

Principals of training

Objectives of training programmes

Training programmes are created to prepare athletes for competition. It is designed to improve their performance, skill, motor fitness, physical fitness and ability. To do this you need to use these principles of training:

Individual response

This is dependant on many aspects such as gender, age, and trained/untrained.

Progressive overload

Progressive overload is where the workload is increased gradually to help with physical modification according to the intensity, duration and type of training undertaken.

Recovery

Fitness gains are produced during rest periods as well as in training. Only during a subsequent rest intervals prior to the next training session will the benefits be demonstrated. Rest and recovery can take several forms. Aerobic runs and cross training activities such as cycling can allow the body rest if they are not too demanding and different from the normal high intensity training activities. Such work should be performed at a high level well below normal training and competition activity.

The use of a heart rate monitor allows you to consider variations in resting heart rate that may indicate insufficient recovery from a previous training session or competition, or even the onset of illness. Similarly such monitors may allow you to regulate the training load to a set percentage of maximum capacity. This can prevent the unnecessary overload of an already stressed body. (See over-training). Rest must be a key feature of any training programme.

Specificity

The design of exercise and training programmes must be specific to the sport or activity to be undertaken. Specificity means that not only must training be sport specific but the relevant components of fitness must be trained appropriately and at the relevant time of the competitive season.

Reversibility and moderation

Reversibility concerns the effects of de-training. If you take too long to rest or recover between exercise bouts or sessions, the physiological adaptations you have gained will be lost. This is because the homeostatic mechanism readjusts the body's systems to the decreased demands being placed upon it. This is also called regression.

Through moderation of training, the training and recovery period are balanced to allow the body a sufficient time for recovery without losing the benefits of training.

Over-Training

Long periods of intense training with poor and or little recovery will lead to conditions of over-training and or burnout. Physiological indicators of over-training may appear as:

- Increased resting heart rate
- Rapid unexplained weight loss
- Prolonged loss of appetite
- Excessive muscle fatigue or soreness
- Susceptibility to injury
- Frequent colds, infection, allergic reactions
- Sleep disturbances
- Lack of motivation to train

FITT Principles

The acronym FITT (frequency, intensity, time (or duration), type) embodies the basic principle of fitness training. How often, how hard, for how long and for what type of training is appropriate or required by the individual to perform more effectively? The many texts on training recommend a range of programmes for the components of fitness based on these principles.

Continuous Training

A practical example of continuous training includes long slow distance running (LSD). By establishing target training zones and individual can exercise or train at the most relevant intensity. By varying these training zones from day to day, not only are you allowing recovery from more intensive runs, but also challenging your body to improve.

Target Training Zones

The Finnish Physiologist Karvonen first presented target -training zones. They were based on Karvonen's Principle of working at a given percentage of maximum heart rate in relation to an individual's age. The basic formula for calculating maximum heart rate is:

$$\text{Max HR} = 220 - \text{age}$$

The heart rate calculated using this formula is then used to estimate the heart rate percentage-training load for the individual.

Warm-up

The sporting body will not perform effectively if it is not operating at the optimum temperature for its systems to function at their best. As resting body temperature rises the rate of chemical reactions increase (catalysis). Warm

up should therefore be gradual and initially of low intensity, leading in to the more intense level of the activity.

Warming up is all about peak performance preparation, it is there to prepare the athlete mentally as well as physically, and it has immediate effects on the performer. The warm up should be specific to the activity.

Cool-down

Just as the body needs to prepare for exercise, it also needs to be given the opportunity to readjust to a normal resting state at the end of it. A gradual reduction in intensity of activity after cessation of exercise allows the body systems to recover as efficiently as possible.

Cool down should consist of active recovery exercises of decreasing intensity and stretches. As well as a return to a normal resting state, it also allows the following adjustments to take place progressively and safely:

- A slow decrease of the cardiovascular and respiratory rates.
- A slow decrease of the metabolism.