

## **Key Session Series**

In this series we will look closely at 5 sessions which traditionally form a key part of a runner's programme.

1. *Interval Training*
2. *The Long Run*
3. *Fartlek Running*
4. *Tempo Running*
5. *Hill Training*

### **1. Interval Training**

#### **Why do interval training?**

Interval training is the practice of running repetitions of high-intensity work with rest periods between repetitions.

The advent of scientifically-founded interval training is generally attributed to the great Scandinavian distance runners of the years between the first and second world wars.

Nowadays interval training is an accepted key component of most runners' training programmes. The reason for this becomes clear when we list some of the acknowledged benefits:

- Allows you to operate at race pace or faster and gain the training benefit of running at that intensity without completing a race
- Allows you to get used to running at race speed or intensity
- Pushes you into higher heart rate zones during your training session
- Assists in building and tracking progression in your training schedule
- Provides a flexible and effective session which can be adapted for any objective
- Brings variety, interest and motivation to a training programme
- Studies have supposedly shown that, compared with steady running, interval training speeds up fat burning in the muscles

When Roger Bannister broke the 4 minute mile in 1954 his core session was 10x400m with 2mins recovery, which he would run at 60secs/lap, which is of course precisely 4min/mile pace. In doing this regularly, he was effectively running two and a half 4 min/miles at least once or twice a week.

Naturally, over time, his body would become more efficient at that pace; enabling him ultimately to string 4 of these 400m reps together at 60s each with no recovery and so break the famous barrier.

#### **Devising Interval Sessions**

The challenge with devising interval sessions is to ensure they are relevant to your training objective. If we consider that there are four variables in play with an interval session:

- Length of repetitions (distance or time)
- Number of repetitions
- Pace of repetitions
- Rest time/distance between repetitions

Then it becomes clear why juggling these variables to reach an effective session is often viewed as something of a science.

Coaches who set interval sessions tend to vary in their approach. Many stick to several well-used and traditionally acknowledged sessions which can be found in coaching manuals or passed on through experience.

For the running masses, such sessions should be sufficient to bring about significant improvement.

*Examples of these sessions are listed at the end of this article.*

Some coaches, particularly of elite athletes with the benefits of laboratory testing and accurate fitness indicators, are able to devise interval sessions which are very precise in all 4 variables. Success margins are very tight at this level, so coaches will micro-manage each element of their athletes' training to squeeze out every last drop of performance.

Obviously this is not necessarily applicable to the majority of us runners who have much room for improvement within the boundaries of our current schedules and fitness levels.

*However, even without the benefit of the scientific expertise and facilities available to the elite tier, it is also possible to personalise your interval training and get more return for your effort with a simple technique.*

## **Personalising your session**

Firstly you need to return to your goal (see the previous article: "Follow the Greatest").

As an example, let's assume this goal is a 40 minute 10k race.

Stated in terms of an interval session, that's 10x1km in 4mins per km with no recovery between the "repetitions."

Put like this it sounds daft, but if you did this, you would have your 40min 10k. So how can we use interval training to achieve this?

To begin devising your session follow some simple principle steps:

- 1) Break your target into manageable chunks of distance at the target pace
- 2) Over time, gradually increase the total distance covered in the session, maintaining the target pace
- 3) Over time, gradually reduce the total amount of recovery in your session down to as close to zero as possible

So, taking our goal:

- 1) Let's say you can currently run about 1km at this target pace before tiring. And let's say you could repeat this 3 times with a gap of 4mins between each repetition.

You already have an interval session: 3x1km with 4mins recovery at 4mins/km

- 2) Once you are comfortable doing this session, add more total session distance, either by increasing the rep distances, or easier, by adding another rep. If you can't manage an extra 1km at the target pace, add a shorter rep, say 500m. Then in time build this 4<sup>th</sup> rep up to 1km. You could then add a 5<sup>th</sup> rep, etc...

When you reach 10 reps, you have reached your target distance.

- 3) Start to reduce your overall recovery!!! This is the **most important** and most often neglected **progression step**....

