Warm Up & Cool Down

Preparation and recovery from sessions are probably the most important parts of your week. It can be argued that every run you do is either a session or recovery from a session, so performing well in those workouts is imperative for improvement. A proper warm up will prime you to perform well in a session, while a good cool down will enhance your recovery and help prepare you for training the next day.

Most people have been told to 'warm up' every time they do sport since childhood, but in my experience very few know how to do so properly. A good warm up should consist of several parts:

- *Jogging:* This gently warms up your muscles and joints, increasing your range of motion in preparation for the next stage of the warm up. A lot of runners find that they only start feeling good halfway through a session - this implies that the jogging stage of their warm up was not long enough! As an example, I will generally try and run at least 20 minutes before a hard workout or race.
- *Stretches:* Dynamic stretching such as leg swings will now allow you to reach your full range of motion without the risks of muscle strains or tears that are present if this was done first. Work your way into these as you go through the motions. It is important to avoid any static stretching at this point as this can overstretch your muscles, leading to a decrease in power and an elevated injury risk.
- Drills: These will help to improve your form and power before the session. There are many different possibilities to explore, but common examples could be hurdle drills, A/B/C skips, carioca, or dribble bleeds (Duncan's favourite!).
- Strides: Finishing your warm up with strides allows your body to get used to running at high speed, making your workout feel like you are at a more comfortable pace that it would otherwise. They also help improve your form for relatively little energy expenditure.

On the other hand, the cool down allows you to help flush lactic from your system after a hard workout or race, and to gradually allow your muscles to relax without stiffening and tightening like they would otherwise. This allows you to recover better for the next day's training and the next session. Cool downs are much simpler than warm ups, and generally just involve slow jogging which decreases in intensity until you reach a natural stop. This run will generally last for a similar duration to the warm-up jog. After this you should go into your usual post-run recovery routine (stretching, massage etc.).

Training Intensity

Probably the most common mistake I see in training (other than increasing volume too fast) is a runner training at the wrong intensity. More often than not this manifests as the runner going much too fast, often as hard as they can every time they train, leaving them tired and unable to perform at their peak come intense interval sessions. This is called the 'grey zone', where a runner is training too hard day-to-day to see good aerobic gains or recovery properly overnight, but not hard enough to see an increase to their threshold limit or VO2 max.

So how fast should you be running on an easy run? A good guideline is to find the fastest pace you could run a 5k at - your training pace should then be at least 1min per km slower than this, ideally 1:30 below that pace. For example, if you can run a 5k in 25 mins (5:00/km), this would equate to an easy pace of around 6-6:30/km. Of course this is only a rough estimate, and is affected heavily by a multitude of factors such as gradient, terrain and temperature. If you are able to, I have personally found heart rate (HR) to be a far superior metric to work with. With correctly calculated heart rate zones, most runs should be in zone 1 or lower zone 2 - anyone with a compatible Garmin watch will have estimates of these already given, however they can take some tweaking to be correct if you don't fit the given model. If you don't like to look at pace or other metrics, focus on maintaining an intensity that would allow you to carry a conversation partner (or better yet, bring a partner along to have a conversation with!).

Most of your weekly volume should be at this intensity; a commonly quoted rule is the '80/20 rule', wherein the runner spends 80% of their time at this low intensity state. Running at this easy pace does an excellent job of building your aerobic fitness, allowing the runner to be fresh for the days when they need to run hard and fast. Remember, ego has no place in training - no-one will remember the day you ran 20s per km faster than them round a recovery jog if you can't back it up when it matters in a race.

