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Sports Specialization and Overuse Injuries in Youth Athletes

Risks and Recognition

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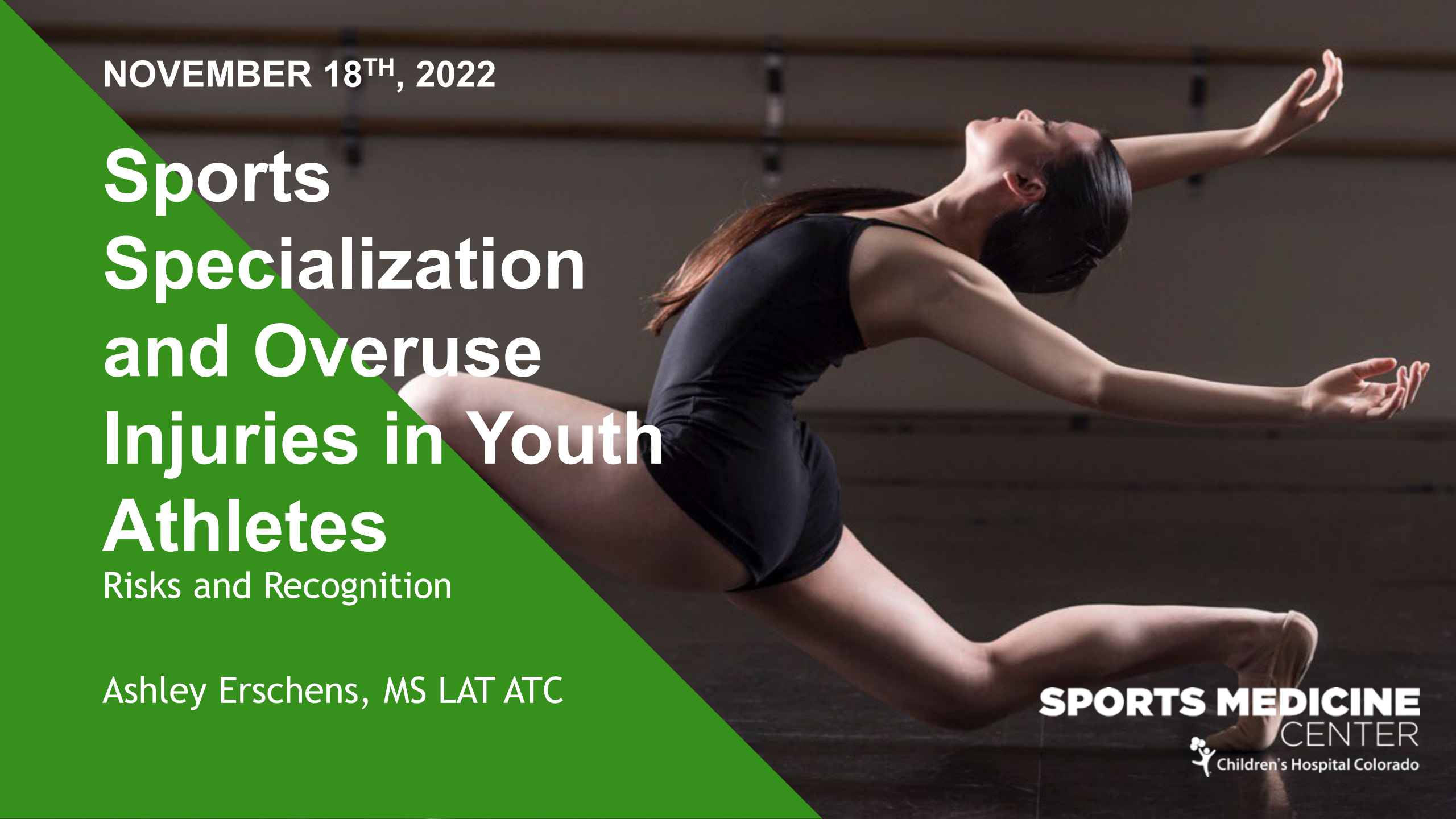

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Disclosures

- No disclosures

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Trends in Youth Sports

- According to the American Academy of Pediatrics (AAP) roughly 60 million kids (age 6-18) participate in organized youth sports
  - ~70% drop out of organized sport by the age of 13

- Focus has shifted from general physical activity and enjoyment of play to performing at a high level
  - These pressures are often from parents and coaches
  - This has led to an increase in training volume, frequency, and intensity

- This has led to an increase in single sport athletes
  - College scholarship
  - Professional aspirations
  - Recognition – peer, parent, coach

What is Sport Specialization?