So let's say over several months you have built up to running 10x1km at 4mins/km with 4mins recovery. Now, try shaving 10secs off the 4min rest periods. So your new session is 10x1km at 4mins/km with 3mins 50 recovery. Keep shaving recoveries each time you complete the session. Continue to do this at a manageable rate. If you start to slip from your target pace, go back to longer recoveries until you are ready to move on.

An alternative method for step 3) would be to increase repetition distances whilst reducing number of reps to keep overall distance the same. For example, progress from 10x1km with 4mins recovery to 9x1.1km with 4mins recovery. You can see that this has the same effect of reducing overall recovery from 36mins to 32mins.

If you adhere to the principles above you can vary how you compile the session.

Traditional interval sessions often involve a fixed number of repetitions at fixed distances and progression is achieved by become faster and faster at the reps.

This is fine and no doubt builds progression, but both logically and physiologically, **reducing recoveries** is a much more effective way of achieving the goal of the session:

- Logically speaking, your target is to run continuously at a set pace, so reducing the recovery between repetitions in order to "join all the repetitions together" with no break is a more obvious

approach than becoming faster for shorter distances and assuming this will add up to a continuous pace over a longer distance.

- Physiologically speaking, you are getting fitter as you progress, which is reflected in you being able to operate at the same intensity, but with a reduced heart rate (HR). Elite athletes use HR as a recovery indicator during interval sessions, ie: when their HR has dropped below a certain threshold after a rep, it is time to set off on the next rep.

If HR reduces as we get fitter, then it follows that what elite athletes are actually doing when they use the HR method **is reducing their recovery time** between repetitions.

## Example Interval Sessions

Here are some suggested interval sessions designed to meet specific target race distances.

**Don't forget to thoroughly warm up and down (including stretching) before and after each session. If you are running fast, you need to find a suitably safe place to perform these as well. Once you are "in the zone" on a rep it is easy to neglect your own safety!! Off-road on firm grass during the day is the best environment.**

If you are not used to intervals, take it steady and don't get carried away. Start with one session a week or fortnight.

Session	Target	Sample Variations	Comments
<b>1-2min or 300-500m reps</b>	Core session for races up to 5k Speed work for longer races. Develops lactate tolerance: helps with sprint finishes or varying pace within a race.	<b>For 1500/Mile speed:</b> <i>6x300m, 45secs recovery – Seb Coe's baseline session.</i> <b>For 5k racing:</b> <i>6-10x400m, 2mins recovery (run at 1Mile race pace).</i> <i>16x400m, 1min recovery (run at 5-10k pace).</i>	To increase work-rate, increase resistance by running the session on an incline and reducing pace where necessary. Try to run shorter rep sessions off-road as it reduces the impact on your body. Ensure you warm up thoroughly prior to attempting any speed work, particularly the shorter, faster reps.
<b>3min or ½ Mile reps</b>	Core session for races 5k- 10Miles. Good faster session for HM and Marathon	<b>For distances 5k-Marathon:</b> <i>8x3mins or 8x1/2M, 2-3mins recovery (run at 10k pace).</i> <i>Try 3 sets of 3x3mins, with 3mins recovery between reps within a set and 6 mins jogging between sets. You get 9 reps with a total recovery of 30mins. This is great if you (a) want to run the reps a bit faster or (b) can't cope with reeling 9 off in a row with only 3mins between.</i>	Great balance of speed and endurance. If you could only ever do one interval session, it should be this. 3min reps are often held to be the most effective rep distance by exercise physiologists. Try running the 1/2M reps with 5min "turnaround" – so you start the second rep 5mins after the start of the first rep, and so on... Then your recovery varies according to how fast you run the rep – run faster, get more recovery and vice versa.
<b>4-6min or ½-1Mile reps</b>	Endurance-oriented session for all distances. Most effective for 10k-HM. Still fast enough to be speed work for HM and Marathon.	<i>5x1Mile, with 2 mins recovery (run at 10k-HM pace – this is a tough session. Build up to it by starting with the session below).</i> <i>5x5mins with 3-4mins recovery (slightly longer recovery and slightly shorter rep times mean you should push towards your target 10k pace with this one).</i>	With the tougher sessions, build up to them by using the "speed work" sessions in combination with tempo runs. The tempo runs give you the endurance aspect, and the shorter interval sessions (such as 5- <i>10x1min</i> ) give you the ability to carry the pace. Then it's a case of carrying it for longer.
<b>6-15min or 1-2Mile</b>	Ideal for inexperienced runners	<i>3-5x6mins, with 3-5mins recovery. Keep</i>	Longer reps such as this appeal to a range

