



Volleyball ACE™ Power Tips

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Movement Training for Blocking

By Josh Katz, M.Ed., C.S.C.S., ACSM H.F.I.

This article is going to take a different approach to blocking by not discussing option blocking or blocking evaluation. With the tempo of the game and the sets getting faster all the time, decision making strategy and mental conditioning outweigh physical movement in priority. In other words, if the blocker makes the incorrect read, no movement strategy, technique or speed will make up for this delay.

Previous articles have dealt with enhancing athletic performance (i.e., speed, agility, quickness and power) in a conditioning realm outside the actual performance of true volleyball-specific movement. Some articles have dealt with the actual patterns performed by the volleyball athlete.

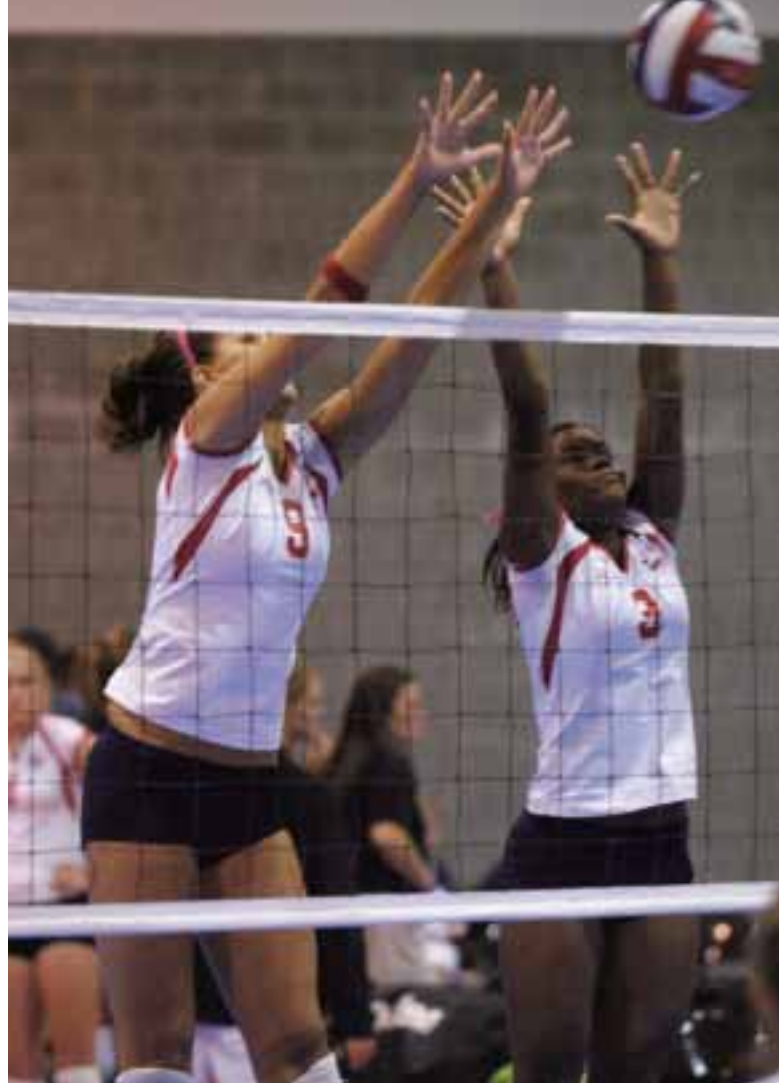
The problem with movement training in a strict “conditioning” sense is that it is limited in breadth and duration. In most cases, movement enhancement is conducted in the off-season, perhaps involving some “take-home” drills, and tapers off quite a bit as summer and pre-season approaches. This schedule excludes at least six months (roughly August through January for collegiate women), assuming a regular program is followed in the late spring and summer up until the pre-season. As a result, any movement skill is likely to erode if only performed for half the year.

Over the years, few articles have focused on how to connect movement enhancement with actual volleyball-related movement patterns. This article will provide some concepts that can be integrated into several blocking drills and should increase the effectiveness of the movement and allow for greater task-specific movement enhancement over a longer period of the training year.

It would not be an exaggeration to say that most successful teams block well. Because most offensive combinations are played with great speed, blockers are pressed to execute appropriate movements in a short period of time (Buekers, 1991). Blocking is dependent upon several factors, including anticipation, decision making, movement speed and jumping ability (Vint, 1996). The movement training tips and concepts explained here will focus on movement speed and jumping ability and, to a lesser extent, on decision making speed.