- When an athlete participates in one organized sport
  - may decide to discontinue other sports or never tries them in the first place
- Often participates year round (8+ months out of the year)
  - Club (sometimes multiple) , travel teams, school, individualized training, etc.
- Can be split into early specialization and late specialization

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Early Specialization

- Before puberty – as young as 6yrs old
- Shifts focus of young athletes to skills development and success rather than play and enjoyment
- Can separate athletes from their peers
- Can lead to a decrease in motivation and enjoyment of the sport
- Usually result in a shorter athletic career
- Higher risk of injury

Late Specialization

- After puberty – usually between 15-16 years old
- Able to try a multitude of different activities
- Learn the fundamentals of movement and improves physical, cognitive, and psychological readiness for sport
- This usually results in more success in their sport of choice later
- Decreased risk of injury

Is sports specialization associated with overuse injuries?

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Short Answer: Yes.

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Research Shows:

A systematic review that concluded that sport specialization is associated with an increased risk of overuse injury. *Bell, et al. 2018*

- High level of specialization 81% increase in overuse injury
- Moderate level 18% more likely

A study done in NZ found that highly specialized youth football players were 4x as likely to develop an overuse injury compared to their counterparts. *Zoellner, et al. 2022*

A study done on Little League baseball players showed that there was a correlation between high specialization and a lower arm health score on the Youth Throwing Score survey. *Post, et al. 2021*

- Traveling for showcases/tournaments >/= once per month worsened the YTS score
- Pitching also was correlated with a lower YTS score

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How do Overuse Injuries Occur?

Overuse injuries can occur with repetitive stress on bodily structures with inadequate recovery time or with high intensity training that structures aren't ready for, even with adequate rest time between trainings

- These injuries occur at muscle, tendon, and growth sites

Overuse injuries in youth athletes present predominately as physeal injuries due to it being where muscle tendons attach at the weakest part of the bone before full skeletal maturity

- There is too much demand occurring on the immature structures

So, what are the risk factors for Overuse Injuries?