<b>reps</b>	looking to carry a pace for longer. Endurance-based session for 10k+	moving on the recoveries. This becomes almost a structured fartlek session. <i>2x2Miles, with 10mins recovery.</i> Try to run at 10k-HM pace. Keep the pace consistent and even.	of abilities: for new runners it is a way of breaking down a tougher longer run into digestible chunks.
<b>15min+ or 2Mile+ reps</b>	More a split tempo session. You would usually only look to do 2-4 reps total Builds speed endurance for longer races of 10M+.	<i>2x15mins or 2x2M recover by jogging for 5-10mins between.</i>	Enables you to cover your usual steady run distance in a faster overall running time, without the harshness of a tempo run.
<b>Pyramid Session</b>	A combination of reps of varying distance/time/recoveries. Can be used adapted to cover any of the objectives above. The key to getting the most from pyramids is clever use of recoveries between reps. Keep them short enough for the next rep to be challenging but not impossible.	<b>For up to 5k:</b> <i>200m, 400, 600, 800, 1km, 800, 600, 400, 200.</i> <i>Try 1-2mins recovery after the short reps and 3-4 mins after the longer reps.</i> <b>For 10k:</b> <i>2mins, 3, 4, 5, 4,3,2</i> <b>For 10k-Marathon:</b> <i>2mins, 5, 10, 5,2 - recover by jogging for the equivalent of the previous rep</i> <i>½ mile 1 m, 1½ m, 1m, ½ m (jog for 3-5mins between)</i>	For recoveries, try matching or halving the time/distance of the preceding rep (eg: try <i>1min rep, 1min rec, 2min rep, 2 min rec 3min rep, 3min rec, 2min rep ,2min rec, 1min rep</i> ). This gives you extra recovery in the 2 <sup>nd</sup> half, enabling you to increase or maintain the quality of the reps. Invert the pyramid to develop pace change and strength endurance for that key period in the middle of a race. For example try: <i>4mins, 3, 2, 1, 2, 3, 4.</i> – again match the previous rep time for recovery. This makes later reps more challenging as you get less recovery in the 2 <sup>nd</sup> half
<b>Combination intervals</b>	Devise your own combination sessions to suit your specific needs. Use the information above plus your experience of how the intervals help you in order to create personal sessions. Follow a long rep immediately with a short rep to develop finishing speed for example.	<b>For 10k:</b> <i>Run 1km at 10k pace, rest for 1min and run 400m fast. Recover for 5mins and run the set again. Try 3 sets.</i> <b>For 10k-Marathon:</b> <i>5mins rep, then rest for 2mins, then 1min rep</i> <i>Do 2-4 sets.</i>	These sessions can add variety and interest to your schedule. Experiment with various distance/time combinations. Try combining flat and hill running. Eg: run 5mins at tempo on the flat, wait 1min then run a fast hill rep. Try sets of these. Experiment with recoveries as well: try a <b>diminishing recovery</b> session, eg: <i>12x200m – start with 1min 50 recovery and reduce by 10secs after each rep.</i> Try to run even paced on the 200m reps – see what happens to you rep times as recovery falls below 50secs!

## 2. The Long Run

### Why do long runs?

Firstly, let us define the long run. For this article, this a steady paced continuous run of approx double your average training run time, with a minimum of one hour.

Of course it is all relative, but for a runner who manages several runs of 30-45mins per week, the long run would be around 1hr 15.

Or, if you have a regular circuit which forms the bulk of your training, your long run might be to complete two laps instead of one.

We can also assume that as the marathon is the furthest popular distance run, 20miles would be the upper limit of a long run... Beyond this you are entering the realm of "ultra-distance" which is a whole new ball game.

Of the key sessions featured here, the long run is probably the most obvious inclusion. After all, the objective of most running schedule is to equip you to last longer at a certain pace. Even schedules with less obvious endurance objectives, such as those designed for middle distance events like the 800m will still contain heavy endurance elements. The 800m is still reckoned to be 50% aerobic (see the first article "Follow the Greatest")

So, going back to basics... these are some of the reasons why more, steady paced running in general is effective...

