



## USA Volleyball Injury Prevention through Proper Reaction, Reading and Anticipation

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*Volleyball is a unique sport in that it's both cyclic and acyclic in nature. Skills such as digging are totally random movements (acyclic). The player must instantly react and dive for the ball based on its flight path. Skills, such as spiking, are patterned (cyclic) movements. The approach, jump and spike is repeated as a pattern with consistent contact for the kill as the prime objective. These two types of movements offer unique challenges in the prevention of injury to the volleyball player. Traditional injury prevention methods emphasize the strengthening of muscles in general, and the tendons and ligaments surrounding joints through progressive overload. But being out of position in performing patterned movement skills can create stress on the body which can cause injuries both acute and chronic, which all the strength and conditioning in the world may not be able to prevent. The author explores this little-attended fact to bring attention to how good reading, anticipation and reaction skills can lead not only to top level performance but prevent injury as well.*

**– Ken Kontor, Performance & Conditioning for Volleyball Editor**

Not enough coaches pay attention to the judgment skills of volleyball; anticipation, reading and reacting to the flow of the ball. Coaches work endlessly on technique, such as how to do a roll to get to the ball, while the real problem is that the athlete can't get to the ball because they can't anticipate where the ball is going to be. This carries over to every skill in the sport of volleyball.

Volleyball happens fast. There isn't a lot of time to think about what's going on as the ball flies around the court. What this translates into is that this situation can cause injury. There are steps in teaching kids to learn how to judge. You can help guide their progress through the whole game to be safer in contacting the ball, training them when they misjudge the ball as to what they need to do to avoid problems which includes not hitting the ball.

### **Beginning Considerations in Teaching the Spike**

What we do in this country is teach the spike near the net, then tell the athlete for the rest of their lives to stay off the net and not touch it. What we should do is teach three meter line attacks, which is spiking the ball over the net with a lot of distance to the net. This creates more of an area of judgment by the hitter and more room for an error to be put hit over the net. You'll also see with the novice players that the sets of the ball are more random. By setting off the net you can hit the ball more safely. As the players gain better anticipation as well as technique you can start to put the ball closer to the net. It's easier to time a lower set than a higher set. Rather than starting out with high ball, a young player should be taught with one or two meter sets. These are easier to time because they are coming down through the hitting zone slower and gives the hitter more time.

If an athlete has poor technique in hitting the ball, they don't hit with full extension but down by the ear with a bent elbow. The old style negative coach would say, "Don't drop your elbow." The new thinking positive coach would say, "Keep your elbow up, reach or extend to get on top of the ball." Both are not optimal.

We ask players to show the skill without the ball first, where timing isn't involved. If the player shows that they can spike with full extension without the ball and it looks solid, they know the technique, just not the timing and judgment parts. All the errors will come in anticipation, judgment and timing. In the above example, an athlete that is hitting down by the ear should be told to swing sooner or faster.

## How Injury Occurs

In spiking, a classic example of poor judgment is under running the ball. In volleyball, the spike, the most powerful moment in the sport, comes when you are unsupported in the air. This is different than most sports. If it were baseball it would be like leaping up in the air before swinging at the pitch. It is tough. The player has to rely on a teammate to deliver the ball to a position at the net that is consistent. In the real world this doesn't happen. These are open motor programs, not the closed programs that you see in gymnastics. If a player under runs the ball they know that they can't hit the ball with power when the ball is behind their head. So, they lean back to put the ball in front of their shoulder. This puts huge stress on the lower back and causes injury if done repeatedly over time.

In the case of the knee injury, what happens invariably is that a right hand hitter will have a left knee injury. Because the ball drifts past their shoulder to their left side, they know they are supposed to hit it. They put their body in such a position that the ball is in front of their shoulder and hit it. The problem is that they land on one leg over the left knee. All the force that results from this totally imbalanced position comes down on that knee.

These kids think that they are in the right place. We know they are not. One solution is to video tape them and show their positioning. When the athlete gets into position to spike they should be taught to say, "yes or no". Yes, it's right or no, it's not right (the position). If they under run the ball and still say "yes" they are in the right spot, their kinesthetic awareness is wrong. The coach may find themselves having to retrain this awareness to get into the proper position. This may mean that the coach will have to exaggerate jumping in a different place or keeping the ball way out in front or behind depending on the skill.

In game situations if the ball is served and the player can't read the ball, move to it and judge the ball, they are going to have a huge gap in making a good mental decision. They have a choice of using good technique but the ball will be to one side, resulting in totally whiffing the ball or, they have the choice to reach out to the side, extend totally out of line, and from a technique point of view hit the ball way out of position. But, they are touching the ball and delivering it to the right spot.

