

TERMINOLOGIES

A

Abdomen

That part of the body containing the viscera, ie the kidneys, liver, stomach, and intestines; separated from the thorax by the diaphragm.

Acetylcholine

A chemical (neurohormone) released from presynaptic nerve endings, which diffuses across the synapse (gap between the neurones) and stimulates the initiation of an impulse in the post-synaptic membrane. Is rapidly broken down by the enzyme cholinesterase.

Acid

A chemical which dissociates ("splits up") in solution to give hydrogen ions (H^+). Have a Ph less than 7. Neutralised by alkalis (bases).

Adenosine Triphosphate (ATP)

A compound formed from ADP + P with energy released from Phosphocreatine (PC) and/or the breakdown (oxidation – either aerobic or anaerobic) of energy rich substrates e.g. glucose. Stored in all cells, especially muscle fibres. When it is broken down by enzyme action back into ADP + P the stored energy is made available for chemical or mechanical work. All the body's energy

use is via ATP, which is continually broken down and resynthesised (average daily turn-over = body weight).

Adipose tissue

Special tissue within which fat is stored. Found mainly under the skin (sub-cutaneous) and around the major organs.

Adolescence

The period in which a second growth spurt occurs and sexual maturity is achieved.

Adrenal glands

Literally “on top of the kidneys”. Composed of two distinct regions, an outer cortex, and an inner medulla. The cortex secretes adrenal cortical hormones, e.g. sex hormones, aldosterone, cortisol; the medulla secretes adrenaline and noradrenaline, and is closely linked to the sympathetic nervous system.

Adrenaline

A hormone (chemical transmitter substance) released from the medulla of the adrenal glands and from sympathetic nerve endings, which prepares the body for “fight or flight” as a result of a “fright”.

Aerobic Exercise

Exercise during which the energy needed is supplied by

aerobic respiration (oxidation) of energy rich substrates e.g. glucose, using the oxygen that is breathed in (fats can only be broken down aerobically). Such exercise can be continued for long periods.

Affinity

Attraction to, "liking" for; e.g. haemoglobin has an affinity for oxygen, with which it forms oxyhaemoglobin.

Alactacid (alactate) Oxygen Debt (alactic recovery oxygen consumption)

The oxygen necessary after exercise to replenish the ATP-PC energy stores, and to resaturate the myoglobin and tissue fluids with oxygen.

Alkali (or base)

A chemical which accepts hydrogen ions, thus neutralising acids. Have a Ph greater than 7.

Amino Acids

Organic acids containing nitrogen. Proteins are made up of long chains of amino acids joined by peptide bonds. The body must be supplied with amino acids in the diet. There are 20 different types of amino acids in proteins of living origin. "Non-essential" amino acids are necessary for body function but can be produced in the body by interconversions (trans-amination) of other amino acids; about 11 so called "essential" amino acids are not produced by conversion in the body (at least not at a fast enough rate to satisfy

demand) and must be obtained via the diet. Amino acids excess to the body's needs cannot be stored and are converted into glucose which is used as an energy source, and urea which is excreted in the urine, and incidentally in the sweat (especially during exercise when the kidneys have a reduced blood supply).

Amphetamine

A synthetic central nervous system stimulant related to adrenaline.

Anabolic Steroids

A group of ergogenic aids (related to the male hormone testosterone) that have an anabolic (protein building) effect, and to a greater or lesser extent an androgenic (development of male characteristics) effect on the body.

Anabolism

That aspect of metabolism involved in the building up (synthesis) of complex substances (e.g. proteins) from simpler substances (e.g. amino acids). Requires energy in the form of ATP.

Anaerobic Exercise (respiration)

Exercise that demands more oxygen than can be supplied at the time, and which therefore results in the depletion of ATP-PC stores, and the incomplete oxidation of glucose with the accumulation of lactic acid.

Anaerobic Glycolysis

The initial stages in the oxidative breakdown of glucose in the cytoplasm of cells and muscle fibres, which does not directly involve oxygen, generates a relatively small amount of ATP from each glucose molecule very rapidly, and which in the shortage of oxygen leads to the accumulation of lactic acid.

