

Adrenaline

Natural hormone released to speed heart rate up.

Aerobic

With oxygen. When exercise is not too fast and is steady, the heart can supply all the oxygen that the working muscles need.

Summarised as:

glucose + oxygen → energy + carbon dioxide + water.

Aerobic training zone

The aerobic training zone allows the aerobic system to be trained. To define aerobic training zone:

1. Calculate maximum heart rate (220bpm) minus age: $220 - \text{age}$
2. Work at 60-80% of maximum heart rate.

Agility

The ability to move and change direction quickly (at speed) whilst maintaining control.

Agonist (prime mover)

Muscle or group responsible for the movement.

Altitude

A geographical area (of land) which is over 2,000m above sea level

Altitude Training

Training at altitude where there is less oxygen. The body adapts by making more red blood cells to carry oxygen. The additional oxygen carrying red blood cells is an advantage for endurance athletes returning to sea level to compete

Altitude Sickness

Nausea caused by training at
altitude

Alveoli

Air sacs in the lungs

Anaerobic

Without oxygen. When exercise duration is short and at high intensity, the heart and lungs cannot supply blood and oxygen to muscles as fast as the respiring cells need them.

Summarised as:

glucose → energy + lactic acid.

Antagonist

Acts to produce the opposite action to the agonist. They work in antagonistic pairs.

Articulating bones

Where two or more bones meet to allow movement at a joint

Axis

Imaginary line through the body around which it rotates. Types of axis:

- longitudinal (or vertical) – head to toe
- transverse – through the hips
- sagittal – through the belly button

Backflow

The flowing backwards of blood.
Valves in the veins prevent this
from happening.

Balance

The maintenance of the centre of mass over the base of support. Reference can be made to whilst static (still) or dynamic (whilst moving).

Blood pressure

The pressure that blood is under.

Types of pressure:

- systolic - when the heart is contracting
- diastolic - when the heart is relaxed.

Cardiac Cycle

The process of the heart going through the stages of systole and diastole in the atria and ventricles

Cardiac output

The amount of blood ejected from
the heart in one minute

or

stroke volume x heart rate

Cardio-vascular endurance

Also known as **AEROBIC POWER**

The ability of the heart and lungs to supply oxygen to the working muscles.

Circuit training

A series of exercise stations whereby periods of work are interspersed with periods of rest.

Closed Season

Post (transition). It is defined as:

- Period of rest to recuperate
- Players doing gentle aerobic exercise to maintain general fitness
- Fully rested and ready for pre-season training

Coordination

The ability to use different (two or more) parts of the body together, smoothly and efficiently.

Competitive Season

Also known as Peak Season. It is defined as:

- Playing season
- Taking part in matches every week
- Maintenance of fitness related to the activity but not too much training as it may cause fatigue, which would decrease performance
- Concentration on skills/set plays to improve team performance

Continuous training

Involves working for a sustained period of time without rest. It improves cardio-vascular fitness. Sometimes referred to as a steady state training.

Delayed onset of muscle soreness

(DOMS)

The pain felt in the muscles the day after exercise.

Embolism

Blockage of a blood vessel.

Excess Post-Exercise Oxygen Consumption (EPOC)

Sometimes referred to as oxygen debt (now an outdated term), EPOC refers to the amount of oxygen needed to recover after exercise. EPOC enables lactic acid to be converted to glucose, carbon dioxide and water (using oxygen). It explains why we continue to breathe deeply and quickly after exercise

Expire

Breathe out

Fartlek training

Swedish for 'speed play'.

Periods of fast work with intermittent periods of slower work. Often used in running, ie sprint, jog, walk, jog, sprint, etc.

Fatigue

Either physical or mental, fatigue is a feeling of extreme or severe tiredness due to a build-up of lactic acid or working for long periods of time

Fitness

The ability to meet/cope with the demands of the environment

FITT

FITT is used to increase the amount of work the body does, in order to achieve overload.

FITT stands for:

- frequency – how often you train
- intensity – how hard you train
- time – the length of the training session
- type – the specific method, eg continuous training

Flexibility

The range of movements possible
at a joint.

Haemoglobin

The substance in the red blood cells which transports oxygen (as oxyhaemoglobin) and carbon dioxide

Health

A state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity.

Heart attack

It occurs when the flow of oxygen-rich blood to a section of heart muscle suddenly becomes blocked.

Heart chambers

They include the right and left atria
and ventricles

Heart rate

The number of times the heart beats (usually measured per minute)

High intensity interval training (HIIT)

It's an exercise strategy alternating periods of short intense anaerobic exercise with less intense recovery periods (see interval training)

Hypertension

High blood pressure in the arteries

Hypertrophy

The enlargement of an organ or tissue from the increase in the size of its cells.

Inspire

Breathe in

Interval training

Periods of training/work that are followed by periods of rest, eg
work, rest, work, rest

Isometric contraction

Muscle contraction where the length of the muscle does not alter.
The contraction is constant, ie pushing against a load

Isotonic contraction

Muscle contraction that results in limb movement:

- Concentric contraction – shortening of the muscle
- Eccentric contraction – lengthening of the muscle

Lever

A rigid bar (bone) that turns about an axis to create movement. The force to move the lever comes from the muscle(s).

Each lever contains:

- a fulcrum - fixed point, effort (from the muscle(s) to move it)
- load/resistance (from gravity).

