Chapter XI

THEORY OF BASIC INDIVIDUAL TECHNIQUES

by Hiroshi Toyoda

Players should be taught the following seven fundamental playing patterns as individual skills required in the actual volleyball game.

When players master each fundamental playing pattern, they should be introduced to complex training methods and formation. It will be difficult to attain good team plays in the actual game without the mastery of these seven basic patterns. The coach should master the theoretical background and scientific approach of each pattern for effective explanation to players.

Basic Individual Techniques

1. Fundamental postures and movement in volleyball
2. Pass play and set-up play
3. Spike
4. Service
5. Attack reception and net recovery
6. Service reception
7. Blocking

1. Fundamental Postures and Movements in Volleyball

a. Fundamental postures

There are two kinds of postures: (1) forward players’ posture for quick blocking and (2) back players’ posture for reception of quick attacks from opponents court.
Back court players' posture should be as follows:

Knees should be bent with fingertips placed in front of knees. Body weight should be on balls of feet. Feet parallel or one foot in front of the other. Body weight should be placed forward as much as possible. (Fig 11-1) Heels should not be on the floor.

1 meter forward dash from parallel feet — 0.82 seconds  
1 meter forward dash from one foot forward - 0.82 seconds  
1 meter forward dash from heel on the floor - 0.85 seconds

Arms should be placed as illustrated for fast reactions to the ball for the following reasons:

Speed of Spiked balls:

Spiked ball (men) 27m/sec. (60.6 m.p.h.)  
From net to end line - .333 sec.
Spiked ball (women) 18m/sec. (40.3 m.p.h.)  
From net to end line - .50 seconds

Speed of arm motions in the following actions:

From knee to shoulder .440 seconds  
From shoulder to knee .390 seconds  
From shoulder to knee (turning the wrists) .480 seconds

Correct fundamental posture for back court players is a very important element for accurate reception.

Arms held at waist with hands extended for quick reaction to spiked balls. Prediction or anticipation is very important in fast reaction to spiked balls.

b. Forward Movements

Run forward and stop in a crouch when players pass or receive low.

When players want to return or pass backward, they try a backward roll.
When players master crouching, the coach can then teach diving as an advanced technique for the following reasons.

- 3 m dash forward — 1.33 sec
- 3 m dive forward — 1.21 sec
- 6 m dash forward — 1.94 sec
- 6 m dive forward — 1.87 sec

(in the case of women players)

c. Sideways (set-up, reception, spike and block)

Players should move about 45 degrees diagonally on both sides as illustrated in the fig 11-D1. They should not move to the side as the ball bounces outside depending on its return angle (Fig 11-D2).

When they move sideways 45 degrees diagonally there are three kinds of footwork that players can use:

- Run to the side and stop by side-stepping forward. (Fig 11-2a, 11-2b)
- Run to the side cross-stepping and stop by side-stepping forward. (Fig 11-3a, 11-3b, 11-3c)
- Run to the side, dash to the ball and stop (braking foot work). (Fig 11-4)
Rolling and flying techniques are taught to the more advanced players for the following reasons:

- 3 m 45 diagonal movement using side step 1.51 sec
- 3 m 45 diagonal movement using cross step 1.42 sec
- 3 m 45 diagonal movement using rolling 1.30 sec
- 3 m 45 diagonal movement choosing left or right after judgment 1.61 sec

When players move to the side more than three steps, cross-stepping is useful for quick movements as shown in the above required times.

d. Moving backwards

Run at full speed and turn around. Step backward slowly, keep an eye on the ball, keep low.

e. Jumping (set-up, spike and blocking)

Dash under the ball and keep low. There are three kinds of steps before take off: left and right, right and left, both at the same time. Players should master these three steps for future improvement.

These footwork patterns should be practiced and highly developed. Footwork skill is the most important factor in all volleyball playing patterns.

2. Pass play and set-up play

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<tr>
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<td></td>
<td>Set in crouching posture</td>
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</table>
a. **Coaching hints on overhand pass**

Quickly move to the ball and face the direction where the pass is intended.

Hit the ball with the inner surface of the fingers.

Stop the ball with thumbs and forefingers.

As the ball is stopped with the thumbs and forefingers, the wrists are bent backwards and elbows are bent.

Push the ball upward with the “spring” of fingers, wrists, elbows, waist, knees and ankles. (*Fig 11-5 and 13-20*)

b. **Coaching hints on underhand pass**

Extend wrist and elbows at an angle with the trunk. (*Fig 11-6*)

Angles of ball deflection in underhand pass:

The ball will return according to the angle it is thrown.

