

glossary

acupuncture A therapeutic technique involving the insertion of needles. Used by some physiotherapists and doctors (and acupuncturists). Practitioners claim beneficial effects for such problems as: pain management; impaired circulation; hypertonicity; trigger points; low energy.

acute injury The immediate and early stage of an injury, typically described as being the initial 24–72 hours following trauma, and marked by the presence of an inflammatory response.

adenosine triphosphate ATP is a chemical compound containing adenine, ribose and three phosphate groups. ATP provides the energy for muscular contractions. The muscle myofilaments (actin and myosin) use this energy to cause their process of cross-bridging during the contraction of muscle fibres. This compound is involved in all three pathways of energy supply: the two anaerobic pathways (creatine phosphate and lactate systems) and the aerobic system.

adhesions Fibrous infiltration of soft-tissue as a result of trauma or pathology. Involves a binding together of normally separate tissues, resulting in restricted mobility.

aerobic training Relatively long-duration, low-intensity exercise. Fuelled by the aerobic pathway of energy.

agility training A key component of fitness. Developing balance, co-ordination, speed, reaction and generally fluid movement.

agonist Prime mover or protagonist. A muscle whose action is the main mover of a joint.

anabolism The metabolic process of building up simple substances into more complex compounds.

anaerobic training Exercise activity performed without utilizing the oxygen (aerobic) energy pathway. Fundamentally, relatively short-term strength, speed and power-based activities.

antagonist Muscle whose action opposes that of its agonist. Major muscles tend to work in antagonistic pairs across joints (e.g. biceps and triceps).

ante- Prefix meaning before or forward (e.g. antenatal; anterior; anteversion).

anti- Prefix meaning against (e.g. anti-inflammatory; antibiotic; antigen).

arthroscopy 'Key-hole' examination of a joint through a tiny camera, with visuals on a screen. The procedure may incorporate a trimming and cleansing operation of the joint.

articulation (a) Where two or more bones meet to form a joint (e.g. the knee joint; the scapulo-thoracic articulation). (b) The movement of a joint, whether active or passive.

atrophy Wasting of muscle due to disuse, disease, injury or malnutrition.

audiosonic (AS) A hand-held percussor massage machine. Produces a gentle agitation of tissues at a depth under the skin.

balance (physical) The ability to maintain the body's centre of gravity over its base of support.

balance training Exercise techniques designed to encourage physical balance, such as standing on one leg, on a wobble board, or maintaining positions using a fitness ball.

ballistic stretching 'Bouncing' type mobility exercise. Not usually recommended for developing flexibility, but possibly useful as part of the warm-up for certain sports.

basal metabolic rate (BMR) The lowest rate of metabolism (energy use) that can sustain life. Measured after overnight sleep and fast.

beats per minute (bpm) A common and simple method for evaluating the intensity of training, and for basic fitness assessment.

blood pressure (BP) The pressure exerted on the walls of the main arteries as the heart is contracting (systolic) and relaxing (diastolic).

body fat percentage The estimated proportion of body fat in the body. Typically assessed by use of skin fold measurements or bioelectrical impedance, and the associated mathematical formulae.

body mass index (BMI) Body mass index is a rather limited, but commonly used estimate of an individual's fatness. A simple formula takes the individual's weight (in kg) and divides this by their height (in m) squared. $BMI = \text{weight (kg)} / \text{height (m)}^2$, and the resulting figure is compared against a small scale of generalized norms.

bone Hard, dense, connective tissue. Two basic types: compact and cancellous. Five classifications of bone: short; long; irregular; flat; sesamoid.

bone marrow Contained within the inner cavity of many bones. Red bone marrow produces new blood cells. Yellow bone marrow stores fat cells.

bursa A fluid-filled, sac located around joints, and whose purpose is to help reduce the friction between moving tissues.

bursitis Inflammation of a bursa, due to mechanical irritation (e.g. constant rubbing of tendons; excessive compression), or infection.

calorie A unit of energy measurement used to measure heat-producing, or energy producing value in food.

cardio-vascular (CV) The combined functional aspects of the circulatory (in particular the heart) and respiratory (in particular the lungs) systems.

cartilage Resilient connective tissue. Provides additional protection and support for the skeletal system. Three types: articular; fibro; elastic.

catabolism The metabolic breakdown of complex compounds into simpler substances.

