Pilates is a form of overall strength and conditioning used in the development of strong core muscles also focusing on breathing, balance, and range of motion. Pilates helps increase joint stability and strengthens deep core muscles as a result leading to injury prevention and improved athletic performance. Even the most basic Pilates exercises can be incorporated into a regular sports-conditioning or fitness regimen such as in a warm up or as a means of working on (neuromuscular) coordination.

Pilates focuses on deeper muscle groups or local stabilizers. These muscles are key when controlling joint movement and maintaining joint stability. Pilates starts training the joints at lower loads and then slowly progresses to strengthening eccentrically (when the muscle fibres lengthen) which will in turn help control the deceleration movements.

Most sports require both mental and physical skill. Pilates allows for the training of both, mental and physical, by requiring a certain level of mental awareness of what the body is doing. Training the mind to be aware of what the body is doing while physically training the body and its muscles will then translate into a mental awareness of the body’s movements during sports performance such as skating.

When skating a certain amount of lower body strength is required. Balance is also necessary so a certain amount of core strength is required. Upper body strength is not as crucial when skating unless skating is part of a sport, i.e. hockey, speed skating, figure skating, ringette etc.

Muscles used when skating are the muscles in the lower body, specifically the calves (gastrocnemius and soleus) and front of the shins (tibialis anterior) to move the ankle joint during the push-off and gliding phases of skating. Quadriceps and hamstrings to extend and flex the knee, respectively, during the push off and gliding movements when skating.
ALPINE SKIING

All muscles perform an action. All movements we perform throughout our day are made up of a combination of these individual actions performed by our muscles. As a result, more than one muscle is involved in any one movement. So it is reasonable to expect that training for a particular sport or activity involving many different and complex movements of the body would require training a group of muscles.

For Alpine skiing the main group of muscles that are used to perform the movement are in the lower body. In particular the groups of muscles are hip muscles, hamstrings, quadriceps, calves and muscles in the feet. These muscles groups can be further broken down to the gluteus medius, peroneus longus, adductor longus, gluteus maximus, rectus femoris, vastus intermedius, biceps femoris and semimembranosus. (refer to the links and pictures on the website for these muscles and actions.)

Let’s have a look at the actions of the body that these muscles can perform.

- **Gluteus Medius** – anterior fiber abduct (move away) and internally rotate the thigh. The posterior fibers externally rotate the thigh
- **Peroneus Longus** – dorsi and plantar flexes the foot (flexes and points the ankles, respectively)
- **Adductor Longus** – adducts, flexes and internally rotates the thigh
- **Gluteus maximus** – extends the hip, externally rotate the thigh, abducts the thigh and assists to stabilize the knee when fully extended
- **Rectus femoris** – extends knee; flexes the hip
- **Vastus intermedius** – extends the knee
- **Biceps femoris** – flexes (bends) the knee and extends (opens up) the hip
- **Semimembranosis** – extends the hip, flexes the knee and pulls the medial meniscus posteriorly during knee flexion (when knee is bent)

While the lower body is working to perform the movement what is the upper body doing? Without good balance, you’ll fall over while skiing downhill. As a result the ‘core’ muscles need to be strong to maintain stability while skiing. These include the abdominal muscles, muscles of the spine and lower back and pelvic floor muscles.

When muscles are performing actions they are contracting in some way. Either concentrically (shortening) or eccentrically (lengthening). When skiing the muscles contract eccentrically. So the muscle is lengthening when it contracts to perform the movement.

An example of this would be while you’re skiing you’re in a squatted position using your quadriceps in the same way you would when walking down stairs or in a lengthening or eccentric manner. The rate of the contraction of the muscle is slower compared to running and other activities. A reason for this is that the hip angle doesn’t change much while turning in skiing so the speed of the contraction is relatively slow.

Gluteus maximus to help extend the hip joint, abductors and gluteus medius to move the leg away from the body (abducting the leg) and external rotators muscles to help turn the leg and kneecap outwards. These are all movements that are commonly used when skating.