In case 1, the ball will deflect upward.
In case 2, the ball will deflect forward.

c. **Coaching hints for setting**

The purpose of the set is to enable an attack. The ball should be set 50 to 100 cm away from the net and at an adequate height above the net. Short sets, back set and advanced techniques in setting should be used so that the opposing team will not be ready for these attacks. For a deceptive set direction, so the opposing team will not be able to anticipate the direction of the ball, slightly arch the back with the chest facing upward (set-posture) especially from low positions. In the jump set, players should hit the ball above the forehead. In setting, accuracy of height and direction of the ball is essential for spiker requirements. (*Fig 11-7*)

Position where the setter can hit a passed ball relative to the ball’s trajectory.

When the ball is traveling over the net, a jump set can be made only at one point.

When the ball is traveling towards the lower part of the net or under the net, a set can be made at one point only.

When the ball is high enough, a set can be made from point A to point B within the limits of the overhand pass. (*Fig 11-D3 and 11-D4*) The set can be made by the spiker simply adjusting his timing.

Setter has to adjust timing according to the approach of quick spikers in this case.
Evaluation of setting play

Aiming at the spikers’ target above the net.
Ability to adjust timing of the set with the spiker’s.
Ability not to give away set-up direction to the opponent’s blockers.
Ability to judge the opposing team’s blockers’ height and skill.
Ability to determine, based on the game’s situation, the best player to set the ball to and, when and how, to let him attack effectively.

3. Spike

a. Structure of Spike Movement

Approach from spiker’s position
Take-off and jump
Arm motion and spiking form
Landing form and moving into suitable position for next play
b. **Coaching Process of Spike Techniques**

Arm motion for spike ▶ Approach ▶ Take-off ▶ Jump and catch the ball over the net ▼
- Jump and hit the ball over net
  - Soft spike (Feint play) (Tip ball)
- Spike the ball set on top of the net
  - Quick Spike (A,B,C,D) from a shoot set
- How to move in the most suitable position before set-up
  - spike the ball set from the back court
  - Spike the ball set at a long distance from the setter
- Spike the ball in various directions
  - Spike in various directions changing the starting positions
  - Spike in various directions from a curved approach
  - Spike in various directions from a change of direction in take-off
- Mastering of three hitting points for changing directions
  - Wipe-off play (blocked-out)
- Balance smash ▶ Rebound play

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**c. Angle of Body at Take-off For Better Jump**

In order to jump higher, players should get in the best body position before take-off. If players bend their bodies too much or too little, they cannot jump higher at take-off. The most suitable body positions are illustrated in the fig. 11-8. Good jumps require powerful muscular coordination.

**d. Three Steps in Directing the Spike Course**

After a straight approach to the net, spike down the line. Then, after a 60 degree-curved approach to the net (from outside the side line), spike cross-court. *(Fig 11-9)*

After a straight approach to the net, spike down the line. Return to the first position and go around in an approach to spike cross-court.

First, try to spike down the line, then, using the same approach, spike cross-court by changing steps at the take off. *(Fig 11-D5, D6, D7, D8)*
e. Soft Spike (Tip ball)

Sometimes soft ball spikes are more effective than hard spikes in the actual game. All teams have weak points in soft spikes or tip ball. As illustrated in the following diagram, there is a need for special training in utilizing soft spike tactics in some phases of the game. (Fig 11-10, 11-D9, 11-D10)
f. **Spiking Techniques Against Strong Blockers**

When a high, strong blocker has been set over the net, spikers should use one of the following two ways to prevent block points:

Use hitting points and block-out techniques (11-D11)
Appeal to utilize opponent’s block or rebound play. (Fig 11-11)

![Diagram](image)

**Fig. 11 D11**

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g. **Quick Spiking Techniques**

Spiking a long, high set over the net will give opposing blockers and receivers time to prepare for the spike. Spiking a short or shoot set is necessary for well-trained teams. There are five basic kinds of quick spikes in volleyball: (Fig 11-D12)

![Diagram](image)

**Fig. 11 D12**

1. Quick A: Quick spike just in front of setter. Spiker has to jump and wait in the air for the short set. (Fig 11-12)
2. Quick B: Quick spike at a distance of 2 to 3 meters in front of the setter. Spiker has to jump at the same time as the setter hits the ball for set-up. (Fig 11-13)
3. Quick C: Quick spike behind the setter.
4. Quick D: Quick spike at a distance of 2 to 3 meters behind the setter.
5. Quick E: Shoot set spike near the left side of the net poles.
An option depending on the point of the set: if the ball is passed to a point 2.5 m off the net and setter quickly moves under the ball, spiker should move and jump from 2.5 m away from the setter.

