

Part 2- Detailed Training Session

Week 2, Day 5

(For detailed session, refer to page 6)

Functional training employs gross motor skills to increase balance, posture and core strength. This training session focuses on strengthening the athlete's core, enabling them to play more precise and controlled shots. The activities are performed in a closed environment as there are no external influences; they also have a definite beginning and end, making them discrete. The athlete controls the pace that the activities are performed at, therefore they are self-paced. It is important that the athlete completes a thorough warm up that is specific to the session. This ensures that the athlete is physically and mentally prepared for the activity. The warm up should begin with gross motor movements such as high knee jogging and jogging with large arm circles. Stretches should then be performed. Static stretches, focussing on the hamstrings, quads, hip flexors, abductors, abdominals, pectorals, deltoids, obliques, lower back and trapezius should be held for around 20 seconds and repeated twice. PNF stretches are used to increase muscle length through isometric contractions. These should concentrate on the hamstrings, quads and shoulder regions. Ballistic stretches should also be used under the supervision of coaches to increase the length of the muscle and increase blood flow to the area. Ballistic stretches are effective in lengthening hamstring muscles and lower back muscles. Callisthenics should follow stretching to raise body temperature, increase blood flow and prepare the body for activity. The athlete should cool down after the session to disperse accumulated lactate. This prevents the athlete experiencing soreness. Gross motor movements performed at a low intensity should be used to gradually reduce the body temperature and remove lactate. Light stretches should end the session to restore muscles back to their normal length and remove the last of the lactic acid. As the athlete adapts to the load of the activity it should be increased gradually to allow the athlete to increase their muscular strength and endurance. The athlete's core strength is tested every four weeks to assess the effectiveness of the program. Tests that are specific to the activity are used to ensure that the tests are valid. For the results of the assessment to be valid the athlete must do their best. This ensures that they are accurate and reflect the athlete's ability and progress. The sit-up test, 7-stage test and resistance tests using 1-RM provide good indicators of the athlete's core strength. These tests provide objective results that can be used to produce a learning curve, showing trends in the athlete's development. The curve produced should be negatively accelerating as the athlete's gains will become less as the increases in load become smaller and the athlete reaches their peak performance.

Developing flexibility is an important part of the athlete's training regime. Increased flexibility allows the athlete to have a greater range of movement and lowers their risk of soft tissue injury. Increased flexibility also leads to an increase in muscle power as it allows for a longer eccentric contraction. Yoga is used to increase the athlete's flexibility in the key areas identified. The session focuses on lengthening the muscles in the hamstrings, quads, lower back, core and shoulders. This provides the athlete with a greater range of

movement, allowing them to move around the court with more efficiency and manoeuvrability. Greater flexibility also reduces the risk of the athlete injuring muscles, ligaments and tendons in those areas. Massed practice is used in this session. The athlete completes the activities with little to no rest in between. This is possible as they are focused on their goals and provided with material reinforcements to train, leading to their high level of motivation. The athlete is tested periodically to determine whether the program is effective. The sit and reach test uses objective measurements to test the flexibility of the lower back and hamstrings, two areas that require a high amount of flexibility. Tests that provide objective results are more reliable as they remove human input, which can be biased.