cavity An anatomical space. Commonly described cavities are the: cranial; spinal; thoracic; abdominal; pelvic. Cavities are defined by the skeletal and soft tissue structures that surround them, and also contain areolar and adipose connective tissue. Four particular anatomical spaces, commonly described due to their vulnerability and the important structures that they house, are: the femoral triangle (below the groin); the popliteal space (behind the knee); the cubital space (in the elbow crease); the axillary space (the armpit).

cell The basic unit of life.

chiropody/podiatry Allied medical professions, involving treatment of the feet by a chiropodist or podiatrist, for such a variety of foot-related problems as corns, calluses, pes planus, hallux

valgus, structural malalignments and impaired gait.

chiropractic One of the mainstream complementary therapies. Principally involves the application of joint manipulative techniques aimed at improving structural alignment.

chronic injury A long-standing injury problem.

closed-chain exercise Exercise in a weight-bearing position that produces predictable movement through the associated kinematic chain.

code of ethics An official set of rules as agreed and instigated by a professional organization. Guided by legal regulations, and designed to promote high standards of practice, it will state clearly the obligations of its members.

cold pack An easy method of applying cryotherapy to an injured region. Typically made from frozen gel or silicone.

collagen A connective tissue, and there are several types. Gives strength and resilience to structures, and is predominant in ligaments, tendons, cartilage and scar tissue.

complementary Therapy or 'medicine' that may either be recommended in conjunction with conventional allopathic medicine, or sought privately by the individual. The mainstream complementary therapies (e.g. osteopathy; chiropractic; acupuncture; sports therapy; aromatherapy; reflexology) have in recent years gained much greater respect and utilization.

concentric contraction An isotonic muscle contraction, with shortening of the primary muscle(s).

condyle A rounded protuberance that occurs on some bones, either for muscle attachment or stability (e.g. medial and lateral femoral condyles).

connective tissue The most abundant basic tissue. Binds together, supports, strengthens and protects. The main classes of connective tissue are: areolar; adipose; white fibrous; elastic fibres; reticular fibres; cartilage; blood; bone.

continuous training A key component of aerobic fitness training that involves the athlete sustaining a 'steady state' of submaximal long duration exertion.

cool-down A key component of fitness training. Designed to help return the body to its preexercising state and to reduce the potential for poor recovery or delayed onset muscle soreness.

co-ordination training A key component of fitness development. Involves skills practice (repetition).

creatine phosphate (CP) A substance found in skeletal muscle used for very short-term maximal energy.

cryotherapy The use of cold or ice for therapeutic purposes, typically to help calm inflammation, swelling and pain.

cyto- Prefix relating to the study of cells (e.g. cytology; cytoplasm; cytotoxic).

dehydration Loss of body fluids.

delayed onset muscle soreness (DOMS) Characteristic muscle aching, tenderness, oedema

and weakness following excessive or inappropriate exercise activity.

derm- Prefix relating to the skin (e.g. dermis; epidermis; dermatome).

dermatome An area of skin supplied by one sensory spinal nerve. Typically, a strip of skin, about an inch or two (2–5 cm) wide, either running around the torso or down the limbs. Each relates to a particular spinal segment.

developmental stretching Relatively long duration, relaxed and progressive stretching. Helps to improve flexibility.

diagnosis Educated assessment of the nature of an injury or illness, made by a medical expert.

diaphragmatic breathing A relaxation and breathing training exercise. Conscious full breathing, involving controlled activation of the diaphragm during inspiration.

diffusion Process whereby small molecules pass through the semi-permeable cell membrane, from an area of high concentration to an area of lower concentration. Diffusable substances include water, oxygen, carbon dioxide, glucose, amino acids, fatty acids, glycerol, vitamins and minerals.

direct injury An extrinsic injury, typically involving an impact trauma.

diuretic A substance that promotes water excretion.

duration A key aspect of sports therapy. Duration means 'period of time'. In any particular treatment or exercise, the duration may be a few seconds, minutes, or more.

dynamometer A strength testing machine. Most common are for hand grip strength or back strength. The grip strength dynamometer usually incorporates an adjustable grip handle and a dial, which shows the amount of force produced during a single (isometric) exertion.

dys- Prefix meaning abnormal, problematic (e.g. dysfunctional; dyspepsia; dyslexia).

ease-bind A palpatory soft-tissue assessment technique, used to ascertain the relative amount of easy movement and eventual restriction in connective tissues and muscles.

eccentric contraction An isotonic muscle contraction, with lengthening of the involved muscle.

electrical muscle stimulation (EMS) Muscles may be electrically stimulated, by way of a lowfrequency interrupted direct current, to encourage increased tone, and to gently massage an area. Can be useful in early and intermediate stage rehabilitation.

