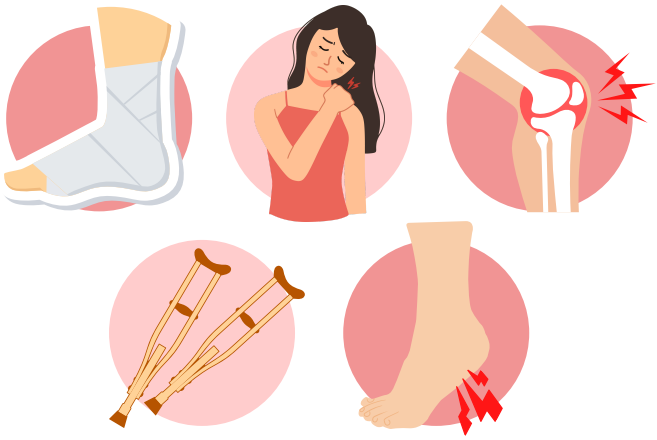
INJURY AND THE FEMALE ATHLETE

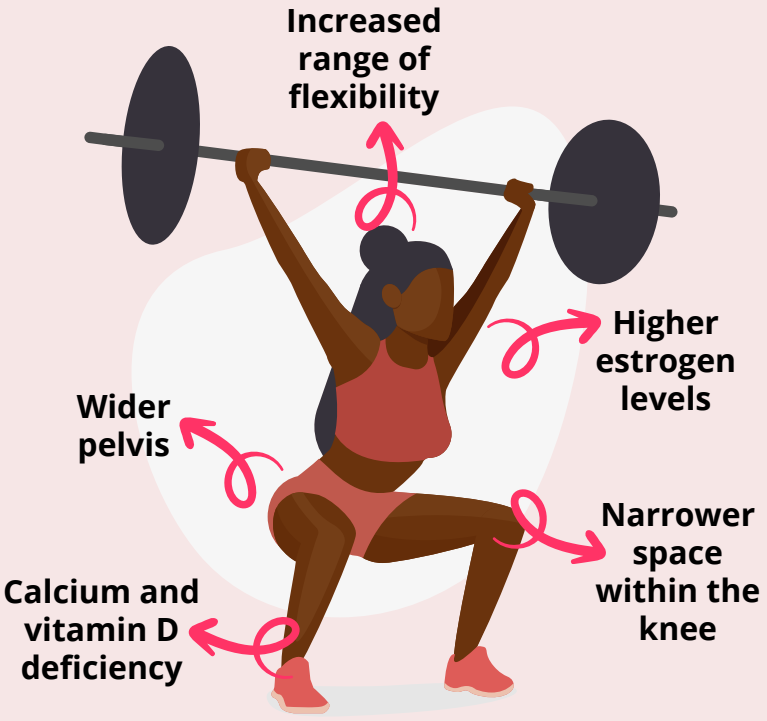
SPRING FORWARD FOR GIRLS

Common Injuries in Female Athletes

- Ankle Sprain
- Shoulder Instability & Tendonitis
- Patellofemoral Syndrome & ACL Tears
- Stress Fractures in Lower Leg and Foot
- Plantar Fasciitis (1)



8x Female athletes are up to 8x more likely to tear their ACL than male athletes. The increased risk of ACL injury in females is due to gender differences in muscle strength and control around the knee during pivoting, cutting and landing (4).



Why are female athletes at heightened risk of certain injuries?

The female body is unique in that there are higher estrogen levels, increased range of flexibility, wider pelvis (which affects movement and alignment of hip, knee and ankle), narrower space within the knee for ligaments and increased likelihood of inadequate calcium and vitamin D intake. (1)

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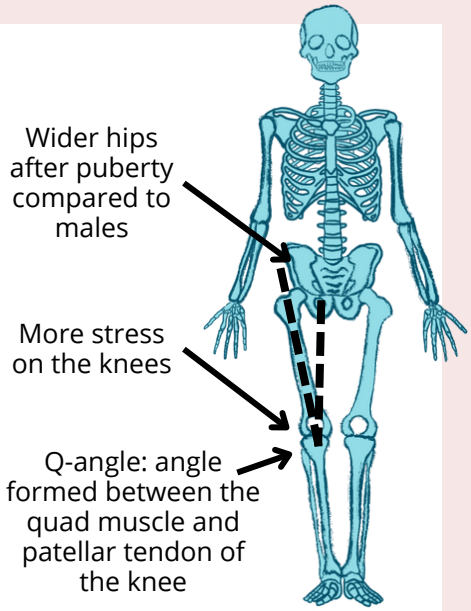
Key Differences for the Female Athlete

