

Recipe for hard-core glide...

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I am sure you have heard many people talk about core strength and stabilizers, or just throw the Vastus Medialis (VMO) and Glutes in a conversation. But what exactly do you need to know about them? Is it worth hitting the gym to work on your strength 3 times a week when your sport is mainly cardio? Can it really improve your skiing? Read on to find out.

The lingo

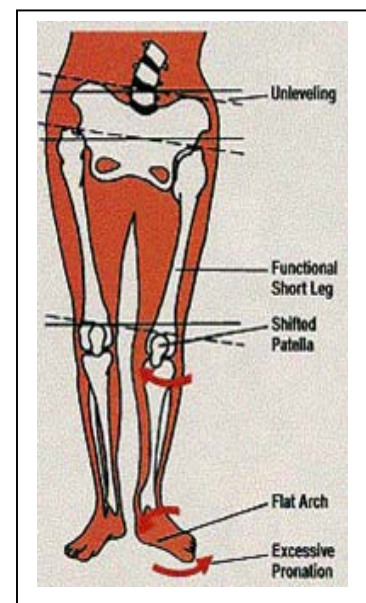
Muscles can be divided into various categories, such as *slow-twitch* versus *fast-twitch* muscles, *prime movers* versus *stabilizers*, *smooth* versus *striated*, etc. The categories that primarily interest us in this chronicle are the prime movers and stabilizers.

Prime movers are, as their name indicates, muscles designed to move segments of the body. A good example is the biceps muscle: when you flex your biceps, your elbow bends and your forearm comes towards your upper arm. These are the muscles that we old-schoolers are used to working on at the gym. The other group, the stabilizers, are less well known (you may also know them as *postural muscles*). They lie deeper, beneath the prime movers. They mainly act to hold steady positions, maintain your posture and work against gravity. A good example is the action of the Quadratus Lumborum (QL): when you are holding your balance on one leg, the other side of the pelvis stays level (it doesn't fall down), even though it is not supported by the leg anymore. That is what stabilizers do, they work to keep you aligned, not to move you.

Keeping in line

So why are they so important if they don't move you? What happens when those muscles are weak? Typically, you don't notice at first. Slowly your posture changes and you simply adapt. It can often be the beginning of nagging injuries that just won't go away, but it can also hold your skiing back. Gravity wants to pull us towards the ground. Since bones are rigid and don't sag downward (thank goodness), gravity affects our joints by trying to pull them closer to the ground by twisting the whole body. Final result? Poking chin, hunched back, pelvic tilt, internally rotated leg and collapsed arch of the foot (see figure 1). Not a pretty picture, but also not a very efficient posture.

Apart from restricting your breathing at the chest, such rotated posture means that you are not flat on your ski. It also means that the muscles are rotated, so they hold back and cannot give you all the strength they have, fearing something would break.



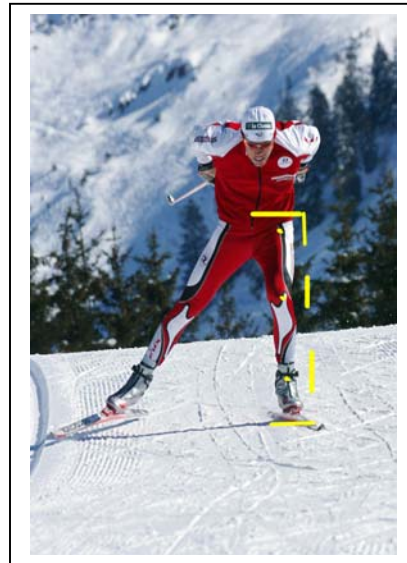
You can also imagine that constant rotational force on muscles can potentially cause injuries or delay healing of existing ones.

So... restricted breathing, weak muscles and skis constantly on edge... is that enough to convince you yet?

Holding a flat ski

I can hear smarty-pants saying “but don’t we want our skis to be able to edge?” Yes, you do want to be able to edge, but only at the right moment, not when you are trying to glide or push straight down. You want to spend most of your time on a flat ski (particularly true for the classic technique) so you can glide. Gliding is the art of moving fast without any effort, so a flat ski is very important. Also, skis are designed to be compressed by a force perfectly perpendicular to the camber (the arch of the ski), meaning that if your foot is not flat on the ski you cannot work it properly and your ski will feel too stiff for you and you won’t get a nice return of energy from it. Lastly, riding on your edge will wear out your wax a lot quicker on that side (both kick and glide wax), which is very debilitating in a long race. And let’s not forget that an edged ski wants to turn... bad news when you are trying to catch Johnny!

If you are not convinced yet, take a look at these 2 photos. Look at the angles (in yellow) and how much stronger the straight lines look. Who would you bet your money on?



What to do?

So okay, you are convinced your alignment needs some work. Where to start? First of all, you must make sure that all of your joints are flexible and mobile enough to allow for proper alignment; it is not rare to see joint restrictions from old injuries limit how straight joints can be. For a good body assessment, consult a sports physiotherapist (physical therapist in the USA). Once your joints are “clear”, then proceed to strength. What body parts seem to let you down? Hip? Knee? Ankle? All of them? To find out, stand barefoot on your right leg in front of a mirror (shorts will help). If your pelvis drops (as in Figure

1), then you want to focus on the hip and core (abdominal wall and low back) muscles. If your knee turns to the inside or shows an angle, then you want to work the hip (because it controls the femur) and the knee stabilizers (VMO mainly). If it is the ankle that drops to the inside and your arch collapses into the ground, then you want to focus on the lower leg and foot muscles. If everything collapses, you will probably need some help – see below. Repeat with your other leg – both legs may perform very differently.

I have my favourite pre-season (and all year round) exercises. Here are 2 that give the whole lower body a great workout.

1. **Half-squats with ball:** place a ball between your hip and a wall. Make sure you



can see yourself in a mirror. Push your hip against the ball and lift your foot off the ground. Stage 1: try to hold a perfect alignment of all the joints. Once you can hold it for 30 seconds without losing the alignment, try stage 2. Stage 2: maintain perfect alignment and bend your knee into a half-squat. Focus on keeping everything aligned. Hold for 5 seconds and come back up. Repeat until you can't hold proper alignment anymore. Stage 3: perform exercise as above, but remove the ball and the wall support. Repeat with other leg.

2. **Lunges:** position yourself in front of a mirror. Place one foot on a box of approximately 30cm in height. Move your body so that the front foot

is aligned with the knee. Bend down to a 90-degree angle at the knee, focusing on keeping hip, knee and ankle aligned perfectly. Hold for 5 seconds, come back up. Repeat until you cannot hold a good alignment. Repeat with other leg. A good progression is to trade the box for a body ball.

These exercises, along with regular strengthening, should be done 3 times a week in the pre-season and maintained 1-2 times a week during the ski season.



Need more help?

You have been working on these exercises religiously for quite a few weeks and you still can't get past Stage 1 of the Half-Squats? You may need a little extra help. Ask your physiotherapist or a personal trainer to assess the strength of each muscle group of the core and legs. Target any weak muscle group for 4-6 weeks and return to the exercises above.

Still not successful or just want more? Consult a certified pedorthist and assess the possibility of getting orthotics that will give you a better foundation.

Happy trails!