electro-massage Massage techniques applied by a machine. There are a variety of units, each offering different effects and applications.

end-feel The quality of feel at the end-range of a joint's movement, as assessed and palpated by the therapist.

endo- Prefix meaning within, inner, containing (e.g. endomycium; endocrine; endogenous).

endocrine gland Hormone-secreting ductless gland. Hormones are chemical messengers and are released directly into the bloodstream. The endocrine system works with the autonomic nervous system to regulate most bodily functions.

endorphin A variety of opioid peptide hormones secreted in the CNS. Their most well-known action is in the mediation of pain.

enzyme A biological catalyst. Enzymes are protein compounds that speed up the rate of physiological reactions, but do not themselves alter in the process. The main two factors involved in enzyme activity are the body's working temperature and the pH (measure of acidity) of the involved solution.

epi- Prefix meaning upon, following (e.g. epimysium; epicondyle; epithelium).

epicondyle A protuberance above a condyle on a bone (e.g. medial and lateral humeral epicondyles).

epithelium Tissue that covers the inner surfaces of the body. Several types, with various functions. It lines vessels and organs, forms membranes, and glands are made up of epithelial tissue.

ergogenic Able to improve work or performance.

erythema A reddening of the skin, due to increased superficial circulation and vasodilation.

essential When used to describe a nutrient: necessary for growth and well-being, but cannot be produced in the body so must be provided by food.

extra- Prefix meaning outside, beyond or in addition to (e.g. extracellular; extracapsular; extraction).

extrinsic injury An injury related to external factors, such as the nature of the training, equipment, environment or competition.

facilitated region An abnormal situation, where neurologically related soft-tissues become hypersensitive or hyperirritable due to constant dysfunctioning.

fartlek training Fartlek training, or 'speed-play' training, involves varying the speed of the exercise at various periods in the activity.

fascia Fibrous connective tissue. Covers, supports and separates muscles.

fibrosis Process of scar tissue formation.

first aid The initial help and assistance offered to an injured or affected person.

fitness test (health-related) A series of basic tests and controlled exercises, designed to gain assessment of the subject's physical and functional capabilities.

fixator Stabilizing muscles, whose main action is to provide support to assist in holding the body in position during posture and while movement takes place. Core stabilizing muscles can be trained to support the back and torso during movements of the body. Stabilizing muscles are predominantly slow twitch (Type 1) muscle fibres, and are deep and close to joints.

flat back A postural malalignment demonstrating a reduced lumbar curvature, often associated with posterior pelvic tilt.

flexibility The relative suppleness or ability to stretch all major muscle groups towards a near normal range. May be measured by use of a tape measure or goniometer.

foramen A hole in a bone or group of bones (e.g. ischial and vertebral foramen).

fracture A break in a bone. Various types, e.g. compound; comminuted; greenstick; avulsion; stress.

frequency A key aspect to sports therapy. Frequency is typically taken to mean 'how often' (e.g. three sets of ten repetitions of one particular exercise in one workout, and three exercise sessions or treatments per week). In treatment situations, electrical frequencies need to be carefully selected and adjusted when using electrical muscle stimulation, transcutaneous electronic nerve stimulation or ultrasound.

gait The quality and style of walking (or running). Two basic components: stance phase and swing phase.

glycaemic index (GI) A measurement of the degree to which carbohydrates in different foods raise blood sugar levels, compared with pure glucose.

glycogen The form of carbohydrate stored in the body, mostly in the muscles and liver.

glycogenesis The conversion of protein or fat to glucose.

glycogenolysis The conversion of glycogen to glucose.

goniometry The measurement of specific angles and ranges of movement, using a goniometer (a type of protractor).

gym induction The process of guiding a new gym member through all the essential safety issues, and instructing the use of equipment (stations, machinery and free weights).

