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## **Volleyball Injuries**

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It is estimated that 800 million people in about 130 countries play volleyball.<sup>1</sup> The majority of volleyball injuries come from overuse and account for between 50-80% of all injuries.<sup>2,3</sup> Most injuries are not season-ending or career-ending: most injured players miss four days or less of play.<sup>4</sup>

Blocking, followed by spiking, accounts for the highest rate of injury. Defense maneuvers (e.g., serving, passing and setting) account for a smaller number.

Sixty-three percent of injuries are related to jumping. The playing surface clearly impacts injury rates. Injuries are more common on concrete or linoleum than on wood or sand courts. It's a telling fact that elite collegiate players had five times as many injuries (per hour) when they played on indoor courts versus sand courts.<sup>5</sup>

The following are some statistics regarding body area injured, type of injuries, and recommendations for either management or prevention strategies:

- Ankle injuries account for 15-60% of acute injuries. The most common mechanism is forced supination, which occurs when a blocking player's foot lands on the opponent spiker's foot that has crossed the net line (in the "conflict zone"). Management should include icing, ankle manipulation (if fracture is not present) and rehabilitation, including proprioceptive training. An ankle orthosis or taping may assist in active rehabilitation.

Prevention is possible through a training program that emphasizes avoidance of the center line during practice and teaches players who jump forward when spiking to take longer steps prior to jumping and to jump straight up rather than forward. A study in Norway demonstrated a 50% decrease in ankle sprains with this training strategy.<sup>6</sup>

- Thumb or finger sprains account for approximately 10% of acute injuries. Radial collateral ligament sprain of the thumb metacarpophalangeal joint is the most common volleyball-related hand injury, and is often the result of blocking.<sup>7</sup> Thumb spica taping is helpful in returning the athlete to play. Finger sprains and closed fractures are usually managed by buddy-taping or splinting, respectively.
- Knee sprains or meniscus tears account for approximately 15% of acute injuries. Anterior cruciate ligament tears usually occur as non-contact injuries when the player lands with the knee hyperextended.
- Toes - "Sand toe" is a term coined by those who manage elite players to describe a forced plantar flexion injury occurring when the player rolls over the toes caught in the sand. The injury is likely a capsular sprain. This reverse version of turf toe is manageable with stabilizing and protective taping.
- Patellar tendonitis (jumper's knee) accounts for up to 80% of overuse injuries. Elite players spend much of their training practicing jumping. Plyometrics are often incorporated as part of the training approach in an effort to increase vertical jump. Plyometrics performed correctly are not a concern, however, unsupervised training may be a cause.

Patellar tendonitis increases with more time spent playing and is found more in the highest vertical jumpers. Pain is often at the bottom of the patella. Conservative management includes hamstring and quadriceps stretching. Decreasing jump training may also help. Those players with increased external tibial torsion and deep knee flexion at takeoff are at higher risk.<sup>8</sup>

- Shoulder tendonitis/impingement/suprascapular nerve entrapment account for 8-20% of overuse injuries. Overhead movements such as overhead serving and spiking may increase risk of impingement. The increased force occurring at ball contact while the arm is in maximal abduction may increase the risk of impingement. Many players will have loose shoulders on load-and-shift testing. Scapular stabilization exercises followed by glenohumeral rehabilitation (rotator cuff) are important to prevent impingement.

Up to 32% of players have suprascapular nerve compression. This usually occurs at the spinoglenoid notch (entirely motor at this point). The result is infraspinatus atrophy. The mechanism is particularly associated with the "floater" serve, which involves conveying as little spin as possible to the ball, making passing difficult. This injury probably results because the server purposely stops the follow-through immediately after striking the ball. This retracting of the arm requires forceful eccentric contraction of the infraspinatus.

Suprascapular neuropathy is often painless due to involvement of the motor portion to the infraspinatus only. Pain may result from imbalance in rotator cuff stabilization. Sixty-seven percent of individuals have a ganglion cyst compressing the nerve; therefore, MRI evaluation is recommended. Surgery may benefit if initiated early, however, most elite players with suprascapular impingement with infraspinatus atrophy play with no decrease in performance. Focus on shoulder external rotation strengthening may help.

- Low back overuse accounts for approximately 10-14% of injuries. Hyperextension on serving or spiking may predispose the individual to facet injury.

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