



PDHPE - Core 2 Notes

PDHPE CORE 2 Notes – Factors Affecting Performance

How does training Affect Performance?

Energy Systems

The ability to do work. Primary energy source is ATP.

3 energy pathways – Aerobic, Lactic Acid and ATP/PC

1. Alactic/ATP/PC/Phosphate system (1st Anaerobic system)

Supplies of ATP limited, only enough supply for one muscular contraction. The explosive muscular contraction causes ATP (adenosine triphosphate) to split to ADP (adenosine diphosphate)

Source of fuel: CP (Creatin Phosphate) stored in cells

Duration: 10-12 seconds

Intensity of effort: Explosive activity, high intensity (85-100% max effort)

Rate of recovery: 2 minutes to fully replenish
continually supply creatin phosphate

Cause of Fatigue: Results from inability to

By-products: Heat and energy
instantly)

Efficiency: Rapid but limited (not very efficient but acts

2. Lactic Acid System (2nd Anaerobic system)

Following 10-12 seconds of ATP/PC system, body begins to use lactic acid system. Produces energy without oxygen.

Source of fuel: Carbohydrates – Glucose (in blood) and Glycogen (in storage form)

Duration: 30 sec at 85% max effort. Can last 3-4 minutes at 70-80% and up to 30mins at 60% or less. This system is used from approx. 30sec into exercise to 3 min.

Cause of fatigue: The build up of lactic acid in muscles

Rate of recovery: Takes approx. 30 mins to 1 hour to break down the lactic acid

Efficiency: Rapid but limited. Has adverse product.

Intensity of effort: Up to 85% max. effort.

By-products: Lactic acid and heat.

3. Aerobic System

Activity lasting longer than a few minutes requires oxygen to maintain muscular contractions.

Source of fuel: Glucose, fat and in extreme cases protein are used to produce ATP in the presence of oxygen.

By-products: Hydrogen and carbon dioxide

Efficiency: Extremely efficient in its metabolism of fuel, can continue for long periods of time at lower intensities. Is not rapid in beginning like other systems.

Cause of Fatigue: Glycogen stores depletion.

Duration: From Approx. 3min to many hours.

Rate of recovery: Up to 48 hours depending on length and intensity

Note: The three systems do not work independently of each other, but at times one will be more dominant than the others. All three combine to make the human body an efficient user of energy.

Types of training and training methods

1. Aerobic training (with oxygen)

Generates adaptations that improve the aerobic energy system as its main source of energy. 5 aerobic training types

- **Continuous:** Continuous effort lasting at least 20 mins. HR must rise above aerobic threshold. (60-80% of max) e.g. cycling, swimming, jogging.
- **Fartlek:** (speed play) – varied speeds and intensities. Engages both aerobic and anaerobic systems. Effort determined by % of HR but also feel of training. Beneficial for sports where sprints, stops, jogs etc demanded. E.g. soccer, basketball.
- **Aerobic Interval training:** Alternating sessions of work and rest. Can be repeated no. of times, can work both aerobic and anaerobic systems. Rest usually short e.g. 20sec for limited recovery, increasing stress on aerobic system. In type can work hard, avoid fatigue, have competition intensity.
- **Circuit training:** Can make improvements in aerobic capacity, muscular strength/endurance, and flexibility. Moving from one station to another. Greatest benefits with progressive overload principle. Can be made sports specific.

2. Anaerobic training

- **Anaerobic interval:** High intensity work with limited recovery to develop improvements in anaerobic energy systems. At max intensity (85-100) but shorter duration. Develops endurance, power, strength, tolerance to lactic acid. Short anaerobic: less than 25 sec, does ATP/PC systems, Med. Anaerobic: 25sec to 1 min, develops lactic acid system. Long anaerobic: 1-2 min, develops lactic acid and aerobic systems.

3. Flexibility training

Essential for prevention of injury, increased range of motion, improved circulation + healing + coordination, decreases soreness and tiredness, removal of waste.