h. Variations and Combinations of Quick Spike Techniques

Top class teams use many variations and combinations of quick attack combinations to confuse opponent’s blockers and receivers. These variations are typical. (Fig 11-D13, 11-D14, 11-D15, 11-D16)

4. Service

a. Required conditions

The most important thing in serving is to control ball speed and trajectory. It is important to serve the ball into the opponents’ court without error for if the service is faulted, a side-out is called. Speed and sudden changes of the ball trajectory will be effective, but fast serves often result in errors. Fast serves depend on the condition of the game. At the same time, players should have their own specialities in form, kind of ball trajectories and their speed in serving. The coach should know the strengths of his players in serving.
b. Coaching Process in Service

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Arm swing training and concretion of form → Set-up training → Try each service
  
  Jumping service
  
  Back spine service
  
          Controlling service → Placement of service → Changes direction in long and short services

  Underhand service
  Floater service (tennis style)
  Overhand change-up service
  Overhand drive service (round house)

Decision of one service
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c. Control of Service

The following two elements are essential for good service control:

1. Always set up the ball the same and serve with the same arm swing.

2. Practice controlling the serve, ball direction and distance (long or short). Direction change (straight or diagonal) is done by changing the front foot position, not by the toss or the arm swing. *(Fig 11-14, 11-D17)*

(d. Placing the Service

Aim at the weakest player on the opposing team.

Aim behind the setter or at the spot towards where the setter is moving. The setter’s path will be the vacant area in reception. In this case the setter receiving the service may cause an error. *(Fig 11-15)*
Aim at the best or quickest spiker. This may cause the spiker to make an error in the timing of his approach. If this happens, it will cause a negative psychological effect on the team and the player's concentration will be off in the next play. *(Fig 11-D18, 11-D19)*

If the setter is weak in back setting, aim in the opposite direction of where he intends to set the ball. Service is aimed at the spot where the backset will be made. The resulting set will be irregular making a quick attack difficult. *(Fig 11-D20, 11-D21)*

Aim at the substituted player because he will be nervous and will not be in tune with the other players. He is apt to make a mistake.

**e. Effective Service and Desirable Conditions in Service**

Scoring point

Getting a free or chance ball

Opponents not able to pass received ball in attack area to prevent quick attacks
5. Attack Reception

Spike reception is a technique of underhand or singlehand pass patterns. Spike ball speed is increasing each year because of top class players’ physical performance improvement. Considering this, the following elements should be introduced in spike reception training.

a. Elements of training for spike reception improvement

- Position for spike reception
- Anticipation or prediction
- Quick reaction position for ball movement
- Reflexes
- Quick movements in the best direction in reception area
- Dexterity in successive receptions

b. Coaching Process of Spike Reception Techniques

<table>
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<tr>
<th>Starting positions</th>
<th>Posture for spiked ball</th>
<th>Abilities to anticipate the timing and direction</th>
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<tr>
<td>Run under the ball in crouching footwork</td>
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<tr>
<td>Side-steps</td>
<td>Underhand reception in front of body</td>
<td>Underhand reception at the side of body</td>
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<tr>
<td>Cross-steps</td>
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<td></td>
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<tr>
<td>Dash towards the ball</td>
<td>Underhand reception on a diagonal line from the body</td>
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</tr>
<tr>
<td>Backward steps</td>
<td>Diving reception</td>
<td>Rolling reception</td>
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<tr>
<td>Flying reception</td>
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</tr>
</tbody>
</table>

Receivers in the court, as well as blockers near the net, should watch opponents’ quick skip. Fig. 11-D22, 11-D23, 11-D24 demonstrate some common game situations for spike reception.
In order to keep their team reception formation, all players in the back court should keep their positions before the start of each movement. In many cases, the players' basic posture will place the reception area between shoulder and knee. When they receive a spiked ball, they should not hit the ball above shoulder height as it may be outside the court. Receivers should keep low postures and always beware of spiked balls coming mainly below the shoulders.

c. Posture for spiked balls

As mentioned in the articles on underhand passes and fundamental postures, all players in the back court should keep stances as illustrated for quick reactions to fast spiked balls. Pay attention to arm and foot position. *(Fig 11-16, 11-17)*

d. How to anticipate the direction of the spiked ball

Distance from the net to set up: If the setter sets the ball far from the net, the spiker cannot make a hard, short spike in the attack area most of the time. *(Fig 11-18)*

Hitting position of spikers: If the spiker is not tall and if he is not good at jumping, or if he hits the ball above or behind his shoulder, he will not be able to hit a hard, short spike into the attack area.