Anaerobic Threshold

The “point” at which, during exercise, the oxygen supply becomes insufficient to maintain aerobic respiration, so that anaerobic respiration becomes predominant, with the accumulation of lactic acid in the blood. Less used than previously, as always overlap between aerobic and anaerobic respiration systems in all types of exercise complicate the idea of a simple “threshold”.

Analgesic

Pain killer e.g. aspirin.

Anoxia

Lack of oxygen in tissues.

Arterioles

Finer branches of arteries, with relatively narrow diameters, and involuntary muscle in their walls, the contraction of which leads to vasoconstriction, and the relaxation of which leads to vasodilation. When constricted (narrowed) there is a greater resistance to the flow of the blood and a raised blood pressure, and

vice-versa. Lead into the capillary beds.

Arterio-venous oxygen difference (a- V_{O_2} diff)

The difference in oxygen content between the blood entering and that leaving the pulmonary capillaries.

Artery

Blood vessels carrying blood away from the heart, eventually dividing into arterioles.

Articulate

To connect by means of a joint.

ATP-PC System (phosphagen system)

An anaerobic energy system in which ATP is regenerated from the breakdown of phosphocreatine (PC). Muscles performing at maximal effort obtain ATP from this system.

Atrophy

Reduction in size and/or mass of cells and tissues, especially relating to muscle fibres.

Autonomic

Self-controlling; functionally independent of voluntary control.

Autonomic Nervous System

That part of the nervous system which works involuntarily (is not under voluntary control), controlling all the autonomic processes in the body, e.g. breathing rate, heart rate, peristalsis in the gut, contraction of the bladder, dilation and constriction of the pupil of the eye. Consists of two opposing (antagonistic) sub-systems, the sympathetic and parasympathetic nervous systems.

B

Basal Metabolic Rate

The rate of the metabolism, as measured by the energy output of an individual, whilst at rest in optimum conditions 12-18 hours after eating (post-absorptive period).

Biopsy

The extraction of small pieces of tissues for chemical and/or histological studies, e.g. muscle biopsy to study fibre composition, using a hollow needle.

Blood Pressure

The pressure exerted by the blood on the wall of a blood vessel, a function of cardiac output and peripheral resistance (the resistance to flow of the blood in the blood vessels, mainly the arterioles).

Bradycardia

Resting heart rate slower than average.

Buffering capacity

The capacity to prevent changes in pH.

Buffers

Substances which can prevent rapid changes in pH (acidity and alkalinity) within the body, e.g. proteins in the plasma, and haemoglobin in the red cells of the blood.

C

Calorie

A unit of heat. A thousand so-called small calories equals one large Calorie (kilocalorie or kcal), which is the type used when speaking of human nutrition. 1 Calorie = 4186 joules (4.186 kJ).

Carbohydrates

Organic compound containing only carbon, hydrogen and oxygen in a characteristic ratio, e.g. starch, sucrose (table sugar), and glucose. They are a basic source of energy, circulating as glucose in the blood stream, and being stored as glycogen in virtually all body tissues, but mainly in the liver and muscles. Bread, potatoes, fruits, honey and refined sugars are all excellent sources of carbohydrates. Carbohydrates yield about four Calories per gram when oxidised.

Cardiac Output

The amount of blood in dm³ (litres), pumped by the heart per minute, a function of heart rate and stroke volume. Generally the outputs of the right and left ventricles are the same.

Catabolism

That aspect of metabolism involved in the breakdown of complex substances into simpler substances. For example the oxidation of glucose into carbon dioxide and water (with the release of energy) in aerobic respiration.

Central nervous system

The brain and spinal cord.

Chemoreceptors

Receptors sensing changes in the chemical composition of body fluids e.g. blood glucose levels.

Complete Protein (protein of high biological value)

Protein that contains all of the essential amino acids, e.g. eggs (which contain them in the ratio closest to that of human requirements), cheese, milk, meat, whole grains, and soya beans.

Concentric contraction

Contraction of a muscle reducing its length.