Female athletes have a distinctive set of physiological and biomechanical responses to physical activity that are risk factors for injuries. The better we understand these risk factors the more precise we can specifically target and prevent injuries. (5)

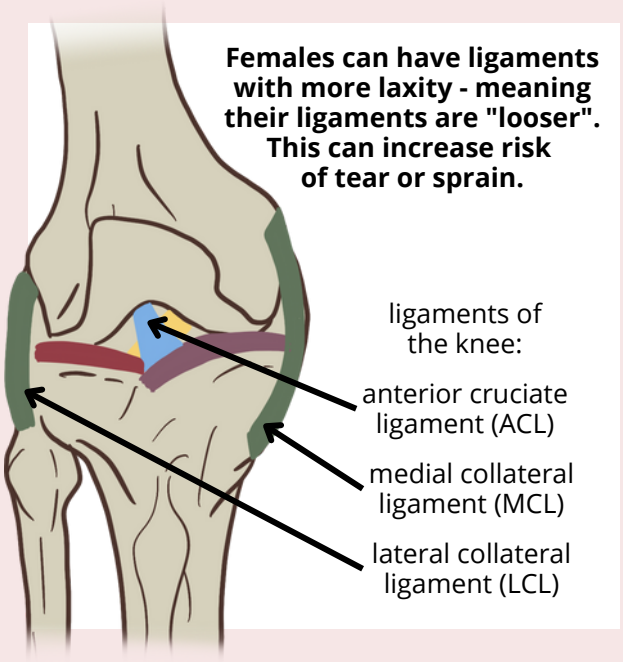
- Biomechanics
- Greater neuromuscular fatigue
- Greater flexibility
- Lower collagen synthesis
- Poor bone health



Females have a larger Q-angle than males which can predispose them to certain injuries.

Biomechanics

- Differences in jump landings and side to side movements
- Women land with their knees less flexed and with more valgus (inward) which puts more stress on ACL and leads to increased injury risk
- Women have a greater knee abduction load during side to side movement which also increases ACL injury risk
- Smaller and narrower intercondylar notch (where the ACL passes through in the knee) = increased ACL impingement



Females can have ligaments with more laxity - meaning their ligaments are "looser". This can increase risk of tear or sprain.

Neuromuscular fatigue

- Increase in fatigue lowers the force generating capacity of the muscles and affects motor control and reaction times, which can lead to injury

Flexibility

- Women have increased flexibility and joint laxity
- Joint laxity leads to excessive motion and strain at the joints and also requires increased muscle activity for joint support, which can cause strain on surrounding ligaments - all of which may increase injury risk
- Suggested link between fluctuations of hormones with the menstrual cycle and joint laxity

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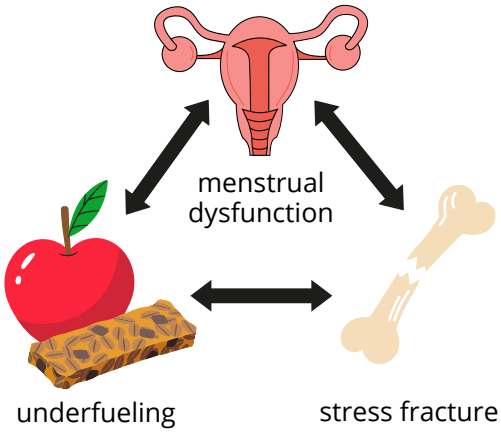
Hormones

- Collagen is an important part of connective tissues like ligaments and tendons
- Estrogens can inhibit collagen synthesis in response to exercise, which may lower the rate of tissue repair after exercise and lead to decreased recovery and increased injury risk

Bone Health

- Female athletes are at greater risk for stress fractures
- Women often have lower bone mass than men = increase risk of fractures



Additional Risk Factors

There is a higher incidence of sports-related injuries in female athletes with disordered eating and menstrual dysfunction. Female athletes with disordered eating and/or menstrual dysfunction may be at a greater risk for changes in bone mineral density which can lead to increased risk of stress fractures. Female athletes with a previous injury are at an even higher risk to have another musculoskeletal injury during their sports season. (2)

What Can We Do About It? - Prevention!

When focusing on modifiable risk factors and prevention strategies, injury prevention can reduce long term consequences. (3) Injury prevention programs can be helpful because they focus on targeting muscle imbalances and strength around the knee as well as core and hip strengthening and control. (4)

Proven methods to help decrease the risk of injuries: (3)

- Neuromuscular training programs (plyometrics, strength training, stretching, balance and agility), particularly for ACL tear prevention
- Learning proper and safe exercise techniques, such as understanding limits of range of motion of specific joints and avoiding positions that increase risk of injury
- External supports (ankle braces and taping) can reduce ankle injuries

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Citations

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