G5 machine A free-standing massage machine, with a selection of applicator heads for different effects.

haemo- Prefix relating to blood (e.g. haemoglobin; haemophilia; haemostasis).

holistic An approach to health improvement which considers the 'whole' of the person: their mental (mind), physical (body) and spiritual (spirit) well-being.

homeostasis State of internal physiological balance or equilibrium, despite variations in the external environment.

hormone Chemical messenger produced by endocrine glands. Typically released directly into the bloodstream.

hot pack Any type of small heated pack that might be heated in boiling water, in the microwave, or electrically. May be applied onto the body, postacutely, to provide superficial warmth, increased circulation, relaxation, pain relief or preparation (pre-heat) for further treatment.

hydrotherapy The use of water to provide therapeutic benefit. May involve: jacuzzi/whirlpool; steam bath; water jet massage; exercise in water.

hyper- Prefix meaning above normal or excessive (e.g. hypertonic; hypertension; hyperextension).

hyperaemia Increase in blood circulation through a region.

hypertrophy Increase in size of muscle fibres due to specific resistance training.

hypo- Prefix meaning below normal or deficient (e.g. hypoglycaemia; hypothermia; hypoxia).

impact injury An injury resulting from an impacting force, for example having a heavy fall, head clash with an opponent, or being struck by a ball.

indirect injury An intrinsic injury, typically resulting from excessive forces generated within.

inflammation The body's typical acute response to a musculo-skeletal injury. The five classic signs and symptoms are: pain; swelling; redness, warmth; and impaired function.

infra-red lamp A useful form of thermal therapy. Provides increased circulation, relaxation and possibly pain relief. Many safety issues apply.

insertion Point(s) on a bone that a muscle runs to. On concentric contractions the insertion moves towards the origin.

insulin A hormone produced by the pancreas that assists glucose entry into cells.

intensity A key aspect of sports therapy. Intensity means 'how hard'. In training, the intensity should always be appropriate to the individual's ability. In treatment, the intensity might relate to the strength of electrical stimulation, or to the amount of pressure applied through a massage technique, for example. Intensity should always be increased with caution.

inter- Prefix meaning between (e.g. intermuscular; interstitial; interosseous).

interval training A form of aerobic training that combines periods of strenuous work with periods of recovery.

intra- Prefix meaning within (e.g. intramuscular; intracellular; intra-articular).

intrinsic injury An injury resulting from, individual, anatomical or pathological factors.

isokinetic training Muscle training that maintains tension on a muscle across its available range of movement at a controlled speed with an accommodating resistance.

isometric training Isometric means same length. Muscle contractions without shortening or lengthening, a static contraction. Particularly useful in early stage rehabilitation strengthening.

isotonic training Isotonic means same tension. Muscle contraction with shortening and lengthening. Most gym machine and free weight strength exercises involve isotonic contractions.

joint An articulation. The contact point between two or more bones and/or cartilage. Joints are either synovial (freely movable), cartilaginous (slightly movable) or fibrous (immovable).

karvonen formula The 'heart rate reserve (HRR) formula' incorporates the resting heart rate into the training heart rate (THR) ($220 - \text{age} = \text{HR}_{\text{max}}$) equation. The Karvonen formula: $\text{HR}_{\text{max}} - \text{RHR} = \text{HRR}$ (bpm). $\text{HRR} \cdot (\text{percentage exercise intensity}) = A$. $A + \text{RHR} = \text{THR}$ (bpm). (RHR = resting heart rate.)

kinematic The dynamics of movements. The 'kinematic chain' is the complete series of muscles, bones and joints involved in any particular movement.

kinesthesia Usually taken to mean conscious awareness of body position and movement rates.

kyphosis Postural malalignment demonstrating exaggerated or pronounced thoracic curvature.

legislations Official and legally binding laws, rules and regulations.

ligament Tough, relatively inelastic band of connective tissue. Ligaments are predominantly composed of collagen fibres, and attach, link and hold bone to bone at joints. They also form part of the synovial capsule. Like tendons, they have a relatively poor blood supply.

ligament stress test (LST) A basic structural integrity test of a suspected ligamentous injury. Involves the therapist passively stressing the affected ligament along its length. Excess laxity or pain can be indicative of injury.

lordosis Postural malalignment demonstrating exaggerated or pronounced cervical or lumbar curvature.

manual muscle tests (MMT) Tests aimed at assessing the contractile ability of muscles. MMTs help to differentiate between a muscle injury, neurological impairment and damage to related tissues.

manual therapy Any treatment predominantly performed by the therapist without much in the way of equipment, such as massage or mobilization.

martial arts Oriental disciplines of fitness, self-defence and personal development.

massage Manipulation of the soft-tissues of the body for a selection of effects and benefits.

massage medium Lubricant used to help perform certain massage techniques, including: oils; creams; lotions; balms; talcs.

membrane A thin layer of tissue. Surrounds a cell, tissue or organ, or lines a cavity. A mucous membrane, such as in the respiratory or digestive tract, secretes mucus for protection and lubrication. Serous membranes line the larger cavities of the body, such as the abdomen (peritoneum) or chest (pleura). These comprise two layers, lubricated by a thin plasma-like (serous) fluid, which encourages a freer movement of the organs within.