Connective Tissue

Tissues that provide support and cohesion for the body, e.g. white collagen fibres which form tendons, the basis of bone, and fibrous cartilage; yellow elastic fibres which form ligaments, and the basis of elastic cartilage; bone and cartilage. Others form sheets or mesenteries which hold organs in place.

Core Body Temperature

The central body temperature, as opposed to that of the limbs, the temperature of which is lower due to their greater surface area to volume ratio.

Coronary

Relating to the blood vessels that supply the cardiac muscle of the heart wall (from their “crown” like arrangement around the heart).

D

Dehydration

Excessive loss of water, during exercise mainly as a result of sweating.

Diastole

Relaxation, as in relaxation of the ventricles (ventricular diastole).

Diffusion

The net movement of gases or dissolved substances, as a result of their kinetic energy, from regions of their higher concentration to regions of their lower concentration, down a concentration gradient, until equilibrium is reached.

E

Eccentric contraction

Contraction of a muscle whilst the length of the muscle increases, e.g. the contraction of the quadriceps in the front of the thigh whilst running downhill.

Electrolytes

Substances that dissociate into ions in solution (ionize). See inorganic ions/mineral salts.

“Empty” Calories

Calories obtained from foods such as sugar, which are virtually devoid of dietary essentials like amino acids, vitamins and minerals.

Endocrine glands

Ductless glands that produce and release (secrete) hormones directly into the blood, e.g. pituitary gland, adrenal glands, thyroid gland.

Energy

Energy can neither be created nor destroyed. In metabolism, energy in chemical compounds is trapped eventually in ATP, and then either used in synthetic reactions e.g. protein synthesis in growth, or in the sliding filament mechanism in contracting muscle fibres etc.; ultimately all energy is lost as heat.

Epithelium

A tissue lining a body surface, e.g. the lungs.

EPOC

Excess post exercise oxygen consumption, the oxygen taken up after the end of a period of exercise. To be preferred to "oxygen debt", as not all the extra oxygen taken up after a period of exercise excess to normal needs is "a debt" as such resulting from under supply during the period of exercise.

Ergogenic Aids

Substances, other than naturally occurring foods, that when taken orally or by injection will increase the potential for exercise performance, e.g. anabolic steroids.

Ergometer

A stationary cycle used for training or for laboratory tests to measure work performed.

F

Fast-Twitch (FT) Muscle Fibres

They have a contraction speed 2-3 times faster than slow-twitch (ST) fibres, and are capable of producing more power than ST fibres.

Fat (lipid)

Fat acts as an energy store, contains fat soluble vitamins, provides heat insulation under the skin (sub-cutaneous), and support and protection for organs. Fat supplies about nine Calories per gram when oxidised. Fat can only be oxidised aerobically.

Fatigue

A subjective experience, not amenable to objective testing, but clearly understood by all sportspersons.

Fatty acids

Long chain organic acids which are one of the end products of the digestion of fats (glycerol being the other), which can be oxidised aerobically as a source of energy, or which can be resynthesised back into fats stored in adipose tissue. Some are essential for certain key metabolic processes e.g. the proper functioning of the nervous system, and must be supplied in the diet (the essential fatty acids).

Fulcrum

The axis of rotation for a lever

Functional residual capacity (FRC)

The volume of air left in the lungs when the respiratory muscles are relaxed.

G

Glucose (blood sugar)

The simplest carbohydrate in the body (a monosaccharide or “single sugar”). It may be oxidised aerobically to carbon dioxide and water, or anaerobically to lactic acid. It is the sole source of energy for the nervous system. It may be converted into glycogen or fat.

Glycogen

The form in which carbohydrate is stored in the body, mainly in the muscles and the liver, sometimes known as “animal starch”.

Glycolysis

The first stages of cellular respiration occurring with or without the presence of oxygen, in which glucose is converted to two molecules of pyruvic acid.

H

Haemoglobin

The iron-containing pigment in the red blood corpuscles (erythrocytes) that combines with oxygen to form oxyhaemoglobin.