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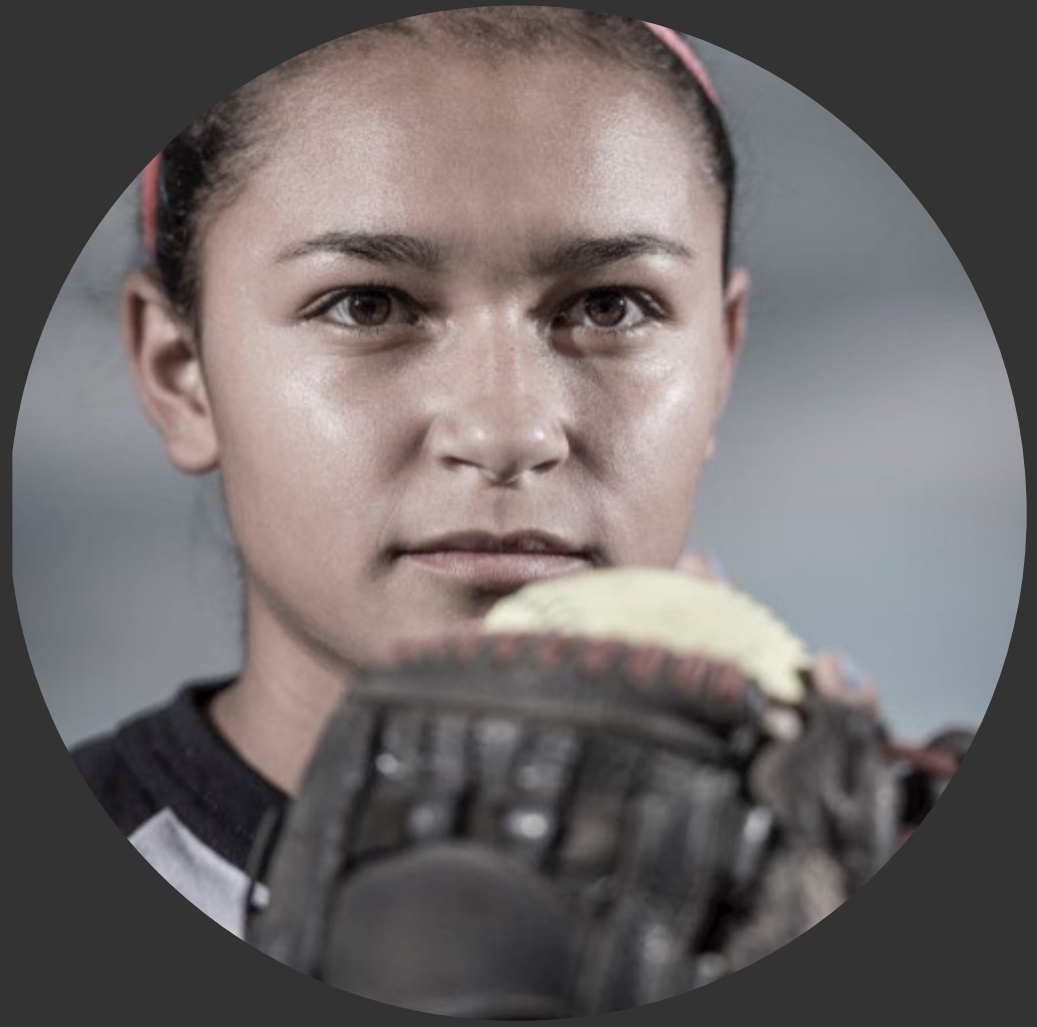
Non-modifiable Risk Factors

- Age
- Height and weight
- Timing of growth spurts
- History of previous injury
- Anatomic abnormalities
    - Pes planus/cavus
    - Genu valgum/varum
    - Cubital valgum/varum



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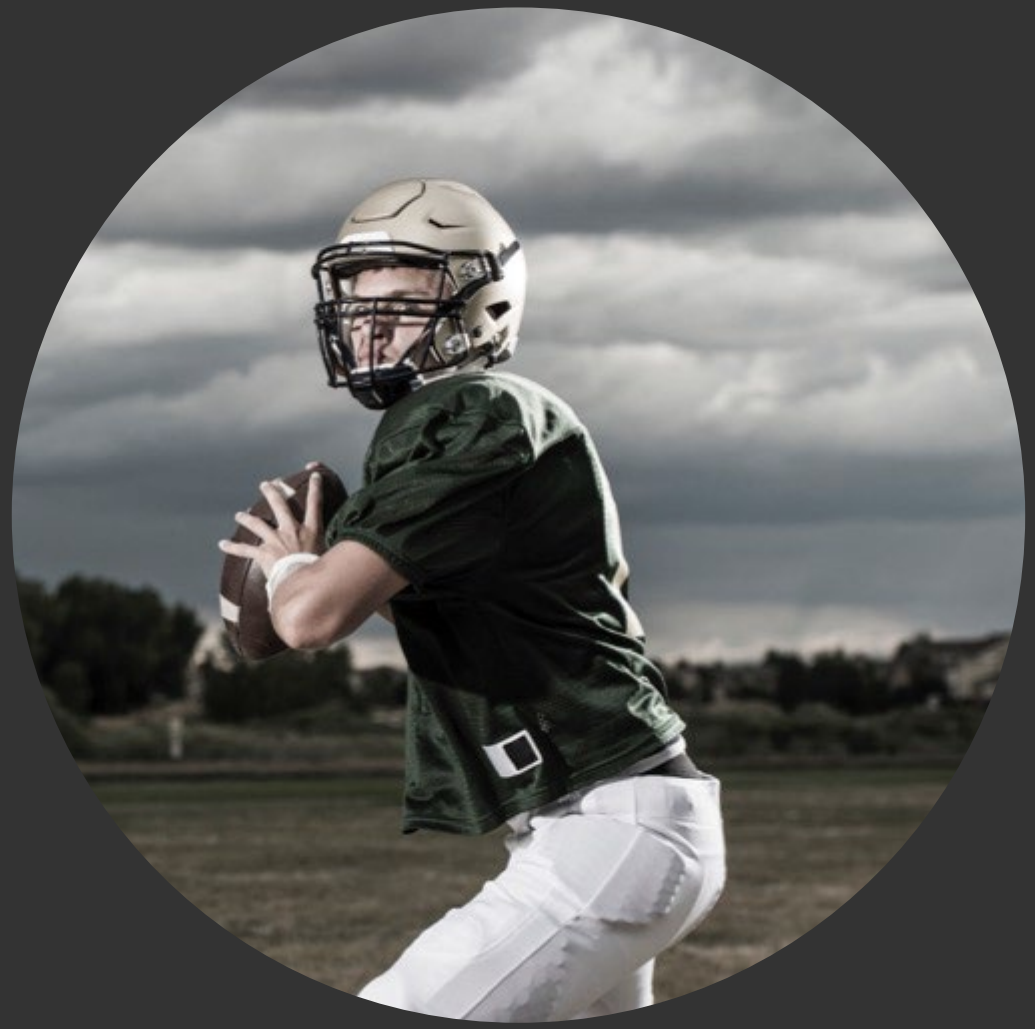
Modifiable Risk Factors