Abdominal muscles help keep the trunk of the body stable, helping maintain balance, while the lower part of the body is working.

All these muscle groups can be strengthened through a combination of Pilates exercises on the reformer and mat making skating more enjoyable.

Continued: SKATING AND PILATES

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Cross country skiing is not only a great way of enjoying the outdoors in the winter but also a nice full body workout. There are three main muscle groups used when cross country skiing, upper body, core and legs.

In the upper body the swinging action of the poles to push off the snow involves the triceps, back of the upper arm, biceps front of the upper arm and pectoralis major, chest muscles, are used. The triceps and biceps work together when using a diagonal cross country ski stride. When planting both poles in the snow to push off, mostly the biceps are used. When using the skate ski technique, the triceps are mostly used. The pectoralis major muscles are used when using the pole planting technique. The latissimus dorsi muscles are used, mostly in the double pole planting technique.

In the lower body, the gluteus maximus, largest muscles of the buttocks, are used quite a bit in cross country skiing especially in the skate skiing technique, to extend the hip and rotate the leg outwards. The constant pushing off with the legs to gain forward movement involves various muscles of the legs. For example when using the diagonal cross skiing technique the gastrocnemius muscle, calf muscle, is used to both plantar flex the ankle “point your toe” and to flex the knee. This muscle is used quite vigorously in diagonal cross-country skiing. The sartorius muscle, thin muscle running diagonally from the upper part of the outside of the thigh to the lower inside of the thigh is used in the diagonal and skate skiing techniques to help abduct the leg, i.e. move the leg away from the body. The rectus femoris, one of the four muscles making up the quadriceps, is also used to flex the hip and extend the knee.

The abdominal muscles, the rectus abdominus extending from the ribs to the pelvis, are used quite a bit in cross country skiing, especially in the double pole plant technique.

A combination of reformer and matwork will help target all the muscle groups used most when cross country skiing. Matwork targeting the abdominal and the reformer used to target the lower body, arms and chest.

From all this information we can gather that training for skiing should focus on the lower body, eccentrically and at a fairly slow rate of contraction. So slow, controlled movements concentrating on technique will better maximize the benefits of the exercise for the purposes of alpine skiing.

A combination of exercises on the mat and reformer can help get you improve your physical condition for skiing. The resistance provided on the reformer allows for a larger variety of exercises for the lower body. All area of the legs can be strengthened, lying down, sitting and standing. Balance can also be incorporated with these exercises giving the core muscles a chance to develop. All exercises in Pilates involve the ‘core’ muscles including the pelvic floor. Whether these muscles are used as stabilizers or as prime mover, the abdominals are always engaged in Pilates and while skiing.
SNOWBOARDING

Snowboarding is slowly growing since it was invented in 1965 reaching a peak in the 1990s. Consistently increasing in popularity since. Over half of the snowboarders are aged 7-17 and 25% are women. One out of every eight snowboarders is between the ages of 25-44. (18-30 years are the largest group) People are taking up this sport at every age.

So what are some of the physical benefits of snowboarding? It’s a physical activity so you’re getting out and about and moving, even if it’s just falling and getting back up again, which is great if your life is relatively sedentary or spent indoors. Recreational snowboarding can burn up to 630 calories/hour and competitive snowboarding, double that!

What is required physically of a snowboarder? A high degree of strength and balance to transition from edge to edge while maintaining balance despite the changes in terrain, speed and weather conditions are necessary.

With the different types of snowboarding there are a different set of challenges.

DIFFERENT TYPES OF SNOWBOARDING:
Giant slalom and slalom events are ‘carving’ or ‘downhill’ racing events. i.e. the snowboarder runs gates on a dual course like skiing. Longer boards and harder boots are needed for this. When carving at high speeds the boarder’s body faces down the hill most of the time. A high degree of concentric, eccentric and isometric strength is needed to perform well.

Halfpipe, slopestyle and Boardercross events are “free riding” or “all mountain” boarding with spinning, flipping, jumping and landing.