Going back to hitting the ball down by the ear. If they were to reach to get on top of the ball at the same moment in time so there is full extension, the ball would hit them on the elbow. They know this is something that they aren't support to do, so what happens is they put their hand on the ball and drop their elbow lower.

If you are going to err, teach the kid to err with the ball in front. Unlike bad positioning off to the side or in back, with the ball in front the player still has the ability to hit with a lot of power. If the ball is in front the player will also land on both feet, which is a very safe position, rather than an imbalanced one leg landing. Part of the "secret" to doing this is to start every hitting training segment with 3 meter line attacks, and progress towards the net, rather than the traditional start at the net and coach's begging for the players to stay off the net...

As the athlete gains strength from off-court strength training the chance of knee injuries occurring from single leg landings are diminished. You see the big swing hitters consistently land on one leg. As in plyometric training you don't start by jumping off a five foot box or bounding on one leg. You progress as the body gains strength and joint integrity. The player learns what their body will take and establishes their own personal limits. This happens over time.

## Teaching the Techniques through Progression and Overload

The key to proper hitting is doing it off of live sets, making things as game-like as possible. The high outside sets are the ones that offer the most chance for misjudgment. The way to progress and overload this skill is to start on a small court (four meter) near the net, with light jumping as you teach the athlete with bump sets 1v1 and 2v2 inside the three meter line. The players start by learning

control, since everything over four meters is out of bounds. The player can't hit with full power. But, with each set the player is learning to anticipate, judge the ball and time their jump. You then start to expand it by putting the sets up higher. In this case, now that you are hitting over the whole court, you want to be hitting off the net. You then start setting the ball higher, and with more speed. This moves timing and judgment up a notch. The coach should make sure the player is jumping at the right time and place based on the set.

### **Teaching Non-dominant Hand Skills to Prevent Injury**

Sometimes being out of position on the hit is unavoidable. Playing at game action speed, the player in the heat of competition may not pull the plug on a hit. Because these situations occur, a practice that I recommend to create a more balanced, less injury prone volleyball player is non-dominant hand play. Do this as part of a daily warm-up. Practice non-dominant hand skills and build into playing with the non-dominant hand. If you play five minutes 1v1 warm-up, take one minute out and play with the non-dominant hand (even serves). If a player has as an option to hit a ball with their non-dominant hand, it's understood that the player isn't going to "dust" the ball but get it over the net successfully. The player can choose in the air, "hey, there's no way I'm going to make the play with my dominant arm" so they choose to get it over with the other arm. They can land in a more balanced position, not stressing the knee and back and still make a play. For me, I learned this when I broke my hand. I had to play an entire summer with my right (non-dominant hand). It got me to realize what balance was all about.

### **Stretch with Caution**

Too many people think that flexibility is something that should be done for their joints, when in fact flexibility is something done for the muscles. You don't want a flexible, unstable joint. Strength/stability training is done for strong joints. A classic example is the hurdler stretch. It still is practiced today. With the foot flared out the stress on the knee joint is great. You are compromising the integrity of knee joint stability by doing this. To do it right the toe should be curled under the foot so that the muscles of the thigh are stretched. Another common practice is walking on the outside and inside of the feet to prevent ankle injury. This, in my opinion, leads to ankle joint instability, but I was told this was a form of stretching.

### **Value of Small Sided Play**

Getting into shape to play the game is important. But, learning to properly judge and read the ball with the net is equally if not more important. Play small sided games, 1v1, 2v2 or 1v2. These are great ways to maximum the coach's time in teaching these skills in game action speed situations. One variation is to do a warm-up 1v1. Set the ball and do a quick push up. After the next set do a quick 360 turn, etc. What this does is shorten the amount of time you have to read the ball and adds more of a random factor. You will be a better player if you play doubles. When there are just two players covering the court you have to move, read and react more to the ball. On the outside of the net it reduces the information the player has to worry about since there are only two people on the other side. You learn to be a skilled, compact, quicker player and touch the ball every other time. The players know this value of small sided games better than the coach, as every time the coach calls the end to the game/drill of Monarch (King/Queen) of the Court, the players cry out "Nooooooooo!"

In practice you want to have more nets up to take full advantage of small sided play. If possible, you can improve the reading skill speed of the female players by playing coed 2v2, 3v3 and 4v4 situations or play in situations in which opponents are clearly better skilled (older or different age groups). This will also "overload" reading and hitting skills. You have on average only four to six hours a week to be in the gym working on the net. It's important for the coach to maximize the time they have with the net. Use it for warm up, and for all the drills/games you create.

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