- Flexibility/Mobility restrictions
- Lack of strength
- Coaching style
- Training volume
- Poor technique
- Poorly fitted equipment
- Outside pressure from adults



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Risks that can be attributed to Sports Specialization:

- Repetitive loading
- Limited recovery time
- Longer sports seasons
- Year round training
- Coaching styles
- Outside pressure

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How does this all relate to athletic training and other sports medicine professionals?

As athletic trainers, we are often the first contact for youth athletes when they are reporting or sustain an injury.

We need to understand signs/symptoms as well as risk factors for overuse injuries

This information in crucial to our evaluation as well as our decision making process for the plan of care

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Important History Questions:

- When was the initial onset of pain – very first time not when it was severe enough to seek medical attention
- Specific site of pain
- When does the pain occur
- What sports are played and how involved are they
- Any previous injuries
- Recent growth spurts
- How often do you get rest time?
    - Weekly/monthly/yearly

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Clinical Evaluation Exam Points:

- Palpation
- ROM/Flexibility
- Strength
- Alignment
- Special tests

Recommended to have the athlete either perform the aggravating movements or come for evaluation directly after activity

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Common Overuse Injuries in Youth

Little league shoulder -Repetitive stress injury (typically by traction) to the humeral physis

Little league elbow – Apophisitis of the medial epicondyle

Gymnast Wrist – Repetitive stress injury by compression to the distal radial physis

