



# Building the Perfect Machine

■ Marie-Catherine Bruno, *BsCPT, Cped(C)*

*When you want to win, there is only one way to do it: train a little, but train smart.*



Many feel that the weekly jog around the park makes them fit enough to win their orienteering class. Good for you if it is the case, but it should not be that easy. If you truly want to become a lean and mean machine and not only beat your competitors, but destroy them, you may want to start training not only a little more, but better.

I have reviewed many different athletic qualities/abilities one can train. Some of them are fairly insignificant for orienteering purposes, like Maximal Strength (unless you have to move 2-meter boulders out of the way), but some others rank very high on the list of important qualities and abilities to train. Here are the ones I think are important for our sport, with a little explanation of the quality/ability and a few examples of how to develop it and train it. For the purpose of building the perfect Machine, I will only focus on Physical abilities for the moment. Later, in a future chronicle, I will also look at Motor and Mental abilities, which are also extremely important to develop. These include Coordination, Balance, Tactics, Goal setting, Concentration and Emotional control.

*Please note that the terms used in this article to describe each quality/ability are taken from the Canadian National Coaching Certification Program and may differ slightly from the ones used by the Americans.*

## Aerobic stamina

It is your body's ability to use oxygen as fuel for your muscles and your heart (your heart is actually a muscle) during a dynamic effort that may last several minutes to hours. It includes your *base training* (meaning your typical long, slow distance training) but also requires work at a much higher intensity so you can be ready for racing pace. Good aerobic stamina helps you carry your speed throughout the entire race, helps you recover at the top of a hill, and allows you to keep your breathing under control.

It is important that you train that quality at varying speeds. The low intensity training allows you to build more capillaries (small blood vessels that irrigate muscles) and build more breathing cells (mitochondria) to use oxygen and improve your system's capacity to transport oxygen to muscles. Pushing it to a harder level also adds the capacity to push your lactate threshold (the point at which you start accumulating more lactic acid than you can

remove from the blood – lactic acid is a by-product of burning sugars) further.

You can train this quality by doing your regular easy jog, but you can also train at higher intensities, which will rapidly turn you into a beast! Try one of these little training sessions, after a proper warm-up:

- Repeated high-intensity effort of 3-8 minutes with a recovery of equal duration or less (e.g. 4 minutes hard/3 minutes recovery, 5 times)
- High-intensity, steady-state effort for 10 minutes, repeat once after a 5-minute recovery.
- Moderate-intensity steady-state effort for 30 minutes (called a Tempo)

Then, of course, cool down.

This may be a shorter training session than usual, but will be very effective. Start incorporating one of them into your regular training schedule, once a week. Also note that those training sessions do not necessarily have to be done running. You can develop your aerobic capacity by also riding a bike, swimming, cross-country skiing... whatever you enjoy that gets your heart going for a while!

## Speed-strength

Formerly called *power*, this quality allows you to develop quick bursts of energy. You need it mainly to jump over logs and fences, leaping from rock to rock, and for short bursts like a 2-contour hill. In other words, quite often in an orienteering event! The best way to train for speed-strength is to use a training method called *Plyometrics*. Plyometrics are explosive exercises that involve jumping. No need to say that you have to be well warmed-up and stretched before doing such exercises.

At the origin, plyometric exercises involved jumping down from a box and rebounding. Now that it has been developed further, it includes a plethora of exercises that may be done by jumping OVER obstacles, jumping UP ONTO an obstacle or the original jumping OFF an obstacle. The obstacle does not have to be very high when you start: a curb will do the trick. Make sure you warm up for at least 15 minutes and stretch.

So, jog over to a park where you can find logs, benches, curbs, hopscotch game... all sorts of obstacles to play with. Make sure you include all three ways of jumping, and also different directions (side to side, forward, backward). Skipping rope can also be considered plyometrics, but unless you are very agile with the rope, it is tricky to include all aspects of

plyometrics. My favorite is to develop a circuit (routine) that takes about 2-3 minutes

to execute (you can give yourself one or two breaks when you start!). Move quickly from one obstacle to the other, repeat the same movement 10 times, varying sides. Just play and don't stop jumping! At first, the 2-3 minute circuit might be enough. As you get stronger, give yourself a 2-minute break and repeat the circuit once or twice. You can also make it harder by increasing the height of your obstacles. When you are done, cool down for at least 15 minutes and stretch again. This is a hard workout, and although it is fairly short, it is quite intense. So warming up, cooling down, and stretching are very important.

It will not take very long until you feel stronger, especially on hills.

If jumping around does not excite you too much, you can also train speed-strength (power) by running up short hills. Pick a fairly steep hill and run up for 10-30 seconds. Walk back down and recover. Repeat 10 times or until your legs are not responding anymore!