Resistance training is used to increase the athlete's strength and power. To increase strength and power, a high load should be used with a moderate number of reps and a low number of sets. The weight should be lifted slowly, through the full range of movement. The athlete should be supervised by a trained physiologist when performing strength training; this ensures that the correct technique is being used and that the athlete is working safely. Strength training involves gross motor skills as it uses large muscle groups. The movements have a definite beginning and end position and are therefore discrete. The activity is performed in a predictable, closed environment and is self paced. Progressive overload is used to increase the athlete's strength. Objective tests are used to test the strength of the athlete and their muscle balance. Adequate muscle strength is important in order for the athlete to be able to move around the court with speed and efficiency. Muscle balance is required to prevent muscle strains. If a muscle contracts with too much force, its antagonist pair may be damaged. To prevent this, the muscle pairs should be strengthened evenly and tested to avoid unnecessary injury. Methods using resistance provide quantitative results that are non-biased. To prevent lactic acid accumulation during the session, sufficient rest should be provided between sets. Due to the high load being lifted, at least three minutes rest should be given between sets. Rests between sets should be active; this involves the athlete doing some form of low intensity, gross motor movements. A thorough warm up should be completed before the session to increase muscle length. This is important as the tension created by lifting heavy loads can cause muscles to snap. The warm up should begin with gross motor movements. This aspect of the warm up should include light jogging, high knee jogging, leg flicks and large arm rotations. The purpose of this is to stimulate increased blood flow and ventilation rate, resulting in a higher oxygen intake and distribution. Static stretches should be used to increase muscle length. They should focus on the hamstrings, quads, gastrocnemius, tibialis anterior, abductors, hip flexors, lower back, pecs, deltoids, trapezius, triceps and biceps. PNF stretches use isometric contractions to increase muscle length. They should focus on the large muscle groups, hamstrings, quads and shoulder region. Ballistic stretches are used to increase muscle length through rapid movements. A cool down session is used to remove lactate that has accumulated as a result of anaerobic glycolysis. This involves low intensity gross motor movements that address all upper and lower body muscle groups. Light ballistic, PNF and static stretches should end the session to restore normal muscle length and

remove any lingering lactate. The athlete should follow a negatively accelerated learning curve throughout the training program. As the athlete nears the peak, the increases in strength will become smaller. A plateau may be observed if the athlete ceases training or as the athlete nears their peak and the increases become minimal. It is important that strength training programs use the principle of specificity to ensure that maximum benefits are obtained. The program should be specific for the athlete and designed from pre-testing results. This ensures that there is a minimum risk of hard and soft tissue injuries.

The athlete has been training at a high level for a number of years. Even though they are capable players, they require training to improve their skill level and remove errors from their game and are therefore in the associative stage. Feedback is also required from coaches to improve their technique. The stage of skill acquisition affects the complexity of the drills used and the rate that the athlete learns at. An athlete in the cognitive stage will have lower self confidence and a lower ability. As the athlete is in the associative stage, it is possible to use advanced drills to improve their level of skill. The autonomous stage will be reached once the skills and movements become automatic to the athlete and their rate of errors is low. This will allow the athlete to concentrate on their opponent and anticipating their shots instead of focussing solely on creating their own shot. Once the autonomous stage has been accomplished, the athlete must still sustain an intense training program. This ensures that muscle memory and fitness is retained.

To improve the athlete's skill, routines that use closed and self paced skills are used as well as drills and routines that are open and externally paced. Closed skills are used as they are less complex and are generally self paced. They also allow the coach to analyse individual parts of the athlete's technique. Muscle memory movements are an important part of the athlete's training. They develop kinesthetic sense; increasing the player's feel of the court, allowing them to move more efficiently and subconsciously. Muscle memory movements also improve technique and develop the fitness components, allowing the movement to be autonomous. Movement patterns are closed skills; they are performed in a predictable environment (no ball or opponent). They are self paced as the athlete chooses a speed that is comfortable for them to perform at for a sustained period of time. Movement patterns use part practice to break the skill down into parts, this makes it simpler for the athlete and allows them to perfect their position and swing technique. The main focus of muscle memory patterns is precision; accuracy is preferred over speed. Speed may be introduced as the athlete develops kinaesthetic sense, timing and consistency. Introducing a ball into the movement creates a problem solving situation, making the skill more complex. The athlete is forced to decide when to play the ball, how much pace to put on it and where to place it. The skill also becomes less predictable to the athlete. The pace of the exercise is determined by the coach or feeder. Due to the variables that are now introduced, the athlete may find it difficult to perform the skill at a high standard. As they become more experienced the athlete will progress from the associative stage to the autonomous stage where errors will be removed and the skill will become more consistent. At this point, their