MUSCLES USED IN SNOWBOARDING

Some of the primary muscles used when snowboarding are core muscles (abdominals, back, pelvic floor), foot/ankle muscles, upper leg muscles, hip and glute muscles.

Core Muscles
A great deal of balance is required when snowboarding so your core muscles (abdominals, back and pelvic floor muscles) will be working and need to be strong. All the exercise in Pilates use these muscles in some form whether as the prime mover or as a stabilizer. Either way they are being strengthened and toned all of which increase your stability and balance while snowboarding.

Feet and Ankles
Your feet are connected to the snowboard, your feet and ankles muscles are working to help you make cuts and turns so injuries to the ankles are quite common while snowboarding. Wrist fractures and sprains, shoulder injuries due to impact from falls and neck whiplash are also common when snowboarding. Increasing the strength in the tendons and ligaments of the ankles, wrists, shoulder and neck can help to minimize injury. Pilates can help with strengthening and toning these areas. Learning to stabilize the shoulder girdle through Pilates exercises will help strengthen muscles, tendons and ligaments in these areas. Specific exercises for these areas are also available on the mat and reformer. There is plenty of reformer work for the feet, calves

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and ankles. Pilates is done without shoes so the muscles in the feet and ankles must work.

**Thighs**

Quadriceps and hamstrings play large part in snowboarding. While they do not control your movement and direction as much as the feet and ankles the lower you are the better you balance will be. Maintaining that squatting position requires strength and muscular endurance in the quadriceps and hamstrings.

**Hip and glute muscles**

These muscles are used to help you steer and carve. It is very common for people who sit all day for work or school to have tight hip flexors. Stretching out the hip flexors is very important. Over all flexibility is also important for snowboarding and injury prevention. There are a number of exercises on the reformer in Pilates that will help strengthen, increase muscular endurance in the quadriceps and hamstrings. Strengthening the glutes and hip flexors as well and stretching out the legs in all planes can be done quite well on the reformer.

Snowboarding is an asymmetrical sport. You’re mounted on the board one leg in front of the other. This means you must be strong in this position but as a result muscle imbalance in the body is likely and the repetitive stress to the muscles of snowboarding can result in postural imbalances leading to injuries. Strengthening both sides of the body equally is important, not just for snowboarding but for all asymmetrical sports.

The lower body does a lot of the work in snowboarding. This doesn’t mean the upper body can be neglected. Falling is inevitable. Having the strength to lift and push yourself up off the snow requires some basic upper body strength. When you aren’t picking yourself up off the snow the upper body must be stable. Core strengthening and conditioning is required for this as well as learning how to stabilize the upper body will help.

Breathing doesn’t sound so hard. But efficient and controlled breathing while snowboarding may be tougher. One of the main components of Pilates is breathing, effective, efficient and controlled breathing. Through Pilates training you will learn how to breathe efficiently and controlled while being active maximizing your lung capacity and oxygenating your blood throughout your snowboarding.

While snowboarding you’ll need to be able to feel the snow and terrain beneath you. Some kind of proprioceptive training will help with this. This is being able to sense the position, location, orientation and movement of the body and it’s parts. Pilates can offer this in particular on the reformer which allows for more dynamic training.

Pilates can address muscular endurance for various muscles groups including the ones used for snowboarding. Unless you’re a seasoned practitioner of Pilates, you probably will not be able to go through the exercises quickly enough to get your heart rate up enough to benefit cardiovascularly. Some additional cardiovascular exercise is advised.
SNOWSHOEING

For those that hate the winter and feel like it drags on and on, getting out and enjoying the season is the best way to make it go by quicker. If you’ve never tried any winter sports or activities, snowshoeing is great winter activity to start off with. It’s as easy as walking.