- It leads to an improvement in core fitness. This is sometimes expressed as your  $\dot{V}O_2\text{Max}$  - how efficiently your muscles use oxygen to produce energy
- Burns fat and improves metabolism
- Helps to control weight
- Stimulates the body to build greater muscular and structural strength and muscle mass
- Trains the nervous system towards a more efficient response – "muscle memory"
- Supposed to build bone density according to medical experts
- Improves gait and posture when running - leading to improvements in running economy

Improvements in all of these key elements lead ultimately to a stronger, more efficient, more economical, more fatigue resistant body, which in turn equals a body more capable of running longer and faster.

But why specifically the long run? What advantages does this have over running more, shorter distance runs?

Your own personal mileage volume will probably comprise mostly shorter runs of 20-50mins plus miles covered during specific sessions such as speed work, intervals and hills. However, the long run should be the cornerstone of your endurance strategy for the following reasons:

- There are different physiological and mental thresholds which the body will cross during a long run which it will usually never reach on your average training run:
  - Dehydration  
Probably the most significant risk to performance over longer distances can result from lack of adequate hydration during the run.  
Even at low temperatures and on rainy days, the body is consuming water to regulate temperature. The body can lose over 2 litres of water per hour in warm conditions.  
It would clearly be challenging to replace all of this lost water whilst running, so we have to expect that our supplies will deplete themselves as we go on.  
So the longer the run, the more water you will lose and the more profound will be the effect on your performance, in spite of your best efforts at taking fluids onboard.  
It follows then that to get used to the affects of mild dehydration and to practice taking on fluids during the run, you would need to do regular long runs.  
This is particularly important if you are planning a race over a long distance.

- Hitting the wall

When you begin exercising, the body will source most of its energy from muscle/liver glycogen stores and the metabolism of fat. Glycogen is the preferred source of the two as it is much more efficient to process.

Therefore the more intense the exercise, the greater will be the percentage of energy coming from glycogen consumption.

On average the body contains enough glycogen for around 2 hours of continuous activity.

Once this energy source has been depleted, the body will be solely reliant on fat metabolism. This key change can result in what is known as "hitting the wall" – a sudden energy loss with unpleasant symptoms of weakness and disorientation.

Hitting the wall can be controlled somewhat by the ingestion of energy drinks or gels during the run, and starting out at a lower intensity is said to reduce the sudden impact of hitting the wall... nevertheless, the body needs to be trained to handle this condition without compromising your ability to keep going.

Long runs are essential therefore for the body to get used to operating on low glycogen stores and for you to practice your re-fuelling strategy ahead of race day.

- Severe muscle fatigue

Towards the end of longer races, the muscles will begin to tire as the continuous breaking down of muscle tissue eventually takes its toll. This can result in often dramatic reductions in performance. Anyone who has struggled through the final 6 miles of a Marathon will testify to this.

Frequent longer runs will build resistance to this muscle fatigue as the body adapts to cope with this continuous stress.

- Mental fatigue

Maintaining concentration is crucial to maintaining performance during races or even steady runs. Longer runs will obviously require longer periods of concentration. You can often lose focus in a race some considerable time before your legs are ready to give in! Conquering this is a major advantage.

In addition, severe energy depletion and muscle fatigue will have an impact on your mental state through a consciousness that the body's response is deteriorating and energy levels are waning.

There are also physiological conditions which can have a direct affect on mental ability. In extreme cases, such as dehydration, the mental state can be severely impaired, as we often see with disorientated runners struggling to cross the finish line in most marathons.

(To demonstrate - next time you do a hard training run – try doing simple maths in your head at the same time!!)

- As part of an over and under distance strategy.

A popular strategy for training, (championed by many coaches and deployed effectively by Seb Coe), is to perform training sessions shorter and faster than your target distance and sessions which are longer and slower than your target distance. So for a 10k programme you would run distances less than 10k at 5k average pace and distances longer than 10k at, say, half marathon pace.

The same philosophy supporting this type of programme is applicable to doing long runs. You will undoubtedly churn out many steady runs or interval sessions covering distances up to your target event; so long runs will assist in balancing out the training effects.