metabolism The chemical and physical changes that take place within the body to facilitate continued growth and functioning.

mobility The measurable amount of movement available at a joint, or range of joints. Mobility may also be seen as the individual's functional ability to move, either specific joints or generally.

multi-stage bleep test A classic test which allows for evaluation of an individual's aerobic capacity. Involves timed runs between two points, and as the test progresses, the time increases. The subject attempts to run and keep up with the sound of prerecorded 'bleeps'.

muscle Contractile tissue, for motion, posture, heat production and movement of substances within the body. Three types: striated (skeletal or voluntary); smooth (involuntary); cardiac (heart).

muscle tone/tonus Normal state of partial contraction in a resting muscle.

muscular endurance A key aspect of fitness development. The ability to perform and maintain relatively strenuous muscular activity.

myo- Prefix relating to muscular system (e.g. myofibril; myoglobin; myositis).

myotome A group of muscles innervated by a single nerve root.

nerve A bundle of fibres responsible for transmitting impulses of sensation to the CNS, or motor impulses from the CNS to muscles and organs.

neuro- Prefix relating to nervous system (e.g. neurology; neuromuscular; neurotransmitter).

neurotransmitter Chemical released at nerve endings to transmit impulses across synapses to other nerves or to the muscles, organs or glands that they supply.

observation Visual inspection or analysis.

oedema Swelling as a result of abnormal accumulation of fluids within tissues. Can be local or general, acute or chronic. May be lymph or synovial based. Can result from problematic lymphatic drainage, trauma to tissues or secondary to underlying pathology such as coronary heart disease. Chronic oedema may be accompanied by thin, fragile or thickened sclerosed skin.

open-chain exercise Exercise where the working limb (or kinematic chain) is not in a weight-bearing position (e.g. seated leg extension). It is often employed during intermediate stages of rehabilitation.

organ Body part of two or more tissues forming a specific function. The organs of the body are known as viscera.

origin Point(s) of attachment for a muscle, via its tendon(s), to its bone(s).

orthopaedics The area of medicine involved in the detail assessment, surgical intervention, and recommendation for treatment and management of musculo-skeletal problems.

orthotics The science involved in the making and fitting of orthopaedic supports, braces and shoe inserts and modifications.

osteopathy One of the mainstream complementary therapies. Involves detailed physical assessment, followed by such techniques as massage, muscle energy, positional release and joint manipulation.

overload A key training principle. In order to gain improvements (adaptations) in fitness, training levels should be (progressively) overloaded (at appropriate intervals).

overtraining A condition typified by such symptoms as excessive fatigue, higher incidence of injuries, poor sleep, persistently elevated heart rate, amenorrhoea, weakened immune system, etc.

overuse injury An injury resulting from excessive, repetitive or inappropriate training.

palpation Physical assessment of tissue through educated touch and feel.

para- Prefix meaning near, beside, resembling or abnormal (e.g. parathyroid; parasympathetic; paraesthesia).

paraffin wax (PW) Thermal (heat) therapy using molten paraffin wax, applied to the affected region either by brush or by repeated immersion into a specialized wax bath.

pathology The study of disease processes.

peak expiratory flow rate (PEFR) A simple test of lung function. The subject blows forcefully into a tube, and their score is recorded. Provides basic information regarding the peak rate of air coming out of the lungs in one blow.

perceived exertion (scale of) The Borg scale of perceived exertion allows the exerciser to report, subjectively, on how hard they feel they are exercising. A scale of 6 (no exertion) to 20 (maximal exertion) is typically used.

percussor machine Electrical massager, which produces rapid tapotement-like movements. Helps to increase circulation and relax muscle tension.

peri- Prefix meaning around (e.g. pericardium; perimycium; periosteum).

periodization A key training principle, involving the tailoring of fitness programmes towards achieving total preparation for optimal performance in competitions. Periodization typically employs three phases of preparation: a conditioning phase; a transitional phase; and a competition phase.

periosteum A vascular, fibrous membrane – the outer protective covering for bone. Gives attachment for muscles and ligaments and contains many osteogenic and osteoblast cells (the bone-forming cells that deposit new bone tissue). Also contains nerves, lymph vessels and capillaries which serve the marrow and cancellous bone.

periostitis Inflammation of the periosteum, typically resulting from excessive physical stress from exercise (e.g. 'shin splints').