Form & Cadence

Having a great running form is the keystone of every successful runner. A good form will make you more efficient and help prevent injury, while a bad form will stunt your performance as you waste energy overcoming preventable technical issues. The keys to a great running form are:

- **High cadence:** 170-180 steps per minute depending on physiological factors.
- **Slight forwards lean:** Chest pulled up and forwards, not bent over from the hips.
- **Pelvic tilt:** Keep glutes engaged and avoid anterior pelvic tilt ('sitting down' in your stride). The glutes are your strongest muscles - use them!
- **Arm swing:** Avoid crossing the body's center line with your arms - this results in excess rotation through your trunk which wastes energy.
- **Foot impact:** Foot strike should ideally be directly below your center of gravity to avoid a braking effect. This will naturally make you contact the ground in the most efficient way.
- **Stride length:** Chop your stride short at the front and extend your leg through the rear of the stride. This automatically helps with all of the above.
- **Upper body posture:** Shoulders level and relaxed while keeping head straight and looking directly ahead.

Doing all of the above will not only make you a more efficient and faster runner, but also ensure you are upright and well balanced. This is especially important while orienteering to help prevent falls and also assist spotting well hidden controls!

When trying to improve your form, focus on your biggest weakness first as it can be overwhelming to initially make all these adjustments at once. If you have no idea where to start, I would suggest improving cadence to 170-180 steps per minute. A recent study has suggested that injury risk can decrease by up to 5% for each step rate increase per minute (Kliethermes et al, British Journal of Sports Medicine 2021)! It should be noted that taller runners will almost always have a lower cadence than shorter runners, with a longer stride length due to the necessities imposed on them by their own biomechanics. Each individual is different, but this rule is a good place to start.

Strides

Strides should be a staple of every runner's training no matter the distance, from sprinters all the way up to marathon runners. They are a fundamental exercise for building both speed and coordination at all levels. Strides will help you to increase cadence, improve running economy and prepare you for faster running.

Strides are short, 10-20 sec accelerations where you start at an easy jog and build up to about 95% of your maximum speed, before gradually slowing down to a stop. You should aim to be running at top speed for around 10 seconds; generally this will mean you end up running ~100m total. Start out by running 4 strides if you've never done them before, taking 60-90 sec between reps to fully catch your breath, then build up to 8 or 10 over a few weeks.

Running strides is not an aerobic workout - there is no benefit whatsoever in shortening the recovery between strides - and they should be short enough as to not provide any extra stress on your body. Because of this, strides can be incorporated into most runs - they should be run before any speed workouts or races to prepare your body for running at fast speeds, and also once or twice a week after an easy or long run to help prevent your legs becoming sluggish and fatigued.

As for terrain, strides should be run on flat, solid ground where you can properly put power through the floor and not be at risk of acute ankle injury. You can also use this to help transition into wearing more aggressive race shoes such as flats or spikes, running most of a workout in your normal shoes and switching to the more aggressive shoe for strides in order to avoid extra lower leg stress.

The Long Run

The long run (often abbreviated as 'LSR') is the most important run of the week, and this goes double for orienteers. The majority of orienteering races are not a flat out test of speed, but one of endurance over a long period of both distance and time. At the open-elite level (M/W21E) expected winning times for classic and long races are often in the ballpark of 80-90+ minutes, covering upwards of 16km straight-line distance for the men and 12km for the women. Factoring in route choice and running speed, this means an orienteer could easily end up running upwards of a half marathon and for over 150 minutes during some races! Without proper training just getting round this distance can be very hard, not even considering the effect this has on the ability to navigate.

Long runs provide benefits to running economy at all paces, significantly improving the efficiency of your stride by strengthening connective tissue and improving nervous system recruitment patterns. They also help to build capillaries around slow-twitch muscle fibres, allowing for better recovery and lactate transport when running at higher intensities.

In my opinion, the length of your long run should be based on time, not distance covered. It should normally account for around 25-30% of your total weekly volume, however this is only a guideline, and it can vary from as much as 60% for a runner only doing two runs per week, down to as little as 20% for those training at very large volumes. A long run is also generally the slowest run of the week in order to compensate for this, although adding in steady efforts near the end of a long run can help to adapt the body to working at a higher intensity near the end of a race.

As always, all runners should ultimately let their body's feedback determine the duration and intensity they work at. A long run should remain aerobically comfortable throughout - working too hard in a long run will ultimately only hinder you in the next week as your body struggles to recover for upcoming sessions and other workouts.