- Static Stretching: Muscle slowly stretched to position of discomfort and held 10-30 sec. Safe, used for warm-up / cool-down, injury rehab, flexibility.
- Dynamic stretching: Uses speed + momentum to perform movements experienced in game. Reduces tiredness, gets muscles warm. E.g. arm windmilling, kicking with legs.
- Ballistic stretching: Bouncing but not recommended as can cause injury. Can activate stretch reflex (involuntary motion) which can tear muscle. E.g. bouncing to touch toes
- PNF (Proprioceptive neuromuscular facilitation). Lengthening muscle against resistance. Static stretching and strength development. An isometric contraction and period of relax in lengthened position. E.g. lying on back and partner pushing legs back.

4. Strength training

Causes adaptations in muscles for improved strength, power, helps injury rehab, muscular endurance. Generally uses resistances. Causes muscle hypertrophy (growth of cells)

- Free/fixed weights: body has to lift weights to improve certain muscle groups
- Hydraulic: Resistance felt through entire movement, gravity does not assist, does not risk weights falling.
- Resistance bands: Bands provide resistance with properties of tension.

Types of training in sports – Comparison

100m sprinter: Anaerobic interval/circuit, high intensity, long rest periods, many reps. Strength + power → fixed/free weights; low reps, explosive actions. Flexibility → static, dynamic, PNF. All major muscle groups trained.

Endurance Cyclist: Aerobic continuous, Fartlek, circuit (60-80% intensity), Flexibility: static, PNF, dynamic. Strength: endurance, power, high reps with low resistance. Concentration on leg muscles, low rest times.

Principles of Training

1. **Progressive overload:** Gains in fitness will occur when training load is higher than normal, and progressively increased causing adaptations to be made. When adapted to new load, increase it again.
2. **Specificity:** Training to be specific to sport. Greater gains made when activity of training resembles movements in competition.

Reversibility: If training ceases, gains made previously can be lost. Greater the gains, greater the potential losses.

3. **Variety:** Same drills can lead to boredom, loss of motivation. Need new skills and techniques to be tested/learned. Must ensure still specific. E.g. to improve cardio can use jogging, swimming, cycling. Cross training also beneficial.
4. **Training Thresholds:**
 Aerobic: level of intensity sufficient to cause a training effect. Approx. 70% of max. HR
 Anaerobic: Level of intensity in exercise where training effect is caused on anaerobic system. Between these thresholds is aerobic training zone (see sheet). (above aerobic and below anaerobic)
5. **Warm-up and cool-down:**
 Reduces risk of injury, increases body temp. prepare for exercise mentally, stimulate cardiovascular system. Warm up should include aerobic activity, callisthenics (e.g. jumping up and down), skill rehearsal, stretching after warm.
 Cool down follow competition or training session; purpose to minimise muscle soreness, remove waste, cool down, replenish body systems, improve circulation.

Aerobic Training	Principles of Training	Resistance Training
Increased distance + time, increased intensity, harder movements.	Progressive Overload	Increased loads, reps, weights, lower rest times, more sets.
Specific to competition, using certain muscle groups, energy systems	Specificity	Specific muscle groups trained
3-4 times in solidify and gain	Reversibility	Need 3-4 times a week to solidify improvements
Other training types, circuit, fartlek, cross training	Variety	Different weights, plyometrics, circuit, using body as weight
60-80% max HR, in aerobic training zone	Training Thresholds	Increase in difficulty, do with lactic acid in body, less rest times.
General aerobic, flexibility, calisthenics, lower intensity.	Warm-up/Cool-down	General aerobic, stretching muscles used, calisthenics.

Physiological adaptations in response to training

Body will make many adaptations in response to training, some immediately visible and others taking up to 12 weeks to realise benefits. Following will occur

1. Resting Heart Rate

A trained athlete will have a lower resting HR due to efficiency of cardiovascular system. Highly conditioned can have as low as 30bpm. Body will recognise start of training earlier to have higher HR in training and lower HR quickly after training finished. E.g. 75 untrained to 65 trained.

2. Stroke Volume (amount of blood ejected in single contraction by L. ventricle. mL/beat)

Long term effect of training is an increase in SV. Higher at maximal exercise, blood volume can also increase during training. With training, ventricle enlarged and contractions are more powerful, so less are needed. E.g. untrained 100mL per beat, trained 160mL per beat.