## How to do long runs

Unlike shorter steady runs, long runs require more planning and preparation than simply putting on your trainers and heading out. In the section above we have seen the affects long runs can have on the body – we need to be ready to handle these situations and barriers when they arise:

### *Hydration*

Carrying fluid or having a pit stop point to take on fluid on a long run is the single most important thing you should do.

Most commonly this involves carrying a vessel with you – a small bottle or a specially adapted container which you can buy at most running shops.

Alternatively if you don't want the inconvenience of carrying a bottle, you could take money and plan to stop at a shop en route. Another option is to drive round your planned course and plant your drinks at selected points – although this strategy has obvious disadvantages. You should plan to replenish liquid at a good rate to maintain performance. In marathons, the recommendation is to take on fluid at every mile, so you can quickly see how much they recommend you consume.

The type of drink can vary – plain water, or sports drinks, incorporating an energy source are also an option.

**The golden rule is not to try anything new in a race.** Long training runs are a good opportunity to practice and discover your preferred strategy.

### *Nutrition*

For very long runs of well over an hour, it is recommended to take an energy source as well as fluids.

This could be a specialised gel or sports drink, but could also be anything containing glucose or simple sugar – jelly babies are a popular choice. Again the golden rule above applies...!

### *Equipment*

Long runs lead to more wear and tear on the skin as well as the muscles, so chaffing is a common problem. Using Vaseline, a sports lubricant product or sticky plasters on sensitive areas can stop some often severe discomfort towards the end of the run.

Blisters are also a common problem. Never wear brand new trainers or socks for long runs. If you are prone to blisters in one area, try applying sticky plasters before you set out.

Trainers should be suitable for higher mileage. Lighter weight racers are fine for races up to 10k, but beyond this you are running a risk of faster muscle fatigue not to mention injuries to joints if your shoes are not designed to give adequate cushioning.

With all equipment, again... the golden rule above applies!!

### *Routes*

Plan the route in advance to avoid getting lost or running too far (!), and ensure the route passes amenities if you feel it is necessary. Take money or a mobile phone with you in case of emergencies (e.g.: picking up an injury when you are 5 miles from home!)

For long runs, it is best to choose an off-road route to reduce the impact of a hard road surface on your muscles and joints. You will recover from the run much more quickly and be ready to train again sooner. Remember also that hills en route will make it harder.

### *Weather*

Be conscious of the weather conditions and the fact that they may change a lot over the course of your run. Is it likely to rain? Will it be dark by the end? Think about places on the run where you can stash extra layers or a rain jacket for instance – this could be the house of someone you know.

### *Example Long Runs*

Because long runs can have a longer lasting impact on the body and take longer to recover from than your usual steady runs, it is important to introduce them into the programme at the right point.

Try to schedule them when you have easy days either side and not on a day when you are likely to be busy outside of running – Sunday mornings are the most popular choices.

Try to do long runs earlier in the day as your energy stores will naturally be greater.

An experienced runner may do a long run once a week, but for most, once a fortnight is effective and gives time to recover from it and return to a period of usual training.

Long runs can also be combined with other training sessions – try stopping half way and running some light intervals or hill repetitions. Or when you have a tempo run planned, add an extended warm up and warm down to take the session into long run territory.

### **How Far? How Fast?**

We've defined a long run at the start of the article relative to your normal volume, but we can also define it relative to a typical training schedule. Here is a table with some recommendations on distance and pace of long runs for specific race targets:

Target Event	Long Run Strategy
<b>Up to 5k</b>	6-10 miles equivalent to your usual steady run pace (weekly/fortnightly)
<b>5M/10k</b>	8-10 miles equivalent to your usual steady run pace or 10-12 miles slower than your usual steady run pace (weekly/fortnightly)
<b>10M/Half Marathon</b>	10-12 miles equivalent to your usual steady run pace or 12-15 miles slower than your usual steady run pace (fortnightly - over 12 miles every 3 weeks)
<b>Marathon</b>	Build up to minimum of 18 miles over a 3 month period, running a long run every fortnight/3 weeks. Start at 10-12 and add 1-2 miles per 3 weeks. Run a shorter long run (as in 10M strategy) in between weeks.