ACL INJURY REHABILITATION

Seven Things Volleyball Coaches Should Know About ACL Injury Rehabilitation

Katie Reisbig Cordery, PT, DPT

Katie is a physical therapist and owner of Omaha Physical Therapy Institute, P.C. She runs a sport-specific program that addresses ACL injury rehabilitation called “Back in the Game.” Katie has been an athlete most of her life and has experience as a Division I soccer player. Katie has been involved in coaching youth soccer and basketball, Special Olympics, and organizing community camps for kids with disabilities. She has been a member of the American Physical Therapy Association’s pediatric and orthopedic specialty sections since 2002.

Katie had many injuries throughout her career and underwent reconstructive knee surgery twice. She knows exactly what it takes to get back into the game safely and with confidence. She graduated with honors from Creighton University with a Doctor of Physical Therapy degree. She has presented to many professional organizations including the American Physical Therapy Association Combined Sections Meeting. [Ed.]

The post-operative rehabilitation for ACL reconstruction surgery is a long journey for any athlete. Many factors will dictate how quick and safe an athlete is able to return to his/her sport. An athlete that has a strong work ethic and a sound strength and conditioning history will have a head start on the recovery process. Ultimately, the speed of progression is determined by one’s orthopedic surgeon and physical therapist who have extensive knowledge on the body’s physiological healing process. The road to returning to the volleyball court will be highlighted by small victories during different phases of the rehab process such as walking without crutches, jogging, and hopping. However, getting back to the game with confidence will be measured by one’s ability to dig, slide, jump, and block without fear. But there are more objective ways to measure one’s progress. If an athlete has participated in comprehensive strength, speed, and agility testing, they have objective data with which to compare. Specific to the volleyball realm is the three step approach vertical jump which is a skill that is required throughout different situations on the court. If a player is able to meet or beat the pre-injury height, it may give them the boost of confidence to play without fear and realize they are back in the game.

What Coaches Should Know #1: ACL Injury Prevention vs. Injury Reduction

The ACL has many functions for the knee joint, which make it vulnerable to injury as it is used to stabilize the knee during several different motions. The knee joint has mechanoreceptors (movement detectors) that tell the brain where and how the joint is moving. The brain in turn responds with contracting different muscles around the joint to help protect and stabilize. If the brain does not respond to a sudden movement quickly enough, the muscles do not stabilize and the joint relies on its ligaments for support. During these delayed responses, the ACL can experience injury.

In recent years, there has been a large emphasis on preventing ACL injuries through specific “ACL Prevention Programs.” These programs support the theory that with proprioceptive training, strength training, flexibility, and instruction on proper landing tech-
activities based on an athlete’s pain level and tolerance to the activities. I have found that during this phase, many well-conditioned athletes can experience minimal to no discomfort in the knee. They may not experience pain with certain activities that could actually stretch or injure the new ACL. As a coach, clear all activities with the physical therapist or surgeon to make sure everyone is on the same page, therefore allowing the most safe and efficient rehabilitation for the athlete.

Whenever possible, I attend a workout session the athlete has with their strength coach to witness the types of movements he/she is engaging in with an upper body and core workout. I discuss the surgeon’s protocol and healing process with the strength coach to allow them to maximize an athlete’s potential in the weight room during different phases of rehabilitation in a safe manner. I also communicate with the athletic trainer at the athlete’s school. The trainer is given a copy of the surgeon’s protocol for the rehabilitation and therefore is able to supervise the athlete while he/she performs the home exercise program for physical therapy.

What Coaches Should Know #3: Rehabilitation Process Protective and Functional Phase

From weeks 6-12, emphasis is placed on improving muscular control, proprioception and general strength. Exercises are progressed from static to dynamic with the introduction of plyometrics, jogging, and volleyball specific skill progression. During this phase, athletes may feel a boost of confidence with re-introduction of the previously mentioned skills. At this point, agility drills involving cutting, lateral stress, and sprinting are still contraindicated.