Spondylolysis – Repetitive stress injury to pars interarticularis

Osgood-Schlatter – Apophisitis of insertion of patella on tibial tuberosity

Sinding-Larsen-Johansson – Apophisits of the inferior pole of patella

Sever Disease – Calcaneal Apophisitis

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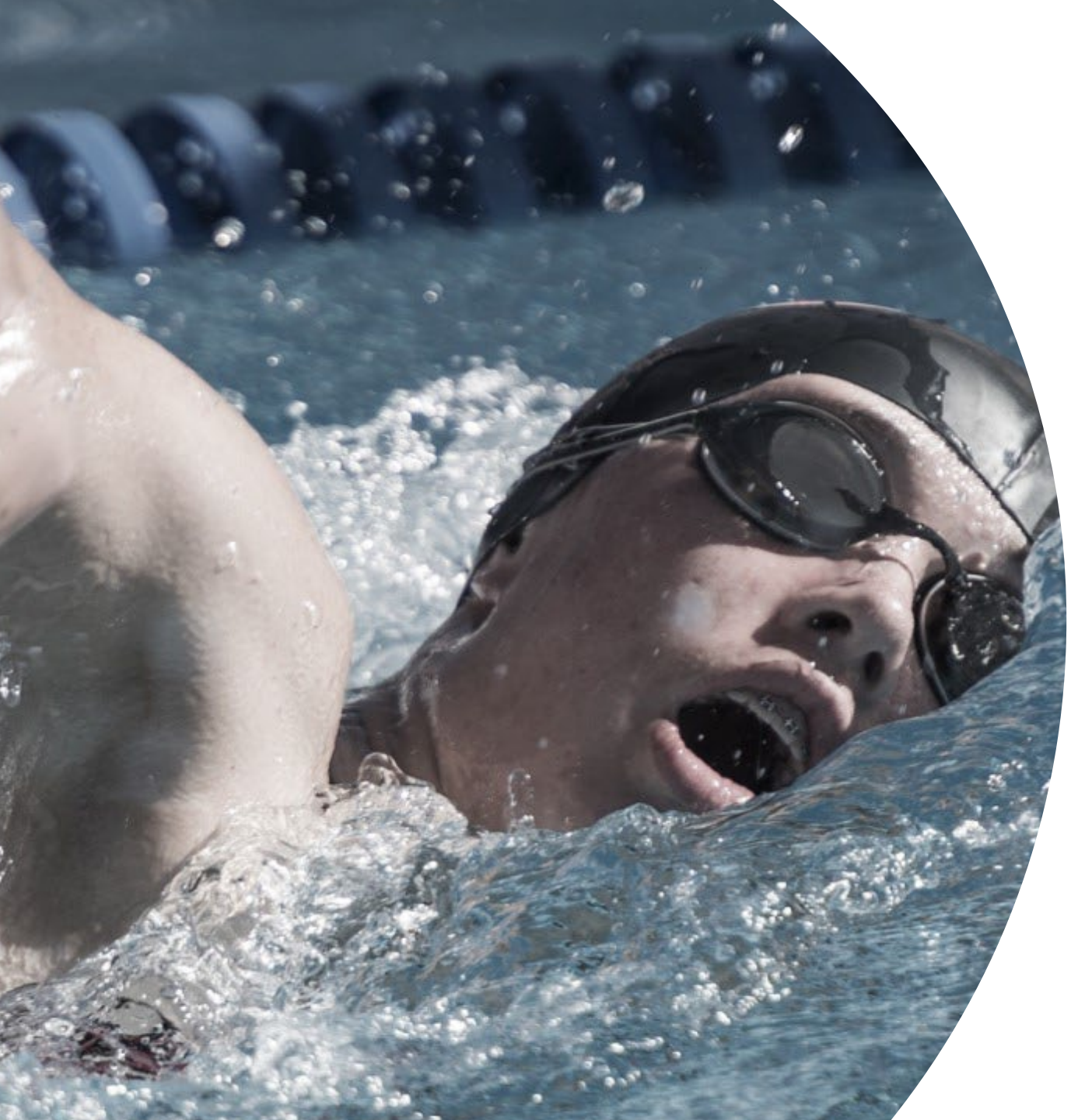

Little League Shoulder

- Can occur in any overhead athlete – baseball, swim, volleyball, tennis
- Onset is typically around 14 years old
- Will usually present as lateral shoulder pain with overhead motion