3. Cardiac output (amount of blood pumped by H per minute) ($HR \times SV = CO$)

E.g. untrained, 15-20L per minute and trained, 20-25L per minute and can go up to 40L. Means heart is more efficient, better trained has better CO because of stroke volume (as their HR is actually lower than untrained)

4. Oxygen uptake

Maximal O₂ uptake or V_{O2} max regarded as best test of cardiovascular endurance. High V_{O2} shows superior oxygen delivery system and contributes to max performance. Expressed in mL of O₂ per kg of body weight, per minute.(mL/kg/min) E.g. 45mL/kg/min 17 y.o guy → 52mL/kg/min with training.

5. Lung Capacity

Oxygen absorbed in lungs, total lung capacity about 600mL for males, less for females. Vital capacity increases slightly (amount of air can be expelled). Residual volume (air that cannot be moved out) shows a slight decrease.

6. Haemoglobin level (substance in blood that binds O₂ and transports it round body)

Hmgln in red blood cells. Hmgln levels increase in training → increases oxygen carrying capacity. Can increase from 800gm to about 1000gm per 100mL of blood. 20% increase

7. Muscle Hypertrophy

Size of muscles become larger due to increase in mass and cross-sectional area. Growth results in increases in: actin and myosin filament, myofilaments, connective tissue.

8. Effects of Fast and Slow twitch fibres

ST (slow twitch, or type 1): slowly contract for long periods of time (red fibres) For endurance activity.

FT (fast-twitch, or type 2): Reach peak tension quickly and for power/explosive movements (white fibres)

Benefits to slow twitch muscle fibres: hypertrophy, capillary supply increase (rate of exchange up), mitochondrial function (energy factories of cells increase in no. and size), myoglobin content (transporting O₂ up), oxidative enzymes (level of o.e up)

Further adaptations for fast twitch fibres: ATP/PC supply and efficiency increase, glycolytic enzymes increase, better toleration of lactic acid.

PDHPE CORE 2 Notes – Factors Affecting Performance

How can Psychology Affect Performance?

Mental preparation is just as important as physical preparation for improving performance. Factors: motivation, relaxation, arousal, concentration, rehearsal, anxiety.

Motivation

The driving force within us. Motivation pushes individuals beyond comfort zone to produce superior performance.

- Positive motivation

When driven by previous reinforcing behaviours (winning awards, success, praise, money etc) Coaches must continually strive to find unique ways of reinforcing desired behaviours. E.g. incentives, progress charts. Positive effective for long term.

- Negative motivation

Improvement because of fear of consequences. E.g. work hard in fear of being dropped from the team or shouted at. Negative can lead to long term mental damage, lack of confidence, lack of creativity, fear of wrong choices. Can be effective in short term but in long term damaging. Neg → punishment. Pos. → Reward.

- Intrinsic motivation

From within individual. Serve to drive, succeed, accomplish etc by performing at best level. Self-sustaining because is self-reinforcing and personal achievement becomes a reward. Can help with motivation when no one is paying attention e.g. to train harder or further physical attributes.

- Extrinsic motivation

Individuals motivated by some factor outside of self. Comes from reward e.g. money, recognition, praise, trophy. May be necessary to motivate athletes to new levels.

Examples of motivation

Working hard on technique to be better than other players – P, I

Watching passing so don't get yelled at – N, E

Only performing for spectator applause – P, E

Trying so that the person doesn't feel bad about themselves – N, I

Different motivation types are effective for different sports. E.g. for golf → Positive and Intrinsic most effective because will need to practise heaps without external recognition and will have long term drive if doing it for reward.

Boxing meanwhile can use negative as well as extrinsic because fear can cause heightened emotions, arousal, adrenaline etc good for fighting. Also will fight in front of people and motivation to get recognition can be rewarded.

Anxiety and Arousal

- Anxiety

A psychological process characterised by a fear or apprehension in anticipation of confronting a situation perceived to be potentially threatening.

- Trait Anxiety:

How each individual responds to stress. Varies from person to person; what will prompt anxiety in one person may not generate any emotion in another. Most people can be calmed/controlled by relaxation, reassuring, planning, positive comments.

- State Anxiety:

Heightened presence of distress in response to a particular situation. Again will vary from person to person. E.g. high pressure penalty kick

- Sources of Stress

Internal: e.g. self-esteem, self-expectations, level of preparation, fear of failure, will to succeed, attitude to situation.