Physiologically, the new ACL is at its weakest point making it vulnerable to stretching and damage with certain movements. It needs to establish its own blood supply during this time so it is able to maintain health and strength to be effective in stabilizing the knee. This phase is usually the most frustrating for athletes and coaches because the athletes are feeling stronger but must hold back on progressing too quickly with strength and agility activities in order to allow the new ACL to heal appropriately.

The coach’s role during this phase is continuing to support the athletes psychologically as well as make sure they continue to work on upper body and core strength in a safe and appropriate manner. The physical therapist and strength coach should continue to keep in close communication regarding appropriate progression.

What Coaches Should Know #4: Bridging the Rehabilitation Gap

The next phase of rehabilitation is from 12-16 weeks. This phase involves the gradual re-introduction of sport-specific exercises focused on improving agility, reaction times, strength and endurance. At this point in rehabilitation, some surgeons will require athletes to be fitted and wear a customized supportive sports brace.

Many times at this point, athletes have to stop physical therapy—not because they do not need it anymore, but because insurance companies limit the window of time or the number of visits one is allowed for the year. After 10 to 12 weeks of physical therapy, a non-athlete patient has received enough rehabilitation to function in normal daily activities. In the case of athletes, it is unfortunate because the length of time required for a new ACL and the supportive structures around the knee joint to become strong and balanced enough for return to athletics is around 24-36 weeks. Technically, physical therapy should last at least 16-24 weeks. If therapy is terminated around 10-12 weeks, a gap of 6-8 weeks is created between outpatient physical therapy and return to sport activities. At that point, athletes and coaches are left with the question, “Now what should I do?”

For this reason I’ve developed a program that bridges this gap. Table One presents the program, “Back in the Game.” “Back in the Game” is run by licensed physical therapists who have training in sport-specific rehabilitation. It incorporates sport-specific drills and movement patterns, higher level strengthening, proprioceptive training, and agility and plyometrics to allow athletes a safe return to the game, thus reducing the risk of re-injury. Depending on the orthopedic surgeon, athletes may have to wear the supportive sports brace during the program and upon return to the sport. If the “Back in the Game” program is beyond the financial means of an athlete, then the coach’s role can become vital. Here, communication between player, coach and physical therapist needs to be frequent with specific instructions on precautions and appropriate progression. Ideally, during volleyball practice, the injured player can be performing individual activities such as figure eights, cutting, ladder, shuttles, spiking, and fast footwork sequences. It may not be the best circumstance but it is something coaches should be prepared to deal with.

Another resource to assist with bridging the gap is use of the athletic trainer at the athletes’ school. These trainers are an excellent on-site resource for coaches to tap into in this situation. Most athletic trainers are familiar with ACL reconstruction post-operative rehabilitation protocols and have had experience working with ACL injuries.

What Coaches Should Know #5: Integrating Athletes into Practice

Clearance to get back into practice and games is dictated by the orthopedic surgeon. Some orthopedic surgeons will want a bilateral strength comparison through isokinetic testing, typically requiring >80% strength in the injured leg versus non-injured leg before permission is granted to return to play. In addition, hop tests are requested by the orthopedic surgeon as are comparing sides. As a physical therapist, I look at an athlete’s reaction times—how succinct is the lateral cutting, how confident does one look going in for digs, how comfortable are they with sprinting, and how is the landing technique with jumping? Once a patient is cleared by the orthopedic surgeon and is confident with his/her agility, speed, endurance, and game skills, the player is ready to be integrated into practice.

At the point of reintegration, coaches need to be very aware of the status of returning players both physically and psychologically. Coaches and players need to realize that just because the orthopedic surgeon has cleared a player to return to practices and games, does not mean that the recovery is over for that player. A player will not be back to 100% right away. At first an athlete may go five minutes in a drill as hard as possible and then rest before doing another five minutes. This is done to see how the knee reacts to high intensity activity as well as avoid fatigue related issues and injuries. I do not recommend telling a player to go less than 100% of full speed to gradually get back into practice. First of all, how does one measure 50% or 75% intensity? Also, not allowing full speed creates hesitancy, which can set a player up for injury. This hesitancy can also make a player feel as if skills have been lost, which can hinder morale and transition back to the game. The players need to feel confident in order to find success upon return to volleyball.