Maximal heart rate

Calculated by: $220 - \text{age}$

Mechanical advantage

The efficiency of a working lever,
calculated by:

effort \div weight (resistance) arm

Movement at a joint

Classified into:

- Flexion – decrease in the angle of the bones at a joint
- Extension – increasing the angle of bones at a joint
- Abduction – movement away from the midline of the body
- Adduction – movement towards the midline of the body
- Rotation – movement around an axis
- Plantar flexion – pointing the toes at the ankle/increasing the ankle angle
- Dorsi flexion – toes up at the ankle/decreasing the ankle angle
- Circumduction – turning or circular motion around a joint (which occurs in more than one plane)

Muscular endurance

Ability of a muscle or muscle group to undergo repeated contractions, avoiding fatigue

One rep max

The maximal amount that can be lifted in one repetition by a muscle/group of muscles (with the correct technique)

Physiology

Study of how our cells, muscles and organs work together, and how they interact.

Plane

Imaginary lines depicting the direction of movement.

Types of planes:

- sagittal - forwards and backwards
- frontal - left or right
- transverse - rotation around the longitudinal axis

Post Season (transition)

Period of rest/active recovery/light aerobic work after the competitive period (season)

Power/explosive strength

The product of strength and speed,
i.e.
 $\text{strength} \times \text{speed}.$

Pre-Season (preparation)

It is defined as:

- Period leading up to competition
- Usually using continuous/fartlek/interval training sessions to increase aerobic fitness
- Weight training to build up strength and muscular endurance
- Developing techniques specific to the sport in order to be fully prepared for matches at the start of the season and therefore be more successful

Principles of overload

Frequency, intensity, time and type
(see FITT).

Principles of training

Specificity, progressive overload,
reversibility and tedium

Prime mover (agonist)

Muscle or muscle group
responsible for the movement.

Pulse Raiser

Any activity that raises heart rate.
Usually as part of a warm up, eg
light jog

Qualitative

More of a subjective than an objective appraisal. Involving opinions relating to the quality of a performance rather than the quantity (eg score, placing, number)

Quantitative

A measurement which can be quantified as a number, eg time in seconds or goals scored. There is no opinion expressed (qualitative). It is a fact

Reaction time

The time taken to initiate a response to a stimulus, i.e. the time from the initiation of the stimulus (e.g. starting gun in 100 m) to starting to initiate a response (e.g. starting to move out of the blocks in 100 m).

Recovery

Time required to repair the damage to the body caused by training or competition

Reliability

Relating to the consistency and repeatability of a test (ie to produce the same or similar scores)

Repetitions

The number of times an individual action is performed. A set is a group of repetitions

Residual volume

Volume of air left in the lungs after maximal expiration.

Season

A period of time during which competition takes place or training seasons, dividing the year up into sectional parts for pre-determined benefits. Training seasons include:

- Pre-season (preparation)
- Competition season (playing)
- Post-season (transition)

Skeletal system

Skeletal system provides a framework of bones for movement, in conjunction with the muscular system

Speed

The maximum rate at which an individual is able to perform a movement or cover a distance in a period of time, putting the body parts into action as quickly as possible.

Calculated by: distance ÷ time

Spirometer trace

A measure of lung volumes, which include:

- Tidal volume – volume of air inspired or expired/exchanged per breath
- Inspiratory reserve volume – the amount of air that could be breathed in after tidal volume
- Expiratory reserve volume – the amount of air that could be breathed out after tidal volume
- Residual volume – the amount of air left in the lungs after maximal expiration

Specificity

Making training specific to the sport being played/movements used/muscles used/energy system(s) used.

Progressive overload

Gradual increase of the amount of overload so that fitness gains occur, but without potential for injury.

Overload is the gradual increase of stress placed upon the body during exercise training (more than normal

Reversibility

Losing fitness levels when you stop exercising.

Tedium

Boredom that can occur from training the same way every time.
Variety is needed.

Static stretching

Holding a stretch
still/held/isometric

Strength

The ability to overcome a resistance. This can be explosive, static or dynamic:

- explosive – see Power
- static – static ability to hold a body part (limb) in a static position. Muscle length stays the same/maximum force that can be applied to an immovable object
- dynamic – see Muscular endurance for similarity

Stroke volume

The volume of blood pumped out of the heart by each ventricle during one contraction.

Sub-maximal

Working below maximal intensity
level

Suppleness

As with flexibility, the range of movement possible at a joint

Synovial joint

An area of the body where two or more bones meet (articulate) to allow a range of movements. The ends of the bones are covered in articular cartilage and are enclosed in a capsule filled with fluid. For the purposes of this specification, the following structural features and roles should be known:

- Synovial membrane – secretes synovial fluid
- Synovial fluid – provides lubrication
- Joint capsule – encloses/supports
- Bursae (sacks of fluid) – reduce friction
- Cartilage – prevents friction/bones rubbing together
- Ligaments – attach bone to bone

Target zone

The range within which athletes need to work for aerobic training to take place

(60-80% of maximum heart rate).

Training

A well-planned programme which uses scientific principles to improve performance, skill, game ability, motor and physical fitness

Training Thresholds

The actual boundaries of the target zone

Validity

The extent to which a test or method measures what it sets out to measure

Viscosity

Thickening of the blood

Weight training

The use of weights/resistance to cause adaptation of the muscles.