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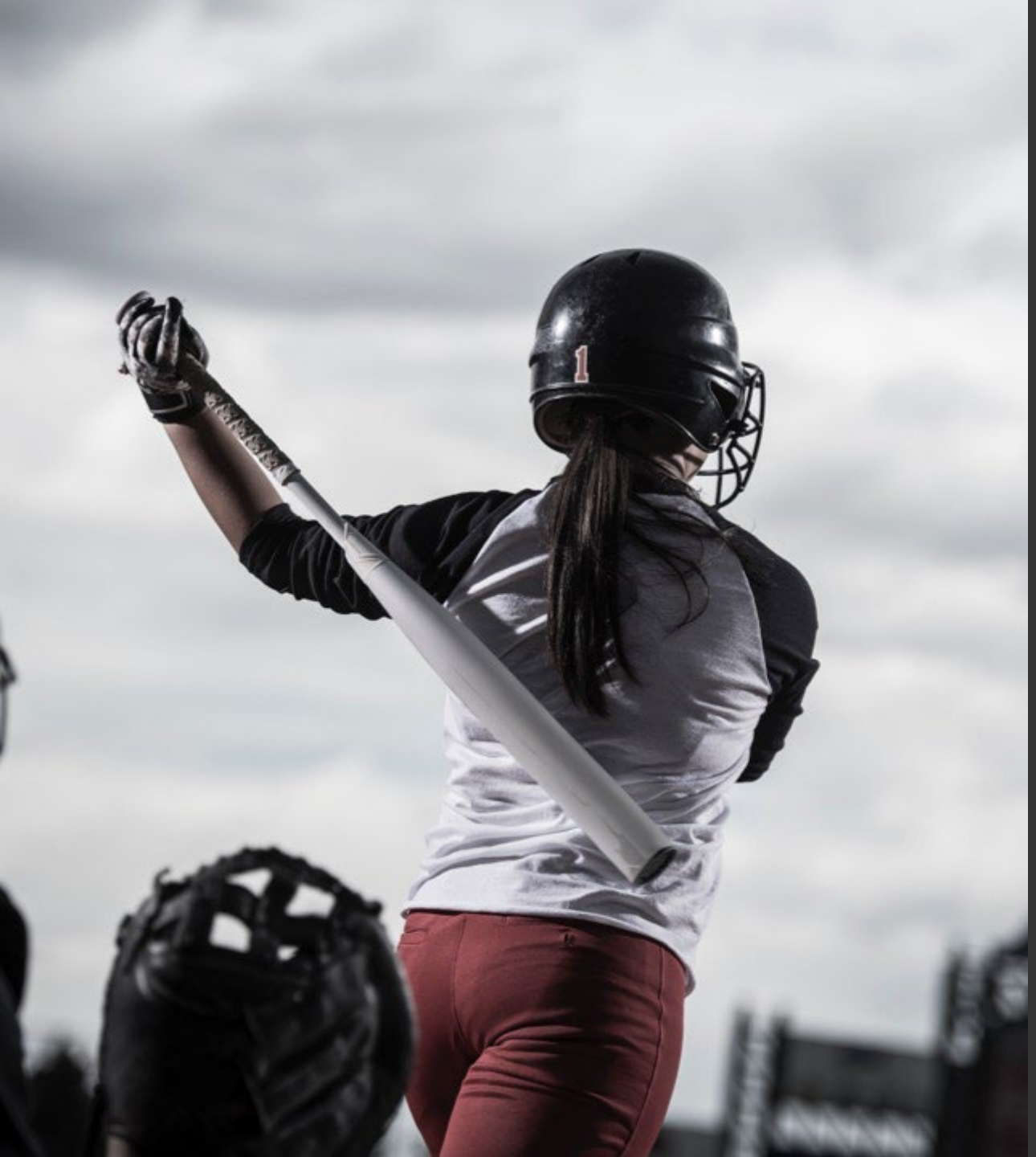

Little League Elbow

- Most commonly seen in throwers
- ~ 9 – 12 years old
- Considerations:
  - Position played
  - Pitch count
  - Do they throw breaking pitches?
  - Have they had a loss of velocity or control?

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Gymnast Wrist

- Most common in gymnasts and divers
- Unique to this population due to upper extremity weight bearing
- ~ 10 – 14 years old

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Spondylolysis

- Hyper lordosis
- Decrease in ROM
- Posterior chain tightness
- Positive Stork Test

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Osgood-Schlatter / Sinding-Larsen-Johansson

- ~ 10-15 years old
- Often cutting, jumping, and running athletes
- Can be bilateral
- Sinding-Larsen-Johansson is less common

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Sever Disease

- ~ 5-11 years old
- Often running and jumping athletes

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Recap

- Sports specialization is becoming more frequent among youth athletes and there is a correlation of increased risk of overuse injury with that
- Overuse injuries typically present as physeal injuries in youth athletes
- It is important to understand the risks, sign/symptoms, and common overuse injuries we will see in our practices as athletic trainers and sports medicine professionals

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