HDL / Homeostasis

The maintenance of constant internal conditions (mainly of the body fluids) in the face of changing activity and external conditions, to provide optimum conditions for enzyme activity of metabolism. Controlled by negative feed-back loops, in which any change away from the “goal state” is opposed. The “ideal state” is never reached, and the metabolism fluctuates or “hunts” around the optimum within narrow limits, meaning that homeostasis is a dynamic equilibrium, never a static state.

Hormones

Chemical “messengers” secreted by ductless endocrine glands directly into the blood, which in small amounts stimulate specific processes of metabolism in “target” organs or tissues, usually at a distance from their site of production and secretion.

Hyperglycaemia

Higher blood glucose level than normal

Hypertension

High blood pressure.

Hypertrophy

Increase in the size and/or mass of cells and tissues, especially relating to muscle fibres.

Hyperventilation

An excessive increase in the rate of breathing, which causes a decrease in the amount of carbon dioxide in the blood, resulting in giddiness, cramps, convulsions, lowered blood pressure, and anxiety.

Hypoglycaemia

Lower blood glucose level than normal.

Hypothermia

Body temperature below normal.

Hypoxia

Low oxygen in the inspired air.

I

Incomplete Protein (protein of low biological value)

Protein that lacks one or more of the essential amino acids e.g. much vegetable protein.

Insulin

Hormone secreted by patches of endocrine cells in the pancreas. Opposes any rise in blood glucose by suppressing breakdown of liver glycogen to blood glucose, and stimulating formation of muscle glycogen from blood glucose. Also has a role in protein synthesis. The actions of insulin are opposed by the hormones glucagon and adrenaline.

Interval Training

A system of training in which intervals of hard exercise are alternated with easier recovery intervals.

Isokinetic Exercise

Contraction of a muscle at constant speed, whilst exerting maximum tension over the full range of movement at all joint angles, rarely achieved without special equipment.

Isometric Exercise

Contraction of a muscle in which shortening is prevented, e.g. when straining against an immovable resistance.

Isotonic drink

Being of the same concentration as the blood.

Isotonic Exercise

Contraction of a muscle during which the force of resistance

to the movement remains constant throughout the range of motion.

J

Joint Provision

The providing of new facilities for the shared use of different groups, eg. school, and public.

Joule

A measure of energy. 4.2 joules = 1 calorie.

K

Kinaesthetic Feedback

The provision of feedback from proprioceptors (internal sense organs) about the position and movement of the body.

Kilocalorie (Kcal)

a unit of work or energy equal to the amount of heat required to raise the temperature of one kilogram of water one degree Celsius

Kinesiology

Scientific study of human movement. Includes such aspects of study as ex phys, motor learning/control, and biomechanics

Krebs cycle

A series of chemical reactions occurring in mitochondria, in

which carbon dioxide is produced and hydrogen ions and electrons are removed from carbon atoms (oxidation). Also referred to as the tricarboxylic acid cycle (TCA), or citric acid cycle

L

Lactic Acid (lactate)

Formed in exercising muscles under anaerobic conditions. It causes the muscular pain associated with intense exercise. It is not a waste product, as it is oxidised as an energy source when oxygen is available. The alternative term "lactate" is strictly more accurate, as all acids exist in solution in the dissociated form, that is the molecule of lactic acid "splits up" releasing positively charged hydrogen ions, and the remainder of the molecule, which is negatively charged, is the lactate ion.

Lactic Oxygen Debt

The oxygen necessary after strenuous exercise to remove lactic acid from the blood

LDL

Low Density Lipoproteins, cholesterol is considered the "bad" cholesterol, because it contributes to fatty build ups in arteries

Ligament

Elastic tissue joining bones to bones.

Lymph

Plasma, minus plasma proteins, is exuded (pushed) through the capillary walls by the blood pressure and bathes the tissues as “tissue fluid”, which is drained into the lymphatic system, where white cells known as lymphocytes are added by the lymph glands that occur throughout the system. The fluid is now known as lymph. It is returned to the circulatory system in the neck region. The lymphocytes help fight infection, if the lymph glands become infected, they become swollen and painful (hence “glandular fever”).