Little research is available on quantitative measurement of selected blocking footwork patterns and techniques. Vint reviewed three such techniques (slide step, crossover step and run-step technique) from work conducted by Buekers (Vint, 1996). The read and subsequent decision made by the middle blocker will determine the type of blocking pattern used. Let’s examine some me-

It would not be an exaggeration to say most successful volleyball teams block well. (Photo by Steve Markos/courtesy of USA Volleyball)



chanic issues related to those movements and how to improve the mechanics and enhance force output specific to those movements.

Movement Enhancement Key Point No. 1

Visually speaking, decision making speed is just one of the components that comprise the speed spectrum. As defined by functional anatomist Jurgen Weineck, speed is the ability to react to a stimulus in the least amount of time. A middle blocker must use *perceptual speed* in order to decipher and process the

key elements of the game – in this case, blocking. He must then use *anticipation speed* in order to be at the right place at the right time, with little wasted effort. An example of wasted effort is when the middle, while closing a block, gets caught leaning the opposite way due to a deceptive set. Finally, the middle must make fast judgments, using *decision making speed* that allows for the ability to make these fast decisions from a variety of options in the shortest amount of time.

The middle blocker then uses specific visual search patterns and appropriate movement patterns to follow (as outlined by Kluka and Planer, 1998). If the distance is short, a slide/shuffle step will suffice. From a movement perspective, this type of step is a quicker response to a fast movement and allows the player to remain square. Taking additional time to square up may cause a delay in the jump or impair the angle of the block.

Blocking: The Starting Position

Controversy exists as to the best starting position. Some coaches advocate a taller stance for readiness on the quick block, with hands and arms held high. From a movement perspective, since other potential movement options (cross or run step) exist, a starting position consisting of flexed hips (pre-jump base) and weight balanced (neutral) is recommended. Loading to one side would be okay if the blocker knows she will drive off the loaded leg going in the opposite direction. The problem is that the middle does not know which movement will occur, or in what direction. Therefore, if the middle blocker has to run step to the right and is loaded on the left leg, that load must be alleviated or shifted to the right in order to overcome initial inertia. If the

A blocker must use anticipation speed to be in the right place at the right time. (Photo by Steve Markos/courtesy of USA Volleyball)



CALENDAR

2008 AVP Crocs Tour Stops

May 24-26, Louisville, Ky.
 May 30-June 1, Atlanta, Ga.
 June 6-8, Hermosa Beach, Calif.
 June 20-22, Belmar, N.J.

June 20-21 FIVB World League Intercontinental Round
 USA vs. Bulgaria, Sears Centre Arena, Hoffman Estates, Ill.

June 27-28 FIVB World League Intercontinental Round
 USA vs. Finland, Resch Center, Green Bay, Wis.

2008 AVP Crocs Tour Stops

July 4-6, Boulder, Colo.
 July 11-13, Chicago, Ill.

July 11-12 FIVB World League Intercontinental Round
 USA vs. Spain, U.S. Cellular Coliseum, Bloomington, Ill.

July 23-27 2008 FIVB World League Final Round
 Rio de Janeiro, Brazil

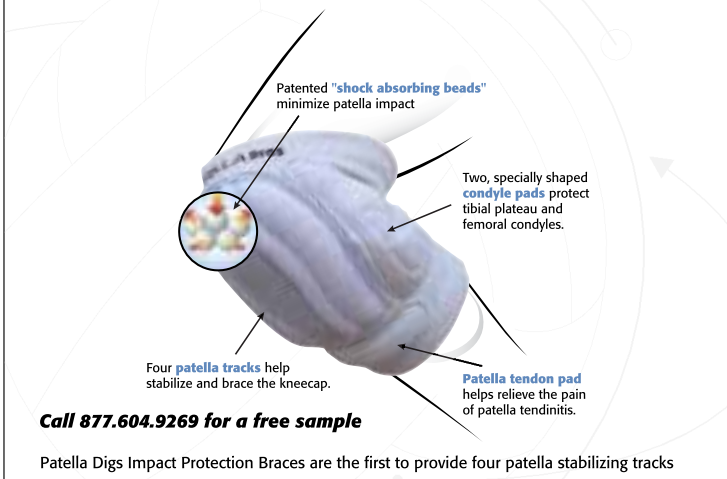
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middle is loaded on the right leg, the weight would have to be shifted left or neutral just to move! Therefore, the recommendation is to keep the load neutral, slightly wider than hip width, and slightly externally rotated. High arms and hands will not allow much of an upper body or countermovement and it will be more difficult to execute and cover much ground in a cross or run step. The recommendation is to keep the elbows slightly tucked, ready to assist in the cross or run step.

