



AT THE FOREFRONT
**UChicago
Medicine**



Pediatric Overuse Sports Injuries

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Disclosure

- Neither I, [Holly J. Benjamin](#), nor any family member(s) have any relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within the presentation.



Objectives

- Discuss risk factors for pediatric overuse sports injuries
- Define burnout
- Briefly discuss high risk overuse injuries seen in soccer
- Identify strategies for overuse injury prevention



Epidemiology

- >30 million children participate in organized sports*
- >7.3 million H.S. students participate in athletics**
- H.S. athletics result in >2 million injuries annually***
 - 500,000 doctor visits
 - 30,000 hospitalizations
- >3.5 million children under age 14 are treated annually for sports injuries; ***many are already specialized****
- Overuse injuries account for half of all sports injuries in middle school and high school*
- Tracking injuries is difficult, reporting mechanisms lacking

**Safe Kids USA*

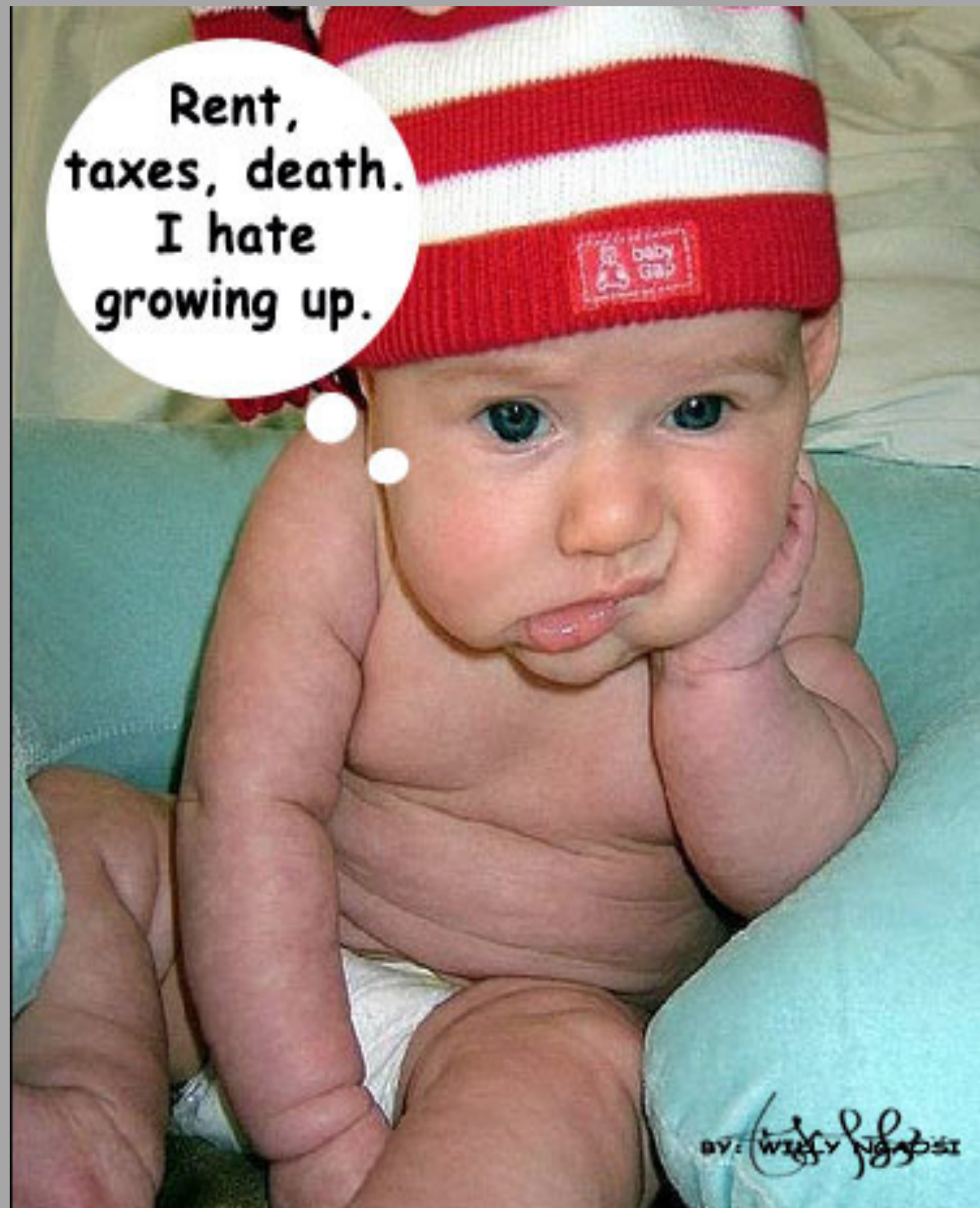
** *National Federation of State High School Associations*

*** *Centers for Disease Control*



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Burnout: hallmark is loss of enjoyment in sport participation coupled with poor performance