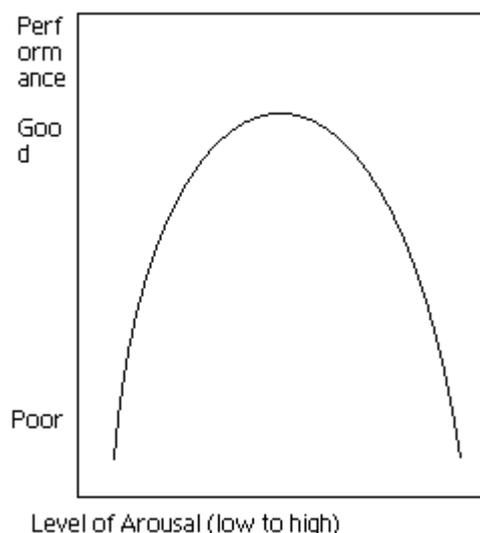
External: Reaction to opposition, focus on event, planning, aspects of environment, skills, media, expectations, crowd.

Under control: Athletes reaction, mental state, attitude to opposition.

Not under control: Injury, illness, media, environment. (some overlap for example media is external and not under control)

- Arousal

Different from anxiety. Arousal is essentially a physiological process. Levels vary with athletes, generally the more anxious, the less arousal needed.



Skills + performance → successful when level of arousal is optimal. Inverted 'U' pictured – shows performance against level of arousal.

At left – low level arousal and performance

Middle top – high level arousal and performance – balance of motivation, ability to control.

Right – excessive arousal, poor performance caused by anxiousness, tension, mental confusion.

Psychological Strategies to Enhance Performance and Manage Anxiety

- Concentration / Attention skills (focussing)

Focussing on process rather than result. Focussing also, only on aspects that you have direct control over. Athletes need to know what to focus on at particular times and adapt to changing situations. E.g basketball free throw shot and blocking out crowd

Need to maintain established routines, self-talk and avoiding negative thoughts.

- Mental Rehearsal + Visualisation + Imagery

Used to enhance competition performance and skill acquisition. Mental repetition of a movement to increase familiarity and comfort in performing a motion. Skill is pictured before being performed.

Mental rehearsal has chance for 'perfect practise', and elevates to level of arousal needed. Helps also to exclude distractions, + thoughts for success.

- Relaxation techniques

Series of techniques that seek to control body's response to stress and control arousal. Common techniques used: progressive muscular relaxation, mental relaxation, self-hypnosis, meditation, centred breathing.

- Goal Setting

Should be smart. Specific, Measurable, Action Oriented, Realistic, Timely (short or long term)\

Goals will help motivate to achieve, while giving less anxiety in that the level of achievement is given and focus can be central to the goal. Actions to be taken are known and athlete knows the goal is achievable.

PDHPE CORE 2 Notes

How can Nutrition and Recovery Strategies affect performance?

Nutritional Considerations

- Pre performance

Nutritional Considerations

- Nut. Balance essential for optimal physical performance.
- Specific roles of both Carbohydrates and Hydration 2 most important considerations.
- Type of foods consumed before competition affects energy production and use.

Fluid is important → cooling heated muscles, temp. Regulation, dilutes toxic wastes, aids O₂ transport, removal of CO₂, prevents dehydration.

Nutritional strategies: (include what types of foods and amounts, when to eat/drink, how to carbload)

Types of foods:

Food high in fat, protein and fibre → longer periods to digest. If solid food is difficult to digest, then liquid meals can be used.

Advised to eat complex carbs with low GI (e.g. pastas, cereal, breads, fruits) as they provide energy release over longer periods of time. Should not eat new foods prior to competition.

- During Performance

In endurance events, need for carbs, electrolyte replacement, depends on intensity, duration, humidity, clothing type, individual sweat rates.

Electrolytes are salts, minerals, such as sodium, potassium, calcium, magnesium that important → body functions such as chemical breakdown + nerve conduction.

Nutritional Considerations:

Aim to conserve muscle glycogen and maintain blood glucose levels. Carb supplementation needed to avoid glycogen depletion. Liquid carbs feeding delays glycogen depletion up to 30 mins.

Glycogen supp. Not needed → low duration/low intensity

Adequate hydration to be maintained. Fluid replacement plan needed > don't wait till thirsty to drink.

