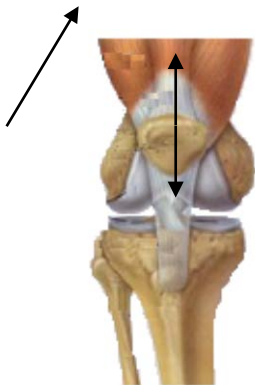
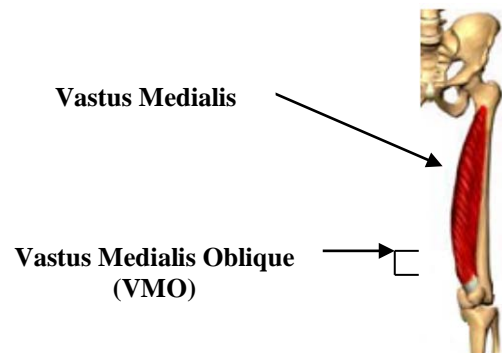


## PATIENT INFORMATION

### WHAT ARE “VMO” EXERCISES?

“VMO” stands for the *Vastus Medialis Oblique* muscle. It is part of the large muscle group that sits on the front of the thigh – the quadriceps or “quads”. The VMO runs along the inside for your leg, just above the knee. The action of the VMO is very important in walking, running and any weightbearing activity that involves bending of the knee.



As your knee bends and straightens, the patella (knee cap) slides up and down over the end of the thigh bone, or femur. Muscles on either side of the patella contract to help guide this movement. The muscles on the outside edge of the patella pull it towards the outside of the leg. To balance this movement, *the VMO muscle pulls the patella towards the inside of the leg.*

Normally, the actions of these muscles are precisely coordinated so that the patella glides smoothly up and down over the femur. But sometimes this coordination is disrupted and the patella gets pulled too far towards the outside of the leg. This may be due to:

- The pain and swelling of a knee injury causing the VMO to weaken
- Tight muscles and tendons on the outside edge of the patella
- Abnormal hip and foot movements – “poor biomechanics”
- An unusually shaped patella or femur.

When the patella gets pulled in this way it rubs against the surface of the femur – creating pain and swelling around the knee. This then develops into a “vicious circle” in which pain and swelling causes further weakening of the VMO and so on....

In order to prevent or treat this problem, the VMO must be strengthened so as to restore the normal movement of the patella. Specific exercises are needed to not only increase the strength and size of the muscle, but to also to develop good coordination with other parts of the quads muscle.

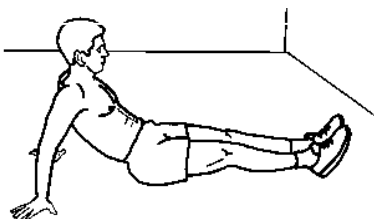
## THE EXERCISES

Below is a progress of VMO exercises – from easiest to hardest. When performing these exercises you should:

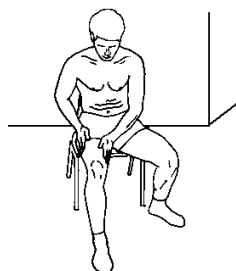
- **concentrate** on contracting the VMO first, before the rest of the quads.
- **feel** the muscle action with you hand for Numbers 1 and 2. For 3 to 6, try to **feel** the contraction within your leg.
- **hold** the contraction for up to 10 seconds, to develop control and endurance.
- **respect** pain – if you experience pain, then try to reduce the intensity of effort a little, or revert to the previous pain free exercise that you have done.

Your physiotherapist can provide you with detailed instructions on how to perform these exercises and which level of exercise is appropriate for you. Some guidance or assistance is often needed initially to develop this very specific muscle action. But above all, be patient – the changes produced by these exercises take time...

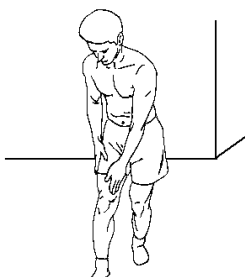
1. On a bed/bench



2.  sitting on the floor



3. Step - standing



4. Squatting



5. Single leg squat



6. Step down