## Strength-endurance

It is the ability to perform repeated muscle contractions. Think of going up a hill as a long set of single-leg squats. Because that is pretty much what it is! Then coming down would be the same, where you have to control your speed on the descent. So it is a very important quality for orienteers. A great way to train/develop that quality is to do a good warm-up, stretch, and then do sets of walking lunges (e.g. 4 sets of 30 lunges). Squats are also really good for orienteers and trail runners. To develop the endurance part of it, make sure you hold your squats for at least 15 seconds and that you execute them at a very slow speed. Single-leg squats are even more appropriate as they mimic our uphill/downhill actions better. It is easy to incorporate at least walking-lunges in your regular jog (for those of you who fear the gym), twice to three times a week. (See related article on page 21).

## Flexibility

I can already hear you: latest research has shown that stretching does not help to pre-





vent injuries. Well, I will not go into that myself, as I think a lot of research out there is done under very limited conditions and therefore does not always reflect reality. But, what I will do, is convince you that if you don't stretch to prevent injuries, at least stretch because it can improve your performance! Think about it: if your hamstrings are more flexible, they have more length. And more length gives you a longer stride. So for the same amount of energy, each step takes you further. Isn't that convincing?!!! And how about every time you have to go over a log. If you were flexible enough, you could simply stretch the leg and jump over the log instead of climbing onto it and then descending. Because let's face it, once you start training on this regime, you will have all the power necessary to jump over logs... but you will still need the range of motion! So listen to Baz Luhrmann's advice and stretch!

For muscles that are already fairly flexible, 20-30 seconds will do the trick. For muscles that are stubborn, hold each stretch for at least 2 minutes, up to a maximum of 4 minutes. This targets the *white* part of the muscle (tendon and fascia). Very often the muscle belly (the red part) is in good shape but it is the white tissue that limits the improvement. To find out how to stretch and which muscles or groups of muscles to stretch, refer to *ONA's Injury Chronicles* of May and July 2002.

#### Speed-endurance

This is another good one to train, especially for events that are held in those parts of the world where the forest is nice and open!. Also with the new discipline of Sprints, that one becomes even more important. It is the ability to sustain efforts

at near maximum speed for as long as possible. Contrary to the aerobic stamina, it is highly recommended that you train sport-specific for that quality. In other words, riding your bike fast will not make you run a lot faster. Ideally, you even want to take those sessions into the woods. But not everybody is so lucky...

Once again, begin with a nice warm-up and a stretching session. Your efforts will have to be close to your maximum speed, and recovery time will be 4-8 times longer. The total time of effort for such a training session is quite short: 3-10 minutes. But trust me, that will be enough! After you are warm and ready, run hard (almost as fast as you can) for 20-60 seconds. It is important that you respect the recovery time. Don't start another one until you feel your breathing is back to normal. If there is no forest available to you, go to a park where cars will not be a threat - it is quite amazing how much these sessions can tax your brain! You can also do that training on hills, but make sure you also do sessions on flatter terrain as the speed of leg turnover is important.

Here is an example of what such a session could be, after a proper warm-up: 30 second sprint, 3 minutes recovery; repeat 8 times. That gives you a recovery of 6 times the effort, and a total effort of 4 minutes. You can play with how many you do, how long you recover, and how long the sprint is. But always respect the recovery time - at least 4 times longer than the sprint. Then cool down and stretch. Hate me later!

It is amazing how quickly you will see results. Especially if none of the above was part of your training regime. These sessions do not replace your nice long Sunday jog, but they sure compliment it very well! Say goodbye to your competition!

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adult will be (with the group, on a different course, or waiting at the finish) along with the adult's cell phone number. It's prudent for adults-in-charge to obtain the cell phone number of the event coordinator as well.

Once on the course, a group always, always stays together. Even if the children are leading, the adult should keep track of where the group is on the map at all times, and MUST know how to use a safety bearing should the group become lost. Find out what time the courses close, and be back on time, no matter what. And always, always, always hand in the control card at the finish table, even if the group doesn't complete the course! Back at the car, each participant should have a complete change of clothes as well as more food and drink. Taking all of these precautions will go a long way to ensure a safe and enjoyable orienteering experience with children time after time.

Afterwards, once everyone is warm and comfortable, make time to relax together. Recount the stories and celebrate the accomplishments of the day, especially those of the children. Be generous - it's not too early to start building heroic lore: "Remember that patch of Greenbriar, and how you were able to dodge through it to reach the control? You were awesome!" (Then note how quickly that child signs up to go orienteering next time). Finally, don't forget to raise the age-old orienteering question: "What - could - we - do - better - next - time?" Good luck!

*Trina Waters is a parent, former NOLS instructor, WFR certified, Scout trip leader, with a whole lot yet to learn about orienteering.*

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