TRAIN
KLEINHENZ

Understanding Common Musculoskeletal Injuries in High-School Female Volleyball Athletes & Treatment/Prevention

Madison Kleinhenz
M.S., CSCS, Cf-L1
@coachkleinhenz
E-mail: train@madisonkleinhenz.com

Review of Literature

Please note: All of the studies mentioned in this presentation consist of populations ranging from middle school to collegiate and professional female volleyball players. The aim is to be as intrinsically appropriate as possible.

- Rates of Injury Type from Highest to Lowest %: **Knee (33%) > Ankle (17%) ≥ Shoulder (17%).**
- LH,RH sustained highest reported frequency of ankle sprains and shoulder overuse.
- Patellar Tendinopathy “Jumper’s Knee” correlates with higher rate of time-loss (athlete unable to play).

TRAIN
KLEINHENZ

Most Common Injuries

Patellar Tendinopathy - “Jumper’s Knee” ● Acute Ankle Sprains ● Shoulder Tendinitis & Impingements

TRAIN
KLEINHENZ

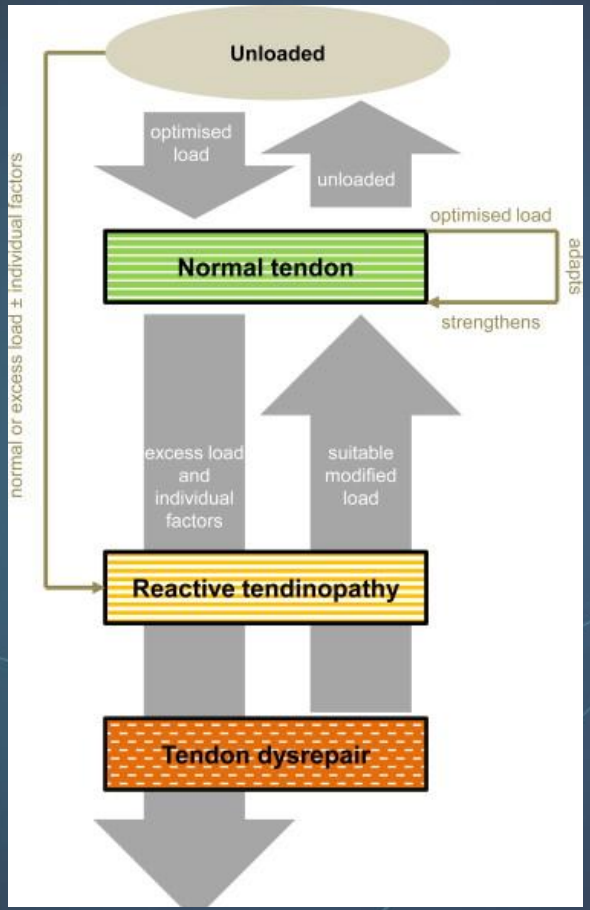
Patellar Tendinopathy

Patellar Tendinopathy or “Jumper’s Knee” is often considered an overuse injury in which the tendon is aggravated by loading in knee extension.

Proper reduction of training volume and/or intensity can create a modified load so that an athlete can continue to participate in sport (as seen in the graphic on the right).

Physical Therapy can be beneficial in conservatively managing athlete pain.

*Please note: If not treated/addressed, reactive tendinopathy (acute) can become degenerative.



Best Practices

1. Patellar Tendinopathy

- Ensure athlete has been cleared for Return-to-Practice/Play by medical professional.
- Follow guidelines/contraindications per medical staff parameters.
- Ensure athlete has proper quadriceps stretching along with core and knee extensor warm-ups.
- Encourage S&C of **jumping and squatting mechanics, eccentric training around knee, increased posterior chain strengthening and core development.**
- Provide progressive intensity (practice versus competition) with athlete feedback.

Acute Ankle Sprains

Any acute injury should immediately be assessed by medical staff (ATC, PT, Team Doctor).

Acute ankle sprains can occur through inversion or eversion of the foot to a degree that is abnormal to the ankle. (Image on Right)

Ankle sprains are the most common acute injury and can occur both in contact and non-contact.

Recurrent sprains may be less likely to occur if ankle tape or orthosis is worn (by medical staff recommendation).

Point(s) of injury in an inversion ankle sprain can be any or all of the lateral ligaments (outside of ankle).