M

Maximal Oxygen Consumption ($V_{O_2 \max}$)

The maximum amount of oxygen that an individual can consume in one minute. The figure may be expressed in dm³ (litres) of oxygen per minute, or more commonly in body weight bearing sports, e.g. running, in centimetres cubed (cm³) of oxygen per kilogram of body weight per minute. Remember the dot over the V represents “per minute”.

Metabolism

All the chemical processes involved in maintaining life.

Minerals (inorganic ions, mineral salts, electrolytes)

Chemically simple substances that are essential constituents of all cells. Minerals play an important role in water balance (osmoregulation), regulation of blood volume, maintenance of

proper acid-base balance, and all body functions eg calcium is essential for muscle contraction, and sodium and potassium are essential for nerve impulse transmission. Mineral salts are lost daily in the sweat and urine and must be replaced through the diet.

Mitochondria

Microscopic structures (from 0.001 mm – 0.4 mm) in cells and muscle fibres, just visible under the highest magnification of the light microscope. Centres of aerobic respiration using oxygen, regenerating ATP, and producing carbon dioxide and water as end products of the oxidation of glucose.

Monosaccharide

Literally “single sugar”, the simplest type of sugar molecules e.g. glucose.

Motor unit

All the muscle fibres supplied (innervated) by a single motor neurone.

Myogenic contraction

Initiating contraction without nervous stimulation, although nervous stimulation and hormones are involved in co-ordination and determining rate, e.g. cardiac muscle, and involuntary muscle in the wall of the gut.

Myoglobin

“Muscle haemoglobin”, an iron containing muscle pigment, that when oxygenated acts as an oxygen storage compound in Slow Twitch muscle fibres, imparting a red colour, hence red muscle fibres.

N

National Curriculum

Programmes of study and attainment targets laid down by the Government, stating what pupils must study from the time they enter primary school, to when they take GCSE in year 11. It is divided into 4 Key Stages, and Maths, English, Science are the core subjects.

Neuroticism

A personality factor (trait) which involves sensitivity, anxiety and insecurity.

Newton’s Third Law

To every action there is an equal and opposite reaction.

O

OBLA

Onset of blood lactate accumulation. Although there are normally traces of lactate in the blood, it is generally agreed that a level of about 2 – 4 millimoles per dm³ (litre) represents OBLA, which correlates to the term “anaerobic threshold”.

Optimum

The best possible.

Osmosis

The passage of water from regions of high water potential (pure water or more dilute solutions) to regions of low water potential (more concentrated solutions), across a partially permeable membrane (one that is more permeable to water than to dissolved substances (solutes)), down a water potential gradient until an equilibrium is reached. It is the special case of the diffusion of water. Sea water is more concentrated than blood, therefore if it is swallowed water moves from the blood and tissues by osmosis into the sea water in the gut. Fresh water is less concentrated than blood, therefore when drunk it moves by osmosis from the gut into the blood.

Oxidative potential

The ability to use oxygen in aerobic respiration.

Oxygen Debt

The amount of oxygen required to repay the oxygen deficit, by the removal of lactic acid and other metabolic products that accumulate when the supply of oxygen was below the needs of the individual during intense activity.

Oxygen Deficit

The amount of oxygen that the body is undersupplied with

during a period of intense exercise, when oxygen consumption does not equal what is necessary to supply all the ATP from aerobic oxidation, during which time energy is partially supplied from anaerobic stores.

P

Parasympathetic nervous system

The part of the autonomic (involuntary) nervous system responsible for promoting normal relaxed functioning. Antagonistic to the sympathetic nervous system, e.g. the sympathetic nervous system stimulates an increase in the heart rate, and the parasympathetic nervous system decreases the rate. Partial pressure In mixtures of gases, e.g. air, each substance exerts a partial pressure proportional to its concentration in the mixture. This pressure arises from continuous random movements that all gas particles exhibit.

pH

A measure of acidity or alkalinity, pH 7 is neutral, increasing acidity is expressed as a number less than 7; increasing alkalinity as a number greater than 7. The normal pH of blood plasma is 7.35-7.45.