Important for hydration: Hydrate before, during, after. Drink every 15-20 min in exercise, water/sports drinks recd, ensure acclimatised to conditions, avoid excess fat, salt, alcohol.

- Post-performance

To return body to pre-event state as quickly as possible. Through proactive recovery (refuelling and rehydrating until state obtained)

Best achieved – high intake carbs and high intake high GI foods + drinks.

Foods that digest quickly = high GI, elevate blood sugar levels (e.g. lollies, sports drinks)
Foods that digest slowly = low GI, do not cause swings in sugar blood levels. (e.g. porridge, pasta)
Low GI best for pre-event, high GI for during and after.

- Comparison of special dietary requirements of Football vs Netball

Similarities: Need to carb load, high energy diet, lots of hydration, planned meals and snacks, high energy fluids (e.g. sports drinks and milkshakes), alcohol not recommended. During performance rehydrate, after performance organise hydration, snacks, meal directly after match.

Differences: Netball – iron deficiency an issue so extra iron should be incorporated into diet. Should eat iron rich foods (red meat e.g.) and foods that help iron consumption. Football – Focus more on bulking up and gaining muscle; protein rich foods to be incorporated into diet as well as extra carbs, vitamins and minerals.

Supplementation

Found in many forms, however not needed with a balanced training diet. Only if have deficiencies.

- Vitamins/Minerals

Vitamins: Inorganic compounds, essential to maintaining bodily functions. Required for chemical reactions that assist enzymes in breakdown of food.

Excess intake of vitamins can be dangerous. Although some can be excreted by urine, some interfere with absorption of others and can cause fatigue or muscle/joint pain.

Minerals: Inorganic substances found in body that are necessary for body to function properly.

Iron and **Calcium** most commonly deficient in athletes. If deficient in iron → haemoglobin levels down and affects performance and can cause health problems. Also can cause 'sports anemia' with low iron. Lots of iron in lean meat, grain products, dark/leafy veg.

Most risk of iron deficiency: endurance athletes (sweat loss), females (menstrual blood loss), vegetarians (lack of red meat), adolescent males (growth spurt)

Calcium deficiency more related to health than energy supply. Calcium sources; dairy products, fish, leafy/green veg.

Most at risk calcium deficiency: Females → insufficient dairy, or menstrual cycles ceased.

- Protein

Minimal role in energy production (only used in extreme circumstances). Well-balanced Western diets will have ample protein. No strong evidence for protein suppl benefits.

Strength athletes, endurance athletes + adolescents in growth spurts may gain benefit from protein suppl. Generally require 1 gram per kg of body weight per day.

- Caffeine

A diuretic (increases amount of fluid passing from body). These diuretic properties contribute to dehydration. Caffeine though has performance enhancing (**ergogenic aid**) and can mobilise fat stores earlier in endurance events for energy release, leads later to a glycogen sparing.

- Creatine Products

Produced by body cells and from food intake. Converted into Creatine Phosphate → assists resynthesis of ATP. Effective in explosion events e.g. weightlifting

Suppl. Supported by many athletes, many researchers found little if any benefit, as body does not store excess amounts of Creatine. Can increase muscle size and appearance through increased water retention. Large doses of creatine can have negative health effects, especially to do with renal (kidneys)

Recovery Strategies

Aim to ensure athlete can resume normal training and competition within given time span. Active rest regarded as most beneficial – allows physiological and physiological revitalisation. Recovery important → avoid overtraining.

1. Physiological Strategies

Focus on removal of metabolic by-products, nutrition plan to replace lost fluids and energy. Cool down used to remove waste, prevent muscle soreness, stretch, remove lactic acid, prevent blood pooling.

Nutritional plan addresses fluid and solid intakes. Includes diet of coming days → regarding fluids and solids.

2. Neural Strategies (aim to relax muscles, recently popular)

Hydrotherapy: use of water to relax, smooth, assist metabolic recovery. Allows active, low impact exercises, and can be used in conjunction with cryotherapy in some cases to promote blood flow.

Massage: Prior to or after event. Extends cool-down, mental relaxation. Can relieve muscle tension/soreness, eliminate toxic by-products, promote flex. Prepares for next performance.