permeability The ability of membranes to allow soluble substances to pass through them.

phasic muscles More responsible for explosive movements through gravity. Tend to be uniaxial (crossing just one joint), but not always. Have greater proportion of fast twitch (Type II) fibres and, therefore, contract quickly but are more prone to fatigue. They are also more prone to such activity injuries as musculo-tendinous junction problems and tendonitis.

physical activity readiness questionnaire (PARQ) Used for basic pre-exercise screening of clients.

physical assessment A selection of manual tests designed to form a basic assessment of the client's physical state, which then guides the sports therapist towards being able to provide the correct treatment and advice. Involves observation and palpation, and can include assessment of: height; weight; body circumferences; posture; range of motion; gait; and muscle, joint, nerve and circulatory integrity.

physical fitness Defined variously as being: the ability to comfortably perform particular physical tasks; the ability to carry out daily tasks without undue fatigue; the ability to function well under exercise conditions; the capability of the cardio-respiratory and muscular systems to function at optimum efficiency.

physiotherapy A major allied medical profession involving assessment, treatment and prescriptive exercises for a wide variety of health problems. Main methods include rehabilitation exercise, manual therapy and electro-therapy. There are many specialist areas within the field of physiotherapy.

pick-up speed training An approach used by athletes to develop both aerobic and anaerobic fitness, and, in particular, speed. Beginning with a period of walking, followed by a period of jogging, the athlete then picks-up their pace to run fast and builds up to a period of sprinting.

planes Three main ways in which sections of the body can be viewed or body movements described. The frontal plane, with a straight vertical line, divides the body into anterior and posterior portions. The sagittal plane divides the body into left and right sides. If the particular plane in question is central, on a midline between each section, it is known as either the midsagittal or midfrontal plane. The transverse plane, with a horizontal line, divides the body into superior and inferior portions. The planes of the body enable specific description of a view of the body. Cross-section anatomical diagrams, photographs and scans are described in terms of planes. Frontal plane movements include lateral flexion and extension and abduction and adduction. Sagittal movements include flexion and extension. Transverse movements are rotational.

plateau A key training principle. If fitness training is not gradually and progressively overloaded, it will reach a plateau (levelling off).

plumb-line assessment Method of assessing postural alignment. Client stands beside a full-height, weighted string.

poly- Prefix meaning many or excessive (e.g. polyarthritis; polymyalgia; polyuria).

post- Prefix meaning after, behind or beyond (e.g. post-natal; post-isometric; post-operative).

postural muscles More responsible for posture and support of the body in gravity. Tend to be biarticular (crossing two joints) and have greater proportion of slow twitch (Type I) fibres. They are slower to contract but less prone to fatigue. Tend to shorten and increase their tension when under strain and are more prone to cramp and trigger point development.

posture The physical attitude of the structural body during standing, sitting and movement. Good body alignment and posture should be encouraged and developed.

power A key training component, associated with performing short bursts of very strenuous activity. Combines strength and speed. Power-based exercises usually involve plyometric activities.

preparatory stretching Basic short duration major muscle group stretches, prior to fitness training or competition. Forms part of the warm-up.

prognosis Probable long-term outcome, regarding an injury or other medical condition.

progression A key training principle. Training must be progressively (gradually, but sufficiently) overloaded so as to achieve adaptations safely and effectively.

proprioception The body's ability to maintain awareness of its positioning, through its specialized sensory receptors (proprioceptors), enabling rapid neuromuscular responses to the ever-changing environment.

pulse The alternating wave of expansion and recoil within an artery that relates to the contraction (systole) of the left ventricle of the heart.

pulse recovery rate (PRR) A simple test of cardiovascular fitness. Typically, the one minute PRR is taken from the exercising heart rate to ascertain the individual's efficiency of recovery from exertion.

range of movement (RoM) The degree of movement at a particular joint or region. There are recognized norms which should be compared against when assessing an individual's RoM.

recovery A key training principle. All well-considered training programmes should incorporate sufficient recovery periods, days and techniques.

referral The professional process of recommending additional, alternative or specialist attention, assessment, treatment or exercise. Involves documented discussion, explanation and agreement with all those concerned.

reflex tests Simple neurological tests that involve gently striking certain tendons on the body with a reflex hammer in order to assess their response, and therefore their nerve supply. Most commonly tested reflexes are: patella tendon; biceps; triceps; and Achilles.