A bit about snowshoeing. Snowshoes have been around for 6000 years and were one of the earliest forms of transportation. They are as easy to put on as shoes. They are highly maneuverable so you can go where cross country skiers and snowmobiles cannot. Anyone can snowshoe. The learning curve is small with no fancy techniques or theories to learn. Snowshoeing requires a modest level of physical effort and a desire to get out and enjoy the winter weather. Snowshoeing is great for a hike in the woods or for an overnight backpacking trip or alpine climb. It is a very inexpensive activity and great for all ages. So very suitable for the entire family. Simplicity is the one of the biggest assets of this sport. They can be used in all types of snow conditions.

Some things you may not have known about snowshoeing:
- 46% of snowshoers are women
- 12% of snowshoers and children, 7-17 years old
- 55% of snowshoers are under the age of 45
- 1.4 million people identify themselves as snowshoers
- You burn 45% more calories snowshoeing than walking or running at the same speed.

The physical benefits of snowshoeing:
- Good sport for cross training.
- Low impact and safe
- Provides and aerobics workout combines with strength training and muscle endurance.
- Uses every major muscle group at a relatively high intensity for extended period of time
- Individuals that have substitutes snowshoeing for running during the winter actually improve their running fitness over those who chose to run as their primary source of winter training.
- The demands of snowshoeing can build endurance levels and strengthen quadriceps for runners.
- Muscles used for snowshoeing are similar to those used for walking and hiking hilly terrain. Hip flexors and quadriceps may get more exercise than usual walking due to the lifting motion of each step in snowshoeing.

Climbing in snowshoes works the hip flexors and extensors, important muscles for cyclists.
- Using poles while snowshoeing gets the upper body moving, conditioning arms, shoulders and back muscles.
CURLING

The sport of curling originated in Scotland in the sixteenth century. It is common way for Canadians to take advantage and enjoy the winter months. Of the 1.5 million curlers worldwide, 80% are Canadian. Curling is a sport that is adaptable to most ages and physical abilities and not only is a great way to keep fit during the winter but also a great way to socialize.

Curling is a very safe sport. The overall injury rate is only 3.5%. Curlers are seldom injured seriously to the extent that their injuries have stopped them from curling. The curling injuries that do occur are musculoskeletal in nature. The areas that are commonly affected are the knees, shoulders and back. Complaints about knees are most common among experienced curlers due to the deep knee bend and weight placed upon the leading or sliding knee. Adaptations are available to help throw rocks from a higher position but curling technique comes into play to minimize injuries. It’s common for curlers to rotate their sliding, forward foot outward to create a larger base of support. But you don’t want to rotate your leg out too much otherwise the stress on the knee joint will be too great. So it’s recommended to keep the rotation to 15 degrees. Also you don’t want to bend that front knee too much either or remain in that position longer than necessary.

As with any physical activity, the joints are only as strong as the muscles supporting them. Regular exercise geared towards strengthening and lengthening all of the leg muscles will help prevent knee injuries. Stretching the back, arms, shoulders, legs and groin area before and after each game is also a good habit to get into to help prevent injury. Lower back and shoulder problems usually result from improper sweeping technique, poor technique moving and sliding rocks. The curling stones are made from granite and can be quite heavy weighing up to 20 kg. So slide, don’t lift, the rock and bend at the knees while keeping your back straight.

When sweeping a vigorous bout of sweeping can raise the heart rate up to 170-200 beats per minute and over the course of a long tournament fatigue can accumulate. One good reason for physical conditioning is to avoid fatigue. Curling is similar to Pilates in that it requires both concentration and physical output. The exercises of Pilates provide a good form of conditioning for curlers. Pilates work on the reformer provides a number of good exercises to help strengthen and stretch the muscles in the legs and upper body to help with conditioning for curling and prevention of injuries.
There are many ways to make the most of the winter months and enjoy the season. We looked a few sports and activities but there are many more. You can find an extensive list of winter sports below.


Winter activities in the Ottawa Valley

http://www.ottawavalley.travel/Things_to_Do/Winter_Activities.html

Winter sports in the Toronto Region

http://www.out-there.com/ton01wnt.htm

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