Phosphagen system

The energy system involving ATP and phosphocreatine (PC). Stores of ATP and PC are exploited first in explosive exercise in what is known as the alactic anaerobic system.

Phosphocreatine (creatine phosphate)

Energy rich phosphate containing substance used as an immediate source of energy in the regeneration of ATP. Phosphocreatine itself can only be regenerated when there is an excess of ATP.

Physical Fitness

The capacity to perform physical activity with relative success and enjoyment without undue discomfort during or after. This normally involves a measure of the relative efficiency of the heart, blood vessels, lungs and muscles, in carrying out movements. In hard physical activity the enjoyment involves knowing that achieved aims.

Plyometrics

Maximum concentric effort made immediately following an eccentric phase. In simpler terms bounding, hopping, and rebound jumping.

Power

The rate of doing work; the rate of transfer of energy. It is defined in watts (W). 1 watt = 1 joule per second.

Proprioceptors

Internal sensory organs found in muscles, joints and tendons, which detect movements and position of the body.

Protein

Large molecules composed of long chains of amino acids (see also amino acids). Essential for growth and repair, but also a source of energy with one gram of protein supplying four Calories when oxidised. Excess protein (amino acids) cannot be stored as such, therefore daily intake required.

Puberty

The beginning of the development of sexual maturity.

Pulse rate

The rate of the pressure waves generated in the arteries as a result of the contraction (systole) of the left ventricle. In normal, healthy individuals, pulse rate and heart rate are identical.

Q

Quadriceps

The quadriceps femoris is a group of muscles located in the front of the thigh. The Latin translation of 'quadriceps' is 'four headed,' as the group contains four separate muscles: the vastus lateralis, vastus medialis, vastus intermedius, and the rectus femoris.

R

Racist Behaviour

This is behaviour that develops from the idea of the superiority of one race (a division of humankind whose members

share certain characteristics) over another. This usually involves behaviour that is abusive, often violent, and discriminatory.

Rectus Abdominis

Muscle known as the "abdominals" or "abs", is a paired muscle running vertically on each side of the anterior wall of the human abdomen

Reaction Time

The time it takes for the brain to receive information, to decide what to do, and to send impulses to the muscles. Part of the response time.

Relaxation

A process of reducing tension, rigidity, anxiety, and intensity. Specific techniques can be developed, eg. Progressive Muscular Relaxation, the Quiet Place, Centring.

Reliability

A measure of whether a test gives repeatable results.

Residual volume (RV)

The volume of air left in the lungs after a forced maximal expiration.

Respiratory Exchange Ratio (RER)

The ratio of carbon dioxide produced and oxygen used. Indicates the type of fuel being used in the activity, e.g. aerobic oxidation of glucose (RER = 1), fats (RER = 0.7), and protein (RER = 0.8).

Respiratory Quotient (RQ)

See Respiratory Exchange Ratio.

Response Time

The time it takes to respond to some stimulus, eg. the actions of people.

Response = Reaction + Movement Time

Where the reaction time is the time it takes the brain to receive information, to decide what to do, and to send impulses to the muscles; and the movement time is the time it takes to actually move.

Reversibility (of training)

Gains in fitness as result of training are not permanent, they are easily lost (reversed) if training stops.

S

Sarcomere

The functional unit of a muscle myofibril, consisting of overlapping actin and myosin filaments between two Z discs (bands).

Slow-Twitch (ST) Muscle Fibres

Contract at a rate 2-3 times slower than fast-twitch (FT) fibres, but have greater endurance. Also known as red fibres as a result of the presence of myoglobin and large numbers of mitochondria.

Stationary Air

The air remaining in the lungs during quiet tidal breathing.

Strength

The force that a muscle can exert in one maximal effort.

Stroke volume (SV)

The volume of blood ejected by each contraction (systole) of the ventricle, is calculated by dividing the cardiac output by the heart rate.

Symbiosis

The living together of members of different species.

Sympathetic nervous system

The part of the autonomic (involuntary) nervous system responsible for preparing the body for action (see adrenaline.) Antagonistic to the parasympathetic nervous system.

Syncytium

Mass of cytoplasm in animals containing many nuclei as in striated muscle fibres.

