The Importance of Fitness Testing

- Fitness testing is an important tool for coaches and performers.
- It can be used to test the baseline results of specific components of fitness and then be used to track progression in response to training.
- Coaches and performers can design training sessions based upon results; for example, if a fitness test highlights that an athlete needs to improve their speed, training can be adapted to include speed-training exercises such as hollow sprints or interval training.
- In addition fitness tests can be used to set goals as they provide athletes a target to aim for.

Pre-test Procedures

Informed consent:
All participants should give this before a fitness test because some tests require personal measurements to be taken, such as weight and height. Participants should sign a form that explains the test. If they are under 18 a parent or guardian should sign.

Calibration of equipment:
Equipment should be calibrated to ensure accuracy of results. This involves adjusting settings and ensuring it is measuring the correct units.

Interpreting Fitness Test Results

- It is important to be able to appropriately interpret your fitness test results so that it is possible to compare them with national averages, peers or teammates.
- This allows goals and targets to be set and also ensures that you are using the correct results from your fitness tests.
- Some tests are easier to analyse than others; for example, the *sit and reach test for flexibility* simply involves measuring the distance you have stretched (in cm or inches).
- However, other tests such as those used to calculate *aerobic endurance* require the data collected to be converted in order to obtain your results for VO_2 max.

It is important that measurements are accurate to ensure correct results. You should ask these questions before every test:

- Am I familiar with using the equipment?
- Can I get consistent results every time I run this test? (reliability)
- Is it practical for me to run this test?
- Is the test measuring the component of fitness it is meant to measure? (validity)
- Am I measuring using the correct units?
- Can I record the results immediately?

Interpreting Aerobic Endurance Test Results

Aerobic endurance tests are used to calculate an athlete's VO_2 max; however, they are initially measured using pulse rate (forestry step test) or level (multi-stage fitness test) and therefore need to be converted to calculate maximum oxygen uptake (ml/kg/min).

Forestry Step Test

In order to interpret the results of a forestry step test a table of aerobic fitness values, such as the one below, will need to be used. The table takes into account factors such as gender and weight in order to predict maximal oxygen consumption based upon pulse rate. The table below indicates VO_2 max based upon pulse rate for males:

Pulse Count	Maximal oxygen uptake (VO_2 max) (ml/kg/min)			
45	33	33	33	33
44	34	34	34	34
43	35	35	35	34
42	36	35	35	35
Weight (kg)	54.5	59.1	63.6	68.2

Worked Example

Using the table above, VO_2 max is calculated using the value that intersects the closest value to your weight and pulse rate.

e.g. A male who had a pulse rate of 42 and weighed 60 kg would have a VO_2 max of **35 ml/kg/min.**

Multi-stage Fitness Test

In order to interpret the results of a multi-stage fitness test a table of aerobic fitness values, such as the one below, will need to be used. The table takes into account the level and shuttle reached (the results of the fitness test) to predict maximal oxygen consumption. The table below shows how your test results can be interpreted (using level 8 as an example):

Maximal oxygen uptake (VO_2 max) (ml/kg/min)		
Level	**Shuttle**	**VO_2 max**
8	2	40.5
8	4	41.1
8	6	41.8
8	8	42.4

Worked Example

Using the table above, VO_2 max is calculated using the level and shuttle attained when performing the multi-stage fitness test.

e.g. If you were to achieve level 8, shuttle 4 on the multi-stage fitness test you would have a VO_2 max of **41.1 ml/kg/min.**

Interpreting Body Composition Test Results

Body Mass Index

In order to calculate body mass index an athlete's weight and height will need to be measured and the following equation used:

BMI (kg/m²) = Weight (kg) ÷ [Height (m) X Height (m)]

Worked example

If someone weighed 60 kg and was 1.60 m tall their BMI would be:

BMI (kg/m²) = 60 ÷ [1.6 X 1.6]

= 60 ÷ 2.56

= 20.4 kg/m²

This value can then be compared to national recommendations for a healthy BMI as shown in the table below:

Rating	BMI (kg/m2)
Healthy	20–25
Overweight	26–30
Obese	31 +

Therefore, the person in the worked example has a healthy BMI as 20.4 kg/m² falls between 20–25 kg/m².