3. Tissue Damage Strategies

T. damage can be minor to more long term.

Cryotherapy: cooling to treat injury or quicken recovery from performances. Ice most often used → cryotherapy slows down tissue inflammation, prevents build up of waste.

RICER principle used, sometimes without R so it is just ICER. Ice on and off every 10 min for 40 mins. Can have repetition periodically for 2 days.

Ice baths are used and rely on body's blood vessels to contract (vasoconstriction) in ice. When emerged, blood vessels enlarge so O₂ rich blood goes to muscles for recovery.

4. Psychological Strategies

After hard exercise → psych. Recovery is needed (emotional and mental). Some methods are specific while some are simple e.g. reading or watching TV

If there is mental/physical tension → not full recovery. Sleep considered main psychological and physical recovery strategy but if not mentally relaxed sleep will not be as effective.

Some use strategies like: Progressive muscular relaxation, yoga/deep breathing, mental relaxation techniques.

PDHPE CORE 2 Notes

How does the acquisition of skill affect performance?

Stages of Skill Acquisition

Acquisition of skill is a gradual development process that requires our cognitive (thinking process) working with our physical abilities.

1. Cognitive Stage

Player gains understanding of task required, conceptualisation (mental picture) is essential Demonstrations important with important points highlighted, but info overload must be avoided Learner will encounter problems depending on difficulty, feedback → crucial, should be continuous and positive.

Movement drills in this stage to improve coordination and feel for movement.

2. Associative Stage

Emphasis on practising correct technique and repetition. Some errors removed but not all, feedback still essential.

Mind and muscles get trained → muscle memory. Fluency + smoothness develop as **Kinaesthetic sense** improves. Learners can remain at this stage long periods of time.

3. Autonomous Stage

Ability to automatically execute skill – properly sequenced and performed instinctively Temporal patterning → blended, fluent, smooth. Able to adapt skill to in-game decision making without having to think about the execution of the skill.

Can recognise and correct own errors.

Characteristics of the Learner

Speed at which learners acquire skills depends on a no. of factors Use CHAPP acronym

Confidence – Heredity – Ability – Personality – Prior Experience

1. Confidence

Belief in one's own ability. Critical in motivation to learn, creativity, and energy. Confident people can help self and others, can approach situation with feeling of ableness.

2. Heredity

Genetic characteristics inherited (gender, height, conceptual ability) → Unchangeable, and can limit dimensions of potential. Relative % of fast/slow twitch fibres makes one more suitable to certain events. Somatotype is also big factor.

Ectomorphy (linearity), Mesomorphy (muscularity), or Endomorphy (roundness) are the three types.

3. Ability

Ease with which an individual is able to perform a movement or routine. Incorporates a range of factors such as sharpness, perception, intelligence etc. Some learners able to recognise patterns, skills, concepts etc. Also called 'natural talent'.

4. Personality

Individual's characteristics of behaving. Traits such as willingness to learn, determination, dedication, consistency, reliability will help learning process.

5. Prior Experience

Easier to learn a skill if similar movements have been done successfully.

The Learning Environment

- Nature of the skill - (skills can be classified according to specific criteria)

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1. Open and Closed

Open skills in an environment that is unpredictable and dynamic. Uncertainties – weather, opposition, playing surface, tactics, teammates. May need to modify techniques to adapt to changes. (e.g. surfing)

Closed skills occur in stable and predictable environment. Generally self paced, easier to learn. (e.g. ten-pin bowling.)

2. Gross and Fine

Gross requires use of large muscle groups. E.g running. Fine requires small muscle groups e.g. darts

3. Discrete, Serial and Continuous

Discrete has a beginning and end that is distinctive. E.g. golf swing

Serial has sequence of smaller movements (2 or more discreet) assembled to make a skill. (e.g. conversion)

Continuous has no distinct beginning and end. E.g. running.

4. Self Paced and Externally Paced

Self-paced where performer determines speed and execution e.g. tennis serve

Externally paced where an external source determines timing e.g. batting in cricket

- Performance Elements

Include decision making, strategic development and tactical development. A game-centred approach needed to develop performance elements. Approach focuses on whole game and components within it.

1. Decision-making

Best improved by having to make decisions in performance-like pressure situations. Best achieved through observation, questioning, whole, part, specific roles, variation, creativity.