Blocking: Footwork Technique

Though the best footwork technique for the lateral movement sequence in volleyball blocking has not definitely been determined qualitatively or quantitatively, R.H. Cox (1980) did measure the slide step, crossover step and jab crossover step techniques. Using a pair of pressure-sensitive floor mats that were connected to a computer and a timing mechanism, participants were instructed to move laterally as quickly as possible from one mat to the next using a predetermined footwork technique. The average movement times for the slide, crossover step and jab crossover techniques were 1.284, 1.329 and 1.349 seconds, respectively.

Statistical analysis of the data confirmed that the slide step yielded significantly faster movement times than either the crossover or the jab crossover. In addition, it was concluded that the crossover step technique was faster than the jab crossover. Inexperience of the recreational participants, however, skewed the results somewhat (Vint, 1996).

In a 1980 study, Cox studied 42 competitive volleyball players. This time, the subjects were allowed to utilize a preferred step technique. The average movement times for the preferred, slide and crossover techniques were 1.306, 1.302 and 1.345 seconds, respectively. Cox (1980) concluded that both the preferred and slide techniques were significantly faster than the crossover technique. However, no difference existed between the preferred and the slide.

In an interesting observation, Cox (1980) reported that during the preferred trials, participants invariably used some combination of the prescribed techniques when performing the lateral movement. This study also included a vertical jump-and-reach at the conclusion of the lateral movement, a finishing movement that was not included in the first study (Vint, 1996).

In 1991, Buekers evaluated the fastest lateral movement and jumping times among 10 national-caliber female volleyball players. The running technique was found superior to either of the training methods. Buekers (1991) concluded that the optimal step technique should vary as a function of the lateral distance that must be traveled by the blocker. That is, for short distances, when lateral movement time is not the major concern, it was rec-

ommended that the slide step be used since it allows the blocker to maintain a more appropriate body position throughout the movement. However, when the blocker must travel quickly to the outside to assist with an outside attack, the running technique was advocated for its overall superiority in lateral movement, jump and reach time (Vint, 1996).

Movement Enhancement Key Point No. 2

Buekers' philosophy eloquently points out that decision and distance determine the appropriate movement pattern. The decision made by the middle from the setter's cues and pass will tell him how much of the net will have to be covered. The only real question remaining is which movement will be used to cover the outside quickly.

While coaches and athletes have their preferences, certain issues should be considered. Hip flexibility may determine the distance covered in a crossover movement, or torso length might have an effect on the movement. A middle with a short torso and long legs might have a longer "distance" for the torso to become aligned with his step. From a mechanics standpoint, the first word that should be put in its proper perspective is "step." This word implies the feet make the initial movement, when in fact the torso or hips are the first in the kinetic chain of command to employ movement.

Drive Step

The drive step is used to cover small distances that will require a quick jump, further requiring the athlete to be square to the net. Drive refers to the hard force application to the ground by the trail leg in a straight line. One tendency of players is to hop instead of drive. Hopping in-

creases air time and creates an arc in the movement. By hopping off both feet, force is actually negated by the lead leg that acts as an opposing force. The athlete should cue in to "quick flex and drive" off the trail leg. Two movements in most cases should not be needed.

Crossover Step

When initiating this movement, the biggest flaw is that very little distance is covered. In many cases, it is no more than a drive step. This flaw is caused by two factors:

- Immobile hips - tight hip flexors, adductors, iliotibial band and other muscles crossing the hip and knee joint will not allow the athlete to snap the hip forcefully or cross the mid-line covering significant distance.
- Torso alignment - just as a sprinter must be leaning forward to come out of the blocks, the middle performing a crossover step must lean in the desired direction.

