

Middle and Long Distance Runners Lactate Profiling & Aerobic Capacity Assessment Package

The Ulster Sports Academy is offering a special winter assessment package, specifically designed for middle to long distance runners. The test procedures take approximately 1 hour 30 mins and will provide athletes with a very detailed report to boost winter training. The exercise component of the test is carried out on a state of the art H.P Cosmos treadmill. Athletes should abstain from strenuous exercise for 2-3 days before the test. They should arrive motivated, free from injury or illness and be well hydrated. The assessment is outlined into the following sections:

1. Anthropometric Measurements

This includes height, body mass and body composition analysis (body fat percentage). Body composition is analysed by using Harpenden skin-fold callipers. This technique requires pinching fat tissue at different sites of the body (figure 1) which allows determination of the percentage of body fat in the body.

Individuals can opt to have body composition analysed via bioelectrical impedance which is a less invasive method. It does not require the individual to remove clothing. Instead, a small electrical device is connected, by electrodes, to the hand and foot and readings are obtained in this way to estimate body composition.

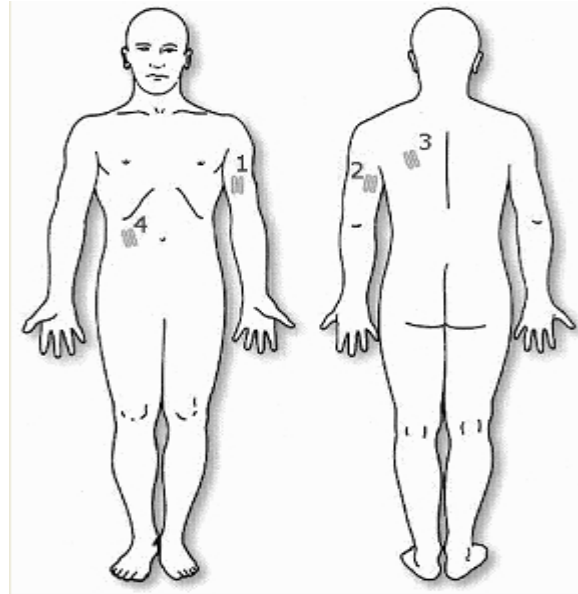


Figure 1: Four skin-fold site

Why is this important?

If you are carrying excessive body fat it will be counterproductive to endurance exercise performance. Basically, you are carrying deadweight that will slow you down and hinder performance.

2. Hydration Status

Athletes' hydration status is measured by analysing the concentration of a urine sample, using a micro osmometer.

Why is this important?

As little as 2% dehydration will negatively impact upon endurance performance. We can help you ensure you are drinking enough fluids.

3. Resting Blood Analysis

A small sample of blood is collected via a finger prick and analysed for haemoglobin content and haematocrit levels.

Why is this important?

Endurance athletes require haemoglobin molecules to carry oxygen to the working muscles. The haematocrit reading represents the percentage of formed elements in the blood (mainly red blood cells)

and it is important that these fall within a healthy range. If either haemoglobin or haematocrit levels are low an athlete may require an intervention to be actioned by their G.P.

4. Single Leg Strength

Maximal strength levels between the right and left leg will be assessed using a dynamometer.

Why is this important?

Runners may often have an imbalance in leg strength between right and left legs. Measuring single leg strength will establish if a strength & conditioning intervention is required.

5. Double Leg Power

Double leg power will be assessed via a countermovement jump using an electronic jump mat.

Why is this important?

Having superior levels of leg power is important for a runner. Tracking levels can provide information on the success or failings of a strength & conditioning programme and the whole training programme in general.

6. Single Leg Hamstring Flexibility

Using a goniometer we will assess hamstring flexibility with an active straight leg raise test.

Why is this important?

Hamstring flexibility is crucial for runners because it impacts upon stride length and can help to prevent low back pain. Additionally, if the hamstring muscle group is tight it will limit the exercises that an athlete can use for improving leg strength and power. It is a prerequisite to have adequate hamstring flexibility before using exercises such as squatting movements and Olympic lifts in a conditioning programme. These are the most effective exercises for developing strength and power that can improve performance. Measuring hamstring flexibility and using stretching interventions will ensure that the athlete has optimal flexibility.

7. Lactate Profile Assessment

Athletes will be put through a progressive exercise test to establish how their body responds to different exercise intensities. The response to exercise is measured by tracking the heart rate and blood lactate levels. Blood lactate is measured by taking capillary blood samples – this will require taking a very small sample of blood from either the tip of a finger or the ear lobe.

Why is this important?

This information will be used to structure heart rate training zones for 3-4 months. They will range in intensity and be specific to individual fitness levels. This procedure establishes individualised heart rate training zones for each athlete to train at, removing the guess work from training. This process will also establish your onset of blood lactate accumulation (anaerobic threshold) and give sub maximal exercise markers that are very important to distance running performance because they reflect the pace of most distance events. This is superior to structuring training from age predicted heart rate zones.

8. (a) Aerobic Capacity ($\dot{V}O_2\text{max}$)

This involves connecting the athlete to a gas analysis system that will calculate how much oxygen the body can extract and use during exercise.

Why is this important?

The higher these levels are the more an athlete is suited to endurance exercise. Runners with higher values are more suited to long distance running, whilst those with lower values will be more suited to middle distance events. Furthermore, improvements in the value will support the fact that your training is working and fitness levels improving. This part of the test requires you to really push yourself and we only conduct this with healthy and fit individuals.

(b) Running Economy

The results from this stage of the assessment will also be used to assess your running economy. This is a measure of how efficiently an athlete can run at different sub-maximal exercise intensities. This analysis can be used to establish appropriate run pace

Why is this important?

Athletes with good running economy will use less oxygen at a given exercise intensity. The analysis can also be used to establish appropriate run pace for first time marathon runners.

Participating in the analysis of sections 7 and 8 will provide very useful information to the athlete. It will highlight areas of weakness and establish if a runner needs more speed, strength and power training; to improve running economy and $\dot{V}O_2\text{max}$ or more distance running to improve sub maximal markers of endurance and race pace.

9. Recovery Training Session

After all your hard efforts relax in our recovery suite and soothe away your aches and pains.

Why is this important?

The recovery suite contains a steam room, ice cold plunge pool and warm Jacuzzi. Alternating between these treatments will accelerate recovery and have you feeling rejuvenated.

10. Report

The report will detail all of our findings and help you towards new found levels of performance.

The comprehensive support package is now available for £120 per person for tests carried out during the hours of 09.00-16.00 Monday to Friday and £140 for tests carried out in the evenings or at weekends. Discounts or free services (a running specific strength & conditioning programme) can be organised for clubs or groups who wish to book in a group of five or more individuals for the test package.

Why not give your winter training a boost and recruit the experts at the Ulster Sports Academy.

For further information or bookings contact Maria Faulkner, B.Sc., M.Sc. on 02890 368154 e mail m.faulkner@ulster.ac.uk

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For further information on the range of athlete support services from the Ulster Sports Academy, including nutritional, strength & conditioning or psychological support visit the website at <http://www.sportsulster.com/performanceservices.php>