2. Strategic and Tactical Development

Refers to way we play, what we should be doing, decisions should be made. Tactical awareness about ways of gaining an advantage over opponent. 3 principles are **Technical efficiency, understanding and skill execution**. (need to be practised in game situations)

- Practise Methods

1. Massed and Distributed

Massed involves a continuous practise session with short rest intervals e.g. shoot 50 baskets then rest 1 minute. Massed works best with fresh, motivated athletes who might be unable to attend lots of sessions.

Distributed involves broken practise session with intervals of rest or alternating activities. E.g. shoot 10 baskets, do dribbling. Can work with not highly motivated people, when fatigued, when task is tiring and difficult. Promotes variety.

2. Whole and Part

Whole is practising skill in entirety. Generally used for easy or simple skills. Part practise involves breaking it down into smaller components or sub-routines. Used for complex skills with beginners. Combination is sometimes used so see whole skills then break it down. E.g. lay up

- Feedback

Info about how skill is being performed or was performed. 3 main functions

Provide basis for correcting aspects that need improvement. Motivate and encourage performer. Reinforce what is being done correctly. Types of feedback:

1. Internal: Comes through senses inside body. Movement is felt and relayed to brain, as adjustments made if necessary. Helps develop kinaesthetic sense for movement.

2. External: Outside sources. E.g. coach or someone who saw skill
3. Concurrent: Received during performance of skill. E.g. handstand
4. Delayed: Received after skill is executed. E.g. after soccer shot.
5. KR (knowledge of results): Outcome of movement. Suggests how skilful movement is. E.g. goal was scored.
6. KP (knowledge of performance): Information about movement during execution and way skill was performed. Quality of execution of skill. Can be external or internal

Feedback essential in improving performance. Best works immediately and positive.

Assessment of Skill and Performance

- Characteristics of Skill and Performance

1. Kinaesthetic Sense

System of sensitivity that exists in muscles and their attachments. Skilled performer → well-developed K. sense. Allows them to feel movement as they perform it. Can even make corrections while performing movement.

2. Anticipation + Timing

Able to predict what may happen in specific situations. E.g. speed of ball, where it will land, when kick will be effective. Allows more time to respond, anticipation is also necessary for externally paced activities. E.g. basketball, cricket.

3. Consistency

Skilled performers → high quality consistency. Can repeat desired movement in high-pressure situations. E.g. tennis, golf

4. Technique

Good technique will be carried out in a safe, effective, efficient, and aesthetically pleasing manner. Movement will have better chance of being successful, will withstand pressure better, and less chance of injury if technique is proper.

- Objective and Subjective Performance Measures

Measurement is the process of using numeric info to assess a particular physical ability, presented in the forms of times, scores, distances, guidelines. Greater accuracy of measurements means more reliable data.

Subjective observation: Judgement of performance based on feelings, opinions, impressions.

Objectivity: Extent to which a measure or test is independent of observer. Runs on continuum from highly objective to slightly subjective. High jump highly objective while fencing requires interpretation so is subjective.

Observations can be made using:

Checklists (style, technique, technical correctness, sequencing execution).

Measurement systems: Measuring tapes, electronic timers.

E.g. Basketball shot. Objective: 2 points scored. Subjective – defence was out of position.

Established criteria: Set of procedures, rules, guidelines.

Rating Scales: Degree of difficulty that awards marks for difficult movements.

- Validity and Reliability of tests



Validity: Honesty of a test, degree to which it measures what it is supposed to measure.

Techniques used to enhance validity include: judgement about test item, using already validated but similar tests as indicator, accuracy in prediction, ensuring test items contain component being validated. Use of range of measures strengthens a tests validity.

Reliability: Ability to be repeated with consistent, accurate results.

- Personal versus Prescribed Judging Criteria

Personal Criteria: Preconceived ideas or expectations of an individual. E.g. coach to select his team. Spectators also use these criteria to judge teams based on feelings.

Prescribed Criteria: Established by sports org and form basis for assessment for competitions in that sport or activity.

Will absorb elements of subjectivity into a more objective framework. Use of checklists, rating scales, etc. help to accurately convert appraisal into measurements such as scores. Judges are prescribed with criteria produced by sports org.