Synthesis

Formation of complex substances from simpler ones. Requires energy.

Systemic circulation

The general circulatory system of the body, as opposed to that of the lungs (pulmonary circulation). Blood passes through the heart twice, as it flows from the systemic to the pulmonary and back to the systemic circulation.

Systole

Contraction, as in ventricular systole.

Superficial

On or near the surface, visible or palpable (able to feel with hands).

Suspension

Mixture containing solid particles that will ultimately settle out under gravity

T

Tachycardia

Resting heart rate faster than average.

Temporal summation

An increase in responsiveness of a nerve or muscle fibre, resulting from the additive effect of frequently occurring stimuli.

Tendon

Tough fibrous tissue attaching muscles to bones.

Testosterone

The male sex hormone secreted by the testes in the male, and by the adrenal cortex in both males and females. Responsible for the development of male characteristics.

Thorax

That part of the body containing the heart and the lungs, separated from the abdomen by the diaphragm.

Tidal volume

The volume of air moved during quiet breathing at rest.

Total lung capacity

Vital capacity + residual volume, difficult to measure.

Trace Decay (forgetting)

The fading away of a memory which has been learned but not practised or used.

Training (physical)

A process which is designed to improve physical capacity, fitness, skill, etc.

Transfer of Training (learning)

The influence of previously learned skills and activities on the learning of new ones. This appears to depend on the amount of similarity between the skills and activities and may be helpful (positive) or harmful (negative).

Trait Anxiety

A personality factor (trait). The tendency to become anxious in almost all or any situation.

U

Ulna

The longer bone of the forelimb between the humerus and the "wrist"

V

Validity

A measure of whether a test actually tests what it claims to test, e.g. does the Conconi test give an accurate measure of the anaerobic threshold? (Answer = No)

Vasoconstriction

A decrease in the diameter of a blood vessel (usually an arteriole) by contraction of circular involuntary muscle fibres in the walls, resulting in a reduction of blood flow to the area supplied by the vessel.

Vasodilation

An increase in the diameter of a blood vessel (usually an arteriole) resulting in an increased blood flow to the area supplied by a vessel.

Vasomotor

Relating to the control of vasoconstriction and vasodilation.

Viscosity

“Thickness” of a fluid or “ease of flow”, e.g. plasma has a viscosity which allows it to be pumped rapidly around the body.

Vital Capacity

The total volume of air that can be expired following full inspiration, in other words the total volume of air that can be moved over the lungs in one “breath”.

Vitamins

Complex organic substances required in the diet (NB vitamin D also produced by the action of ultra-violet light on the skin), essential for normal body functions and maintenance of health. Vitamins contribute to the regulation of metabolic processes, including a role in energy transformations.

Viviparous

Young born alive after developing on nutrients obtained from the mother rather than from egg yolk. Not separated from the maternal tissues by the egg membrane.

Voluntary Muscle

Muscle that can be controlled by the conscious decisions

W

Warm-up

A warm-up should involve a gradual increase in the heart rate and breathing rate, a slight rise in body temperature, and prepare the mind and the body for activity. Helps to reduce the risk of injury

Water potential

A special case of “chemical potential”. All substances diffuse from regions of high concentration or high chemical potential to regions of low concentration or low chemical potential. With respect to water, pure water has the highest chemical or water potential, and the presence of solutes lowers the water potential of a solution. Thus in osmosis water diffuses from regions of high water potential to regions of low water potential. Water potential is measured in kPa.

Wild type

Phenotype (appearance) characteristic of the majority of a species in a natural environment.

Work

Application of a force through a distance; it is measured in joules (J, kJ, MJ).

Work rate

Work performed per unit time = power.

X

Xerophytes

Plants adapted to dry habitats.

Y

Z

Zoospores

Flagellate, motile spores found in some fungi and algae.

Zygospor

Thick-walled resistant resting spore produced by sexual reproduction in some fungi; for example *Mucor*, and in some algae; for example *Spirogyra*.

Zygote

Cell (typically diploid) formed by the fusion of two gametes (each typically haploid), eg fertilised egg in humans.