Spikers Approach (in direction or steps)

The receiver can anticipate direction of the spike by observing spikers' direction or last two steps. *(Fig 11-D25, 11-D26, 11-D27, 11-D28, 11-D29)*
Changes of Hitting points

Attention to the arm swing of spikers: All spikers have their own special tendencies. The team coach must point out and explain the opponents’ habits to his receivers for future prediction of moves. (Fig 11-19)

Positions of blocker’s hands: All receivers decide their plan of action based on the position of blocker’s hands. They have to move between or outside blocker’s hands. (33.3% probability) (Fig 11-20)

Each team has its particular team formations for attack. The team coach should observe the opponents’ favorite attack formation so players can plan their formations to prevent opponents’ spike success.

e. Importance of Reaction in Spike Reception

Spiked ball speed is increasing especially in top class volleyball. Results of the Japanese Volleyball Association’s scientific research on speed of the powerful spiked ball are as follows:

Speed of spiked ball by top class players :

Men - approximately 27 m/sec (60.6 mph)
Women - approximately 18 m/sec (40.3 mph)

On the other hand, men’s and women’s reaction time, measured by sight, on single reaction methods were as follows:

Average men and women approximately .40 seconds)
Munich Olympic Gold Medalist (men) approximately .29 seconds
International 100 runners (men) — .25 seconds

If the ball flies 9 meters in the air from the top of the net to the floor at the same speed mentioned above, reaction time is .333 seconds for men and .50 seconds for women. (See page 150). But in actual game situations, spikers hit closer to the net and balls fly closer to the floor.

This data means that spiking must be performed at the limit of human ability and reaction time training to spiked balls is vital. A tip ball stays in the air approximately 1.20 seconds from the top of the net to the floor. A player can move 3.5 m within 1.20 seconds. Players must start 3 to 4 meters from the net (near the attack line) to receive a tip ball. This is why anticipation and reaction time are very important in reception play.
f. Direction of Reception Movements By One, Two and Three Players

As mentioned in underhand pass techniques, players should not move to the side but rather in a 45 degree diagonal direction when they return the ball to the setter as illustrated in the following diagram. (Fig 11-21)

When players receive a spiked ball by two players, anticipation of the next spike is essential for good formation play. Without anticipation, the reception will fail when the spiker tries a tip ball between the two players. The reception formations in the 6-player system is always anticipated by the players. At the same time, players should move in a 45 degree diagonal from each other and cross and cover each other as shown in the diagrams 11-D30 A, B, C, and 11-D31.

When three players receive a spiked ball, in diagram 11-D30C, player A moves for the tip ball reception or next set up, B moves behind C for coverage moving in a diagonal direction. This principle should be applied to all team reception formations even in the service reception formations.

When players master the fundamental spike reception techniques, the coach introduces variations on applied techniques (such as reception for unexpected ball rebounds) to cover adapting to all cases.
g. Net Play (Recovery From the Net)

There are differences in the type of rebound as shown in the diagrams II-D32, II-D33. The coach introduces net recovery training for game situations. Three factors which affect the ball coming off the net are as follows:

1) The speed of the ball as it travels into the net.
2) The part of the net it goes into.
3) The angle of the ball's deflection off the net and the direction of the ball's spin.

6. Service Reception

Service reception is principally the applied technique of the underhand pass. If a team misses the serve, the opponent team immediately scores one point as a result. It is essential to master the correct technique in service reception in developing a good team.

a. Coaching Process of Service Reception

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<tr>
<td>Service reception moving 45° diagonal directions (left, right)</td>
<td>Service reception returning the ball to a setter</td>
</tr>
<tr>
<td>Service reception by three players with penetrating setter</td>
<td>Service reception by two receivers</td>
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<tr>
<td>Service reception formation (W, M, roof and dish)</td>
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</tbody>
</table>
b. Technical Principles in Service Reception

The first service reception step is to move towards the ball and receive it directly in front of the body. The fundamental medium height position is as in Fig. 11-22.

The ball should not be received above waist height but if the player has no time to move laterally and to receive the ball directly in front, the reception can be done by moving the arms laterally as shown in Fig. 11-23.