rehabilitation The recovery programme that is carefully prepared and planned for, by a physiotherapist, sports therapist or other professional, for an injured client. Each stage (early stage to the full functional stages) requires a carefully planned approach.

relaxation The act of effectively resting, or being able to relax. Relaxation exercises, such as diaphragmatic breathing or progressive relaxation, are recommended so as to allow the body its necessary recovery time from exertions, to offset stresses and fatigue, and to replenish energy levels.

remedial exercise Specially selected exercises designed to help achieve agreed achievable objectives, such as increasing specific flexibility, reducing body fat or improving aerobic endurance.

remedial massage Advanced application of massage and mobilization techniques to achieve specific objectives such as: freer, fuller RoM; muscle relaxation; pain reduction; formation of optimal scar tissue.

repetition A key training principle. By repeating particular exercises, athletes improve skills and functional endurance.

repetition maximum (RM) The most amount of weight that can be lifted in one lift (1 RM), or for ten lifts (10 RM).

research Systematic, scientific and ethically sound investigation into a particular area of practice. Research is often designed to support or negate a particular hypothesis, and therefore further the knowledge (and evidence) base of a subject.

resisted movement Specific movement made against the measured resistance of the therapist or exercise equipment such as free weight. It may be isometric or isotonic.

resting heart rate (RHR) Typically between 50 and 80 beats per minute. A lower HR tends to suggest that the individual is aerobically trained, and that their heart is working less hard at rest.

retinaculum Fibrous connective tissue holding tissues into position.

reversibility A key training principle. As the amount of training reduces or is stopped, fitness levels reduce.

RICES Rest, Ice, Compression, Elevation, Support.

sauna A dry heat treatment. Clients sit in a timber construction, and the air is heated to between 70 and 110 °C. Encourages relaxation, perspiration (skin cleansing and elimination of waste products) and increased blood circulation.

scar tissue New tissue laid down as a repair following trauma. The restoration of an injured tissue depends upon the severity of the trauma and upon which type of cell – stromal or parenchymal – is active in the repair. Stromal repair is performed with the cells from the supporting connective tissue and is predominantly collagen and non-functional. Parenchymal repair is with the injured tissue's functional cells.

scoliosis A postural malalignment, demonstrating an 'S-shaped' curvature of the spine, often featuring pelvic girdle or leg length imbalance, and associated malalignments.

sign An objective finding relating to an assessment of an individual (e.g. pallor; swelling; bleeding; malalignment).

'sit and reach' test A simple test of back and leg flexibility. The subject sits with feet against a sit and reach box. They lean forward as far as is possible, and their best score from three attempts (measured on the scale on top of the box) is recorded.

skill A trained, well-performed action.

skills training The act of developing good ability to perform particular tasks and actions. Sports-specific training involves varied repetitions of actions relevant to the sport.

somatype Basic body type categorization. Three basic somatypes: ectomorph; mesomorph; endomorph.

specialized tissues These include all special and vital organs (e.g. eyes; nose; heart; lungs; genitalia).

specificity A key principle of training, which suggests that all exercise benefits are specific to the type of training performed. Exercise should also be specific to the level that the individual is currently at.

speed A need of most competitive sports, speed is developed by strength and power training, by having sufficient functional flexibility and biomechanical leverage, and by optimizing technique (making it more biomechanically efficient).

sphygmomanometer Equipment used to measure blood pressure. Features a mercury scale, two rubber tubes, a small air pump and a cuff.

sports massage The application of specific massage techniques, designed to help improve sports performance or recovery from training and competition. Sports massage can be adapted to be used in pre-event, during-event or postevent situations, and for general maintenance.

sprain An injury to a ligament. Three grades of sprain: first degree (mild); second degree (moderate); and third degree (severe).

stability training A key component of fitness and functional ability. Stability training helps to keep the body strong enough to withstand the rigours of training and competition. Stability exercise involves targeting the body's (core and peripheral) stabilizing muscles.

static stretching Basic stretching that involves simply stretching and then holding the position, whether actively or passively performed.

steam bath A wet heat treatment that involves the recipient's body being seated in an enclosed fibreglass bath, with their head situated outside of the unit (which many find more preferable,

being able to breathe comfortably). Water is heated inside the cabinet by an electrical element, and the resultant steam circulates around the unit at a temperature of around 45–50 °C. A thorough heat treatment that encourages relaxation and increased circulation.

steam room A wet heat treatment, similar to a steam bath, but where the client's head is also exposed to the steam.

strain An injury to a muscle or tendon. Three grades of strain: first degree (mild); second degree (moderate); and third degree (severe).

