



Kinesiological Principles Involved in Table Tennis a Theoretical View

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Abstract

The paper is highline the Kinesiological Principles including in the Table Tennis match-up. The creators have illuminated the terms as explicitly identified with body development, position, and its logical standards applied to consider the game positions, and abilities. Kinesiology can be named the logical investigation of the development of the human body. On the off chance that a player needs to turn into a great player, it will be of extraordinary help if both he and his mentor have a sound information on the essential standards associated with explicit subject of sports.

Keyword: Kinesiology, Table Tennis, Theoretical.

Introduction

Table tennis is a sport in which two or four players hit a lightweight, hollow ball back and forth with rackets. The game takes place on a hard table divided by a net. Except for the initial serve, players must allow a ball played toward them only one bounce on their side of the table and must return it so that it bounces on the opposite side. The game originated in England and was played amongst upper class Victorians as an after dinner entertainment. A typical phrase used by some players or coaches expressing their ideas is 'Hit the ball harder'. The player may be hitting the ball as hard as he can. What he really wants is sound advice which pays attention to the need for a longer preliminary backswing, a more definite movement into the ball and an attempt to stroke through the ball instead of 'jabbing' at it. This advice has much more meaning and is far more beneficial. Before talking about the advantages of knowledge of kinesiology in relation to table tennis, it is interesting to note that players can obtain really high-level motor skill and be

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international stars without this knowledge. However, as they have never thought of how they execute the strokes, their explanations can be false and even absurd.

When describing a stroke to someone it is necessary to take into account some of the following factors, and form an analysis.

- 1.Start-of-stroke position and end-of-stroke position.
2. The direction of each joint action (abduction, flexion, rotation etc.).
- 3.Joint actions (sequences).
- 4.Joint actions (speed and acceleration).
- 5.Joint actions (the causes of motive power: eccentric contraction, concentric contraction,etc.)
- 6.Joint actions (timing, coordination and rhythm.).
- 7.The amount of muscular, skeletal or external stabilization that a player requires.(Curtsey, Brain Burn) As well as these points of kinesiology one must consider the pure mechanics of the type of racket used and the speed, direction and spin of the ball travelling towards you, and the speed, direction or spin that you want to impart. When analyzing the table tennis stroke of a player, one should look for strength, power, speed (rate of movement after the start), static precision, dynamic precision, coordination and flexibility.

Warm - up tricks: Specific warm-up exercises on the table, or shadow play off the table, or other Movements that involve coordination and other educable factors as distinguished from activities of pure Physiological function, are more beneficial.

1. Warm-ups are essential in cool climates so as to bring the body temperature up to at least normal level.
2. For non-specific warm-up exercises to be effective it is necessary to cause a rise of one to four

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degrees Fahrenheit in the body 'core' temperature² but one must avoid the onset of fatigue, it is very important to judge the interval between the warm-up and the game,

3. Warming-up definitely decreases the chance of injury in a game.

The ready position: In table tennis it is necessary to prepare for any one of several possible movements. One needs to be able to move quickly in any direction with maximum speed. A player should keep his centre of gravity over the area of his base until he makes a decision to move, but the area of his base should be reduced in size so that a certain movement in the centre of gravity results in an unbalanced position.

Terminal positions: The terminal position in playing a particular stroke is vital because it could well decide the successive stroke. If a player reaches to play a forehand drive but then stumbles off balance, he is penalizing himself because he is unlikely to return to a correct stance in time for his opponent's return shot. In table one must remember that the terminal position of stroke often contributes to the execution of the next.

Follow-through: It is popularly thought that follow-through is a continuation of motion after the contact with the ball has terminated. However, after contact has terminated no action of the body can have any effect upon the path of the ball.

Stabilization and Force: Newton's third law of motion states that to every action there is an equal and opposite reaction. When a player makes a stroke with both his feet on the ground, he applies force equally to the ball and to the earth. Because the earth has a great mass it is very stable and does not move detectably. The player's body moves forward into the ball by rotating at the talocalcaneonavicular joint in the foot just below the ankle joint.

The magnitude of muscle force with which one plays a stroke will depend upon the size and number of fibres being used and the speed at which they shorten and lengthen. When these active fibres are forced to lengthen the result is an eccentric contraction. (Although the muscle is trying to shorten, the resistance overcomes the tension in the muscle.) In table tennis we are nearly always involved at any particular moment with the force of several muscle groups. When the angle of pull becomes more acute a more effective force is usually produced. In table tennis

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the direction and speed of the total body force will determine the force with which the ball is struck. Internally, the bone levers of the body receive their force at points where muscles begin or are inserted. The point of application is where the racket touches the ball. Since $\text{force} = \text{Mass} \times \text{acceleration}$, the ability of a player to apply force depends not only on strength but also upon speed.

Abridgment of forces: From a mechanical point of view the main problem in many types of attacking strokes is that of creating maximal acceleration with each segment of the body. It is necessary to utilize all forces available so that the total is maximal. This really involves the summation of forces. In the end, if we presume that all forces come from muscle contraction, there are two basic ways of concentrating the forces from different muscles.

Work : When applying all these forces towards a sound stroke one is overcoming resistance, and this is called work. One gets the capacity to do work through energy and the energy a racket has, by virtue of its motion, can be termed kinetic energy. It is a natural law that energy can neither be created nor destroyed, so it follows that a table tennis player cannot use more energy than has already been absorbed. This, therefore, stresses the importance of specific fitness training if one hopes eventually to improve the force of one's strokes.

Mass: The force of attraction between an object and the earth is known as weight. This attraction is proportional to the object's mass. This means that a person who has a racket which is heavier than his opponent's must exert more muscular force to counter the earth's attraction.

Centre of gravity: The centre of gravity of the body is the point on which the weight of the body can be considered to be focused. The displacement pattern of the centre of gravity may be regarded as constituting the summation or end result of all forces and motions acting upon and concerned with the translation of the body from one point to another.¹⁵ Naturally, then, the table tennis player's centre of gravity is always on the move. Gravitational force is continually acting in one direction only, and that is towards the centre of the earth. It will act upon each mass particle of the body and the racket in the player's hand.

Angular movement: Many of the movements in table tennis are of an angular character because the joints of the human body create a leverage system that permits mainly rotary or curvilinear

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motion. When angular motion takes place each particle of a rigid body will come along a circular path. The different parts of the rotating body will pass through the same angle in a similar direction in precisely the same time.

Management of angular thrust: Angular momentum is the sum of rotational inertia and angular velocity. The rotational inertia is obtained by multiplying the mass of each particle of the body by the square of its perpendicular distance to the centre of rotation, and summing products for the whole body.

Conclusion

Table Tennis is a popular game among all ages people at the world level and especially in Asian countries. The training of Table Tennis at beginning to advanced level need scientific basis very important to learn. Advantages of knowledge of kinesiology in relation to table tennis, it is interesting to note that players can obtain really high-level motor skill and be international stars without this knowledge. Techniques in Table Tennis cannot be analyzed mechanically, muscle, because physiological laws and mechanical laws will be most efficient in causing motion when it is at a right angle to the moving bone; however, the muscle fibres are rarely fully stretched. Kinesiology can be termed the scientific study for the advances of Sports skills.

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