

VMO EXERCISES

Vastus medialis exercises are a great way to improve knee stability and function, reduce knee pain and reduce the risk of cartilage injuries.

- Most people who suffer from long term knee pain have a weak vastus medialis muscle.
- This alters the way the knee moves, how the forces are directed through the knee and places excess strain on the inner knee.
- The great news is that vastus medialis strengthening exercises can easily be done at home or in the gym without the need for specialist equipment.

• Origin & Insertion

- The vastus medialis muscle has an extensive origin on the anteromedial surface of the femur (thigh bone) which begins at lower medial end of the intertrochanteric line, runs down around the medial aspect of the spiral line and the medial lip of the linea aspera.
- It continues on to the upper two thirds of the medial supracondylar line, medial intermuscular septum and the adductor magnus tendon.
- The upper fibres, often referred to as Vastus Medialis longus, mainly pass straight downwards whereas the lower fibres, often referred to as Vastus Medialis Oblique, pass forwards, almost horizontally.
- The muscle fibres join with one of the other quadriceps muscles, rectus femoris, the medial border of the kneecap and the medial condyle of the tibia, fusing with the deep fascia and replacing the lateral joint capsule.

• Vastus Medialis Function

- Vastus Medialis works with the other quadriceps muscles to straighten the knee. It is particularly important as it helps the knee joint to lock in the final stages of knee extension as the femur rotates medially.

- The portion of muscle just above the kneecap is often referred to as vastus medialis oblique or VMO. There is some debate as to whether the VMO is anatomically and functionally distinct from the rest of the muscle or just a part of the muscle.
- The VMO plays an important role in stability particularly of the kneecap by resisting the tendency for the patella to move laterally (outwards) due to the femoral angulation and reducing the risk of kneecap dislocation.
- In some cases, usually following an injury or due to biomechanics, vastus medialis oblique can become weak, fatigued, mis-fire or switch off altogether. This can lead to problems with patella tracking (how the kneecap moves) and anterior knee pain such as patellofemoral pain syndrome.
- Vastus Medialis as a whole works with the other quadriceps muscles to straighten the knee, all working strongly through their entire range. They work in activities such as standing up from a seated or kneeling position, going up and down stairs, cycling and squatting.
- Weakness in the vastus medialis muscle can lead to a whole host of knee problems including:
 - Patellofemoral Pain Syndrome: aka Runners Knee. Causes front knee pain
 - Quadriceps Tendonitis: Causes pain and swelling above the knee
 - Patellar Tendonitis: Causes pain and swelling below the knee
 - Chondromalacia Patella: Causes anterior knee pain
 - Knee Bursitis: Can cause pain and pockets of swelling anywhere around the knee depending on which bursa is affected.

1. VMO Activation

- Sit upright in a chair, with your knees bent, ball between your knees and your feet flat on the floor. Place your thumbs on the soft, squashy area on the inner side of the knee, just above your kneecaps and press down firmly

- Clench your glutes and gently squeeze the ball, making sure the movement comes from your knee rather than the inner thigh. You should feel a tightening or swelling underneath your thumbs which shows you that you are activating vastus medialis and the VMO. That's the area we want to make sure is working with all the exercises. If you can't feel it, try clenching your buttocks, clenching your knees and squashing the backs of your thighs down into the chair.

- Test both sides together, particularly if you have knee pain or swelling, as you may well notice a difference between sides.

2. Ball Clench Extensions

- Lie on your back with a rolled up towel underneath your knees and place the ball between your knees.
- Clench your buttocks and gently squeeze the ball, then lift one heel off the ground until the knee is straight.
- Keep clenching the ball and hold for 3 seconds then slowly lower the foot back down.
- Repeat 10 times, gradually increasing the number of reps as you get stronger, aiming to get up to 25.

Vastus Medialis Summary

- Muscle Group: Vastus Medialis muscle is part of the Quadriceps.
- Action: Extends (straightens) the knee.
- Origin: Large portion of the anteromedial aspect of the femur.
- Insertion: Medial border of the patella (joins with the other quads tendons), medial condyle of the tibia and the tibial tuberosity via the patella tendon.
- Nerve Supply: Femoral nerve (L2, L3, L4).
- Special Function: Knee and kneecap stability especially in the final stage of

knee extension

- AKA: Vastus Internus, Vastus Medialis Oblique, VMO, teardrop muscle
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