strength The capacity of a muscle or group to exert force.

symptom Subjective information revealed by the individual regarding their condition (e.g. pain; nausea; numbness; cold).

synergists Muscles that work with the prime mover to perform specific movements. Also called neutralizers because they may help to neutralize unwanted motion from the prime mover, in order to refine a particular movement.

synovitis Inflammation of the synovium of a synovial joint. May be due to impact or repetitive trauma, or infection.

system Group of organs functioning together for the same general purpose.

taping The use of adhesive rolls of tape, whether elasticated, non-elasticated, permeable to air, water resistant, hypoallergenic or tearable, for the purpose of supporting injured, weak or vulnerable joints or muscles.

target heart rate (THR) An individual's (aerobic) THR is calculated by firstly working out their maximal HR (220 – age), and then working out an appropriate percentage of this figure, according to their fitness level. Beginners typically exercise at between 50 and 70 per cent of their max, and more advanced may work at between 70 and 90 per cent.

tendinosis Chronic degeneration of tendon fibres.

tendon Strong cord of connective tissue that attaches muscle to bone. Like ligaments, they have a poor blood supply and are relatively inelastic (only around 10 per cent movement). They effectively transmit muscular force to the bones, and therefore very little muscle force is lost stretching the tendon.

tendonitis Inflammation of a tendon.

thermal therapy The application of heat as a method of increasing relaxation or improving the healing rate of injuries. Common methods include: infra-red lamp; paraffin wax bath; sauna; steam bath; steam room; and moist hot packs.

tissue Group of similar cells that perform a specific function.

tissue fluid Extracellular or interstitial fluid. Similar in composition to blood and lymph. Surrounds and nourishes living cells.

transcutaneous electronic nerve stimulation (TENS) An electrical method for helping to relieve pain. A low-intensity, high-frequency current is applied through pads placed strategically on the skin. TENS can be used by clients unsupervised, once guided.

transfer A key training principle that suggests that the benefits gained from one particular exercise regime may cross-over to another.

trigger point (TP) A very localized area of hypersensitivity, typically housed within postural muscle. When 'active' they characteristically refer aching in a particular pattern away from the point.

triglycerides The body's most concentrated energy source and the form in which most fats are stored in the body.

trochanter A large protuberance. Provides for prominent muscle attachment and additional structural stability (e.g. greater and lesser trochanters of the femur).

tuberosity A large protuberance on a bone. Mainly for prominent muscle attachment (e.g. tibial, ischial, gluteal and radial tuberosities).

Type I fibres Slow-twitch (ST) or slow-oxidative (SO) muscle fibres. Associated with endurance activities (aerobic exercise and postural control).

Type II fibres Fast-twitch (FT) muscle fibres. Two types: fast-oxidative-glycolytic (FOG) Type IIA; fastglycolytic (FG) Type IIB. These two types of fibres are associated with short-term, forceful, anaerobic activities, but are prone to fatigue.

ultrasound (US) Electrical therapy equipment, commonly used in the treatment of strains, sprains and tendonitis. Employs inaudible, high-frequency sound waves that occur as an alternating electrical current is imposed onto a piezo-electric crystal within a transducer (applicator) head. By varying the frequency, intensity, transducer head and duration, the effects can be altered to suit the nature of the presenting condition.

variance A key training principle that involves varying aspects of training so that any potentially deleterious effects resulting from any regular rigorous and vigorous training routines are minimized.

vaso- Prefix relating to blood vessels (e.g. vasodilation; vasoconstriction; vasomotor).

vasoconstriction A decrease in the diameter of blood vessels, reducing blood flow through a region.

vasodilation An increase in the diameter of blood vessels and, therefore, blood flow.

$\dot{V}_{O_2\max}$ Maximal oxygen uptake. The maximal amount of oxygen that can be taken in and utilized by the working muscles during exercise. There are a variety of tests available, most of which attempt to predict/estimate the individual's $\dot{V}_{O_2\max}$ or aerobic capacity.

waist to hip ratio (WHR) The WHR helps to identify patterns of fat distribution in the upper and lower body.

warm-up A key component for all fitness activities. May involve gradually raising heart rate, performing mobilizing and stretching exercises, and movements that replicate those of the activities that are to follow.

yoga Means 'union'. An ancient Indian discipline offering a variety of styles and approaches to health improvement. Most common in the West is Hatha yoga, which has an emphasis on generating strength and suppleness in combination with calmness and body awareness.