The ball should be received between the knees in a low position and returned toward the setter.

The direction of the served ball changes suddenly close to the top of the net and at shoulder height of front-line players. Also, when a player receives a change-up service, he should not receive the ball stretching his body upward. Watch the ball carefully and face setter's direction before service reception.

c. Directions of Movement in Service Reception

These directions are important for service reception when the player wants to return the received ball to the setter. (Fig 11-24a, 11-24b, 11-D34, 11-D35, 11-D36, 11-D37)
7. Blocking

Blocking is a most effective counter attack in modern volleyball; it is not a defensive technique. The coach should give attention to improving fundamental techniques of blocking for success in the actual game. Even in blocking, there are many basic elements which players should master throughout the daily training.

a. Coaching Process of Blocking

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<td>Approach and jump moving back and forth</td>
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<tr>
<td>One man block to actual spike</td>
<td>Approach and jump moving parallel to the net in side-step, cross-step and dash</td>
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<tr>
<td>Prediction of spike course and timing</td>
<td>Prevention of wipe-off technique</td>
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<tr>
<td>Two man block and its axis for perfect blocking</td>
<td>Recovery and move to the position for next play</td>
</tr>
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b. Starting Position of Blockers for Opponent’s Attack

Front center player (FC) stays near the net, front left (FL) and front right (FR) stay behind the net, then FL moves for block against quick spike. (Fig 11-D38)

When all blockers stay near the net, there are no receivers for tip-ball and quick spike (Wrong position). (Fig 11-D39)
c. **Fundamental Postures for Blocker**

Hands beside ears; 90 degree angle at hips and legs; 100 to 110 degree angle at knees; 80 to 90 degree angle at ankles. (*Fig 11-25*)

d. **Height and necessary Conditions in Blocking**

Jump as high as possible and extend hands over the net at the following heights: (*Fig 11-26*)

*Men* — Elbow over the net
*Women* — Middle of arm between elbows and wrists over the net

Proper timing is a very important element in perfect blocking. If timing is poor, the ball will deflect away after the block. In badly timed jumps or bad posture, the ball will fall between the net and the body. Receiver in back court may not anticipate the path of the spiked ball and will be unable to receive the ball properly. Timing for the blocker will depend upon the jumping ability of the spiker, the force of the spiked ball and the distance of the set from the net.

e. **Movements and Footwork in Blocking**

Correct locus (path) of movement of center of body weight is OAB. OABC is an incorrect movement. (*Fig 11-27*)

Side-step near the net and braking foot position. (*Fig 11-28*)
Cross-step near the net - faster than side-stepping. (*Fig 11-D40*)

Dash facing side and braking position - No. 7 step: Braking foot position. (*Fig 11-D41*)

45 degree diagonal movement for prevention of wipe-off techniques. (*Fig 11-D42*) — No. 3,4 step: Braking position for prevention of wipe-off spike.
f. **Arm Motion in Blocking**

In final approach, blocker should face inside of court to prevent wipe-off spike.

After the opponent’s set-up, blocker should watch the approach of spiker and anticipate the direction of his spike.

Learn the technique of increasing the width of the blocked area by moving the hands along the net after anticipating the path of the spiked ball.

In final spiked ball contact, extend thumbs and little fingers. Wrist action should be added in returning the ball to the opponent’s court.

g. **Movement After Blocking**

When the block succeeds, look out for the next blocking attack.

When the block fails, land on the court facing the spiked ball for the next play as shown in the diagram below. When the ball passes between two blockers, they should face the spiked ball. Confirming the position of setter, they should move to correct positions for the next spike. Sometimes after blocking, they will have to move for net recovery and set up. *(Fig 11-29, 11-30)*

h. **Principle and Method of Blocking With More Than Two Players**

The blocker, staying close to spiker, should be the axis of blocking.

Hand B of outside blocker should be the axis (center) of two-man blocking. *(Fig 11-D43)*

Prediction of spike direction by player A was wrong Fig. 11-D44 and of player B in Fig. 11-D45.
When the ball passed between players A and B, player B should be responsible (wrong). (Fig 11-D46)

i. Judgment of Whether Or Not to Jump For the Blocker.

Judgment will depend on the following conditions of the opposing team:

- Distance of the set from the net
- Whether or not the spiker's approach is well timed
- Ability of spiker (can he hit spike hard or not).

References


Fig. 11-14
Fig. 11-23
Fig. 11-29