Coaches need to communicate closely with the players, making sure they are wearing the sports brace if required, and encouraging them to continue volleyball-related conditioning outside of practice, both in regard to skills and endurance. Most players will come back feeling they are out of shape. Many times returning players will not convey to the coach if something is uncomfortable or that they are fatigued for fear of having to sit out of the sport longer.

Injuries can occur as a result of fatigue. To be effective, coaches need to be assertive with the players and ask questions directly relating to discomfort and fatigue to make sure the players are not playing through pain. For the best outcomes, players need to realize that being honest about their return to the court (both physically and psychologically) is needed to optimize their full recovery.
From personal experience, I was one of those players who returned to play rather quickly after my ACL injury. I didn’t have the confidence I needed to go in at 100% for tackles. I could not go up for a header in soccer without thinking about re-injuring my knee. I knew I just was not as fast as I used to be. My morale was down. It was my coaches and teammates who contributed to my motivation and understanding that my rehab was not over simply because I was allowed to play. I would not be done recovering until I reached 100% of my pre-injury level.

**What Coaches Should Know #6: Using Field Tests**

One important thing coaches can do on a yearly or season-al basis is collect performance testing data on each of their athletes. Not only is this information useful in evaluating the effectiveness of an athlete’s training, but also becomes invaluable in the rehabilitation process in case of the unfortunate event that an ACL injury does occur.

One test I recommend specifically for volleyball is the Mini T-test (see Figure 1). This encompasses forward and backward sprinting, and lateral shuffling and cutting in all one test. Furthermore, single limb hop tests, single limb vertical jump tests, and the three step approach vertical jump, are also beneficial to have on record. This data can provide athletes with another way to measure progress after an injury has occurred and can reinforce confidence that they are back to 100%.

**What Coaches Should Know #7: Role of the Brace**

After ACL reconstruction surgery, many orthopedic surgeons require their athletes to wear a supportive sport brace upon return to high-level activity and sports-related activities. One of the biggest issues athletes face upon return to their sport is the fear that they will re-injure the knee. The brace is an effective intervention in allowing athletes the confidence to try new movements and skills without the worry of re-injuring the knee. Volleyball players can dive, cut, jump, and sprint, mentally secure with the brace on. Most of the time, surgeons have a certain protocol with regard to how long the brace needs to be worn. This protocol needs to be followed by the players and reinforced by coaches. Some athletes may wear a brace for the rest of a career while others may get to the point where they feel confident psychologically and physically and are able to maximize function and skill on the field without it. Many athletes will declare themselves “back to normal” once the brace is no longer worn.

**More Information Please!**

Contact Katie at kcordery78@yahoo.com or go to her website at www.omahapti.com

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**TABLE ONE**

**BACK IN THE GAME**

“Back in the Game” is a five-week intensive sports rehabilitation program that bridges the gap between outpatient sport injury physical therapy and return to competitive sport activities. Back in the Game includes:

- Pre-program and post-program testing for agility, jumping, and speed
- Fundamental skills retraining
- Proprioception/kinesthesia to improve overall body awareness
- Sport-specific drills and activities
- Speed, power, and agility training
- Advanced strengthening

“Back in the Game” is run by licensed physical therapists who have training in sport-specific rehabilitation. Physician approval is required for post-surgical participants. Some insurance companies will pay for this program; otherwise there is a private pay option.

**Pre-testing/Post-testing:**

- T-test: 30 feet to cone, 15 feet to each side
- Mini T-test: 10 feet to cone, 5 feet to each side
- Single limb hop
- Single limb triple hop
- Single limb triple crossover hop
- Vertical jump

*Testing bilaterally on jumping for comparison of injured vs. uninjured limb*

**FIGURE ONE**

Activity: Mini T-test
- Athlete at start line sprints 10 yards to first cone and touches cone; laterally shuffles 5 yards to second cone and touches cone; shuffles 10 yards to third cone and touches cone; shuffles 5 yards back to the first cone and back peddals to the start line.
- Rest five minutes or until fully recovered and repeat.
- Record the better of the two times.