timing and positioning will be automatic, allowing them to focus on their opponent while they play their shot. The athlete must remain practising these skills when they reach the autonomous stage to retain muscle memory. These drills are serial skills; they combine a number of skills that have a definite beginning and ending. Massed practice is used for this session as repeating the skill over and over will inscribe it into the athlete's brain. It is possible to use massed practice because the athlete holds a high level of fitness and motivation, preventing boredom or fatigue. Throughout this part of the session the athlete is receiving concurrent feedback from themselves and their coach. This allows them to modify their technique while performing the drill. They are also able to receive delayed feedback after the session from coaches, although this method is less effective as the athlete may forget it quickly. Video sessions provide an effective form of delayed feedback, allowing the athlete to see their errors and also the positive aspects of their game. The athlete is provided with subjective knowledge of performance that is based on a criteria set by the coach and themselves. The criteria assess the effectiveness of the shot and the aesthetic features of the athlete's technique that affect their shot. The coach focuses on the athlete's approach and position, balance, stroke technique, length, pace, and their recovery to the 'T'. If any of these criteria are not technically correct the coach will immediately correct them in order for the athlete to play an effective shot. Introducing criteria set by the athlete and the coach into the assessment of the athlete makes it more objective. As a result the assessment is less biased and the results are more valid. The tests should also be specific to the skills required in squash. Every four weeks the athlete undergoes a skill analysis. The athlete is forced to perform a series of skills without pressure and with pressure to determine their quality of performance. The coach assesses the athlete against the set of criteria described above. A skilled performance by the athlete may lead to internal and external positive motivation and positive reinforcements. An unskilled performance may lead to a decrease in the athlete's confidence or negative motivation. Through the frequent assessment of the athlete's skills learning curves can be produced to show trends in the athlete's progress. A positively accelerated learning curve is the most desirable trend as it will lead to the athlete reaching their peak performance much faster. If the athlete stops training or loses motivation then a plateau may appear in the curve which represents no increases in their skill.

Due to the player's high level of experience and their status as a professional athlete they can be regarded as a skilled performer. This sets them apart from unskilled performers as they have a high kinesthetic sense, providing them with; muscle memory, a low error rate, and an awareness of technical errors. They can also modify their technique under pressure to produce a winning performance. The anticipation and timing of a skilled performer is much more precise than an unskilled performer. This allows them to read their opponents position in order to prepare themselves for the next shot. Skilled performers are also able to time their swing perfectly to produce an accurate and effective shot. Timing also refers to the athlete's ability to create a flowing shot that appears to be balanced, coordinated and controlled. Activities such as; muscle memory patterns and practising a single shot increases the athlete's kinesthetic sense and improves their timing. Skilled performers must be

mentally strong. This allows them to remain focussed on playing their game under pressure and keep their self esteem and confidence levels high. Mental toughness also increases their ability to focus and visualise a positive and skilled performance. Full time training requires a high degree of motivation and mental discipline, features uncommon in unskilled performers. Activities that increase the athlete's mental game are included in various sessions throughout the game. Sessions that focus on the athlete's skill also develop their mental game by providing positive reinforcement and motivation. They also increase their ability make decisions and anticipate the balls trajectory. A skilled performer shows a high level of consistency. This is made evident by their ability to produce effective shots, especially when under pressure or when out of position and their low number of unforced errors. Consistency is produced through the repetition of the skill using massed practice. Skilled athlete's provide a performance that is more technically and aesthetically pleasing than unskilled performers. Their strokes are balanced, fluent and precise and their movement is efficient and flowing. This is often backed up by results that motivate the athlete and lead towards the achievement of their goals. Due to the athlete being skilled intense training and advanced drills can be commenced from the beginning of the program. If the player was unskilled they would require basic drills to develop their coordination and timing. They would also require lack fitness and mental strength.

The rate that the athlete develops these skills depends on their conceptual ability, attitude towards their coach and training, their enthusiasm and confidence, the amount of time they spend on skills and their inherited somatotype. Accurate feedback from coaches is also essential in developing skill. If the athlete is provided with incorrect information their progress may be inhibited.