sitting on an elevated surface. Without using your hands to assist, stand up fully by placing equal weight through feet. Then sit back down.</p> <p>*Cues similar to those provided for a traditional sit-to-stand.</p> 			<p style="text-align: center;"><b><u>Progression(s):</u></b></p> <p><b>Variations of sit-to-stands</b> (change seat height/feet position to increase load on the quadriceps):</p> <ol style="list-style-type: none"> <li>1. Standard height chair with feet askew</li> <li>2. Lower height surface with feet side-by-side &amp; shoulder-width apart</li> <li>3. Lower height surface with feet askew</li> </ol> <p><b>Chair Squats</b></p> <p>Stand in front of a chair. With arms out in front and feet shoulder width apart, bend forward at the hips and perform the downward motion of "sitting" on the chair. Pt should only tap their bottom on the chair and then return to standing by pushing feet into the ground</p> 	

## References:

1. Singh S, Pattnaik M, Mohanty P, Ganesh GS. Effectiveness of hip abductor strengthening on health status, strength, endurance and six minute walk test in participants with medial compartment symptomatic knee osteoarthritis. *J Back Musculoskelet Rehabil.* 2016;29(1):65-75. doi:10.3233/BMR-150599
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4. Al Amer HS, Sabbahi MA, Alrowayeh HN, Bryan WJ, Olson SL. Electromyographic activity of quadriceps muscle during sit-to-stand in patients with unilateral knee osteoarthritis. *BMC Res Notes.* 2018;11(1):356. Published 2018 Jun 5. doi:10.1186/s13104-018-3464-9

## Images:

- HEP2go - Build a HEP < Home Exercise Program> For Free. Accessed April 8, 2023. [https://www.hep2go.com/exercise\\_editor.php?exId=49444&userRef=gciaake](https://www.hep2go.com/exercise_editor.php?exId=49444&userRef=gciaake)
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