The drive again comes from the trail leg. As the hip snaps across



Research has shown that during the attack, approximately 0.34 seconds elapse from the instant of takeoff until the instant of ball contact. (Photo courtesy of FIVB)

the midline, the hips rotate the torso and the torso ends up over the base (foot). The former lead leg now whips around to assist in squaring or in preparation for a finishing drive step, if necessary. Many coaches and players prefer to initiate with a drive step and convert into a crossover. The advantage to this technique is that it does create momentum for the crossover. On the other hand, if the crossover is performed with correct alignment, maximum force and distance, additional drive may not be necessary.

Run Step

Though it is necessary to “cover the quick,” many athletes try to remain upright as they reach the lead leg (leg closest to the desired direction). This stance prevents the lead foot from planting under the torso and making a forceful drive. The next or bigger mistake is leading with the heel. The heel is a brake that inhibits movement due to overstriding. Athletes and coaches must remember that the movement should occur in one segment (torso, hips and feet), not feet first, followed by hips and then torso. The solution is to get small! The middle should triple flex from hip, knee and ankle and initiate the drive with the lead leg becoming the drive leg as the torso shifts over the lead leg in a sprint-like position. The “cue” is to lean into the drive so that as the foot strikes the ground, the torso is directly over the lead foot, which again becomes the drive foot.

Vertical Jumping

Once the blocker has arrived at the final outside position, a vertical jump must still be completed. If the blocker is afforded the time (which is not always the case, particularly when the middle blocker is concerned), the vertical jump performance may be enhanced by rapidly squatting down prior to the propulsive phase of the jump.

This lowering sequence is called countermovement because it occurs in the direction that is counter or opposite to the direction of the desired movement. During the descent of the countermovement, the hips, knees and ankles are flexed into positions that stretch the muscles that will later act to extend those same joints during the upward phase of the jump. Research has suggested, in addition to improving the force producing capacities of the muscle itself, this pre-stretch mechanism improves jumping performance by utilizing some of the elastic properties of muscles and tendons.

With regard to the countermovement, it is important to understand the optimal depth and rate of the countermovement will probably be different for each athlete. Since athletes will have slightly different physiques and differences in muscular strength, each athlete should be encouraged to develop his own countermovement that results in the best individual jumping performance. Some athletes may develop a countermovement that does little to enhance their jumping ability by squatting too much, not enough, too slowly or too quickly. Too much depth in the countermovement can actually impair vertical jumping performance.

While you are probably more familiar with the athlete who employs too little of a countermovement, it has been shown that the other extreme also decreases performance. The rate at which the countermovement is performed (i.e., the speed at which the athlete squats down) will also influence jump height. The faster the countermovement, the higher the jump height. This result in itself provides firm evidence that under no circumstances should the athlete hold the countermovement in the lowered position for any significant length of time.

Movement Enhancement Key Point No. 3

From a movement training perspective, the depth of the countermovement is key to the individual blocker. When performing strength movements (double- or single-leg) such as hang/power cleans, hang/power snatches, high pulls and snatches, push press/power jerk and squats, train the athlete in a variety of depth, especially the depth the blocker exhibits most when performing various blocks.

The Importance of Being Early

Research has shown that during the attack, approximately 0.34 seconds elapse from the instant of takeoff until the instant of ball contact. Since the preparatory phase (rising into the air and cocking the arm) lasts about 0.29 seconds, only 0.05 seconds are needed to initiate the forward motion of the attack and to strike the ball (Chung, 1988). For a blocker, this finding has some important implications.

To get a feel for this time frame, try to start and stop a stopwatch as quickly as possible. You will probably find that you cannot come close to 0.05 seconds. When applied to the case of the blocker, it is clear that if the blocker has not scaled the net by the time the attacker has begun to accelerate his arm in the forward direction, the blocker will not have the time to penetrate the net before the ball has passed. The only way to make sure that the net is sealed, therefore, is to penetrate the net early, well before the attacker begins the forward arm swing (Vint, 1996).

Improving movement speed before the block is paramount to the success of the overall block. Speed training for volleyball has nothing to do with improving a 20-yard dash time or shuttle drill. When it comes to blocking, it is about improving speed in order to close the block!

Conclusion

Unfortunately, little research has been done on the biomechanics of blocking. As a result, it is somewhat difficult to make an informed, objective decision on the techniques that may optimize an athlete's blocking performance.

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VOLLEYBALL ACE™ DRILLS

Vision Reaction Time and Visualization Drill

Josh Katz, M.Ed., C.S.C.S., ACSM H.F. I

Number of Players: 2

Number of Balls: 0

Objective:

To improve the speed it takes to change a visual reaction into a movement response (i.e., you see the setter's hands and you move to block).

Directions:

1. Write out different two-digit numbers (1" high) on the first 10 of 60 3x5 cards.
2. Write three-digit numbers on the second 10 and follow with four-, five- and six-digit numbers on

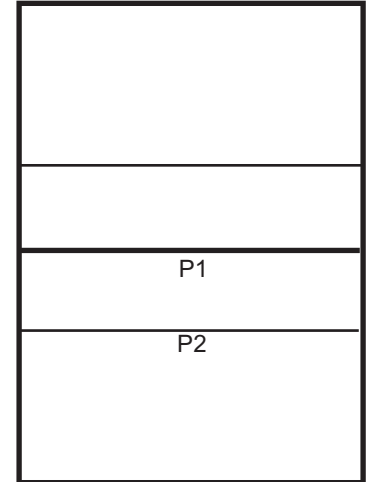
each successive set of 10 cards.

3. The player (P1) stands at the net, with a partner (P2) approximately 10 feet away.

4. P2 should flash the numbers quickly as the athlete calls out the numbers. Work for speed and accuracy.

Variation:

1. Have the numbers and positioning equate movement and direction. For example, in a series of four-digit numbers such as 3, 6, 8, 4, if a "4" is called by the partner, the athlete should move to the right with a cross or run step (in order to cover distance).



Let Go Series

Josh Katz, M.Ed., C.S.C.S., ACSM H.F. I

Number of Players: 2

Number of Balls: 0

Objective:

The following series is a great way to add a forceful step into a variety of blocking movements. They are best performed with a thick cloth belt with hooks on the front, back and sides, and a leash-like device for the initial overcoming of inertia (first step). A bungee cord attachment or newer device that utilizes a Velcro® rip cord can provide slight resistance at various phases of movement. These adjunct devices are more appropriate for off-

season training. The leash-like device can actually be used in pre-season and in-season blocking drills.

Directions For Series:

1. **Let Go and Slide:** Partner holds the leash as the blocker begins in a normal blocking position, flexes and pushes aggressively off the trail leg for one drive step laterally. Before the second step, the partner lets go of the leash, causing a thrust (neuromuscular response to additional resistance) in the second drive step. The blocker moves right into the block with no hesitation.

2. **Let Go and Crossover:** This one uses the same starting position as the previous drill. The blocker jabs with the lead leg,

shifts the torso toward the direction of movement and aggressively drives the trail leg across the midline. The partner releases the leash just as the blocker's movement begins.

3. **Let Go and Run Step:** This drill uses the same starting position as the previous ones. The blocker externally rotates the "lead" side of the hip, which opens like a hinge. At the moment of movement, the leash is released as the torso of the blocker leans simultaneously into the step with the lead foot. The lead leg now becomes the drive leg and another forceful step occurs. The let-go effect can also be delayed until this thrust, as the person holding the leash would simply follow along the movement with slack in the leash.

Read Blocking

From *101 Winning Volleyball Drills From the AVCA* (2000)

Number of Players: 6

Number of Balls: 6

Objective:

To provide opportunities to work on read blocking.

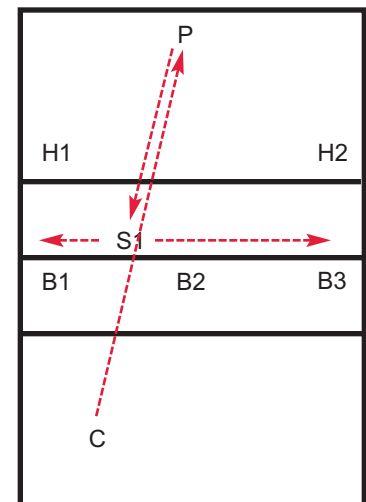
Directions:

1. The coach (C) puts the ball in play.
2. One player (P) passes the ball to the setter (S).
3. Setter (S) sets the ball to the outside hitters (H) using a variety of sets (e.g., 4 or 5 set, "d" set, back-row set).
4. Blockers (B) read the setter and block to the

ball. Two or three blockers should be on the ball, depending on where the set goes.

5. Blockers must block a certain number of balls (3, 5, 7 or 10) to the floor to get out of the drill.

6. Offensive players work on coverage.



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