Best Practices

2. Acute Ankle Sprains

- Ensure athlete has been cleared for Return-to-Practice/Play by medical professional.
- Follow guidelines/contraindications per medical staff parameters.
- Ensure athlete has **proper footwear** during training and conditioning.
- Encourage S&C in regards to **plyometric progressions and landing mechanics.**
- Provide progressive intensity with jumping (practice versus competition).
- Consider rehab by AT/PT as needed to avoid reliance on external bracing.

TRAIN
KLEINHENZ

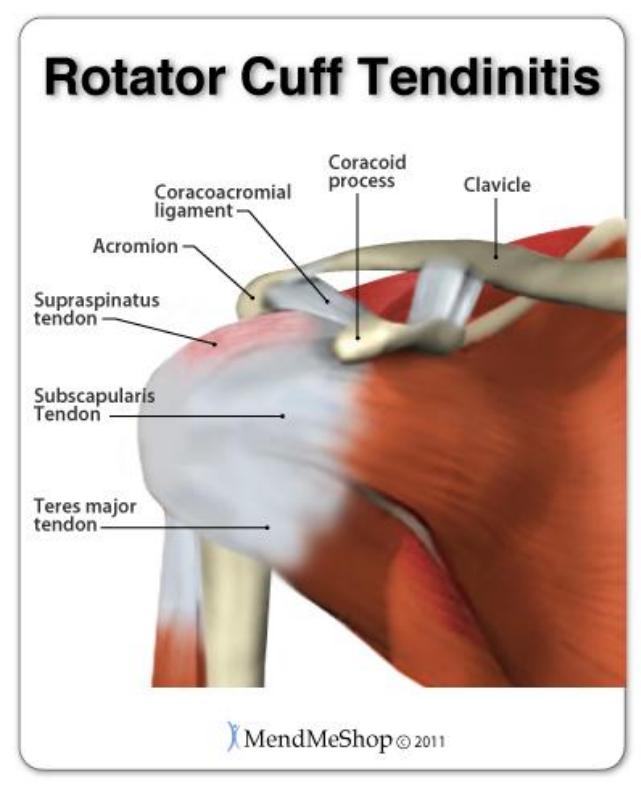
Shoulder Tendinitis & Impingements

*Overuse Injuries often due to overhead movements like the spike and serve. (LH, RH at highest risk of overuse)

These are primarily non-contact injuries and often linger for longer periods of time.

Impingement can also occur at the glenohumeral joint and can affect overhead hitting performance and internal rotation.

“Shoulder” pain can be caused by many conditions including rotator cuff tendinopathy or labral issues and should be addressed by medical professionals (ATC, PT, Team Doctor) because like patellar tendinopathy, it can become degenerative.



Best Practices

3. Shoulder Tendinopathy & Impingements

- Ensure athlete has been cleared for Return-to-Practice/Play by medical professional and adhere to established parameters.
- Y,W,T warm-ups and low-intensity stretching for shoulder girdle can help in prevention.
- Encourage S&C in regards to strengthening shoulder girdle and posterior rotator cuff musculature.
- Monitor overhead movement to ensure contact remains <250 hits/week. (Serving & spiking).

TRAIN
KLEINHENZ

References:

1. Frisch K., Clark J., et al. High prevalence of non-traumatic shoulder pain in a regional sample of female high school volleyball athletes. *Orthopaedic Journal of Sports Medicine.* 2017; 5(6). doi: 10.1177/2325967117712236

1. Reeser J., Gregory A., et al. A comparison of women's collegiate and girls' high school volleyball injury data collected prospectively over a 4-year period. *Sports Health.* 2015; 7 (6): 504-510. doi: 10.1177/1941738115600143

1. Kilic O., Maas M., et al. Incidence, aetiology and prevention of musculoskeletal injuries in volleyball: A systematic review of the literature. *European Journal of Sports Science.* 2017; 17(6): 765-793. doi:17461391.2017.1306114

1. Seminati E., Marzari A., et al. Shoulder 3D range of motion and humerus rotation in two volleyball spike techniques: injury prevention and performance. *Sports Biomechanics.* 2015; 14(2): 216-231. Doi: 14763141.2015.1052747

1. Everhart JS., Cole D., et al. Treatment options for patellar tendinopathy: A systematic review. *Journal of Arthroscopy.* 2017; 33(4): 861-872. Doi: 10.1016/j.arthro.2016.11.007. Epub 2017 Jan 16.

1. Briner WW Jr., Kacmar L., Common injuries in volleyball. Mechanisms of injury, prevention, and rehabilitation. *Journal of Sports Medicine.* 1997 Jul;24(1):65-71. doi: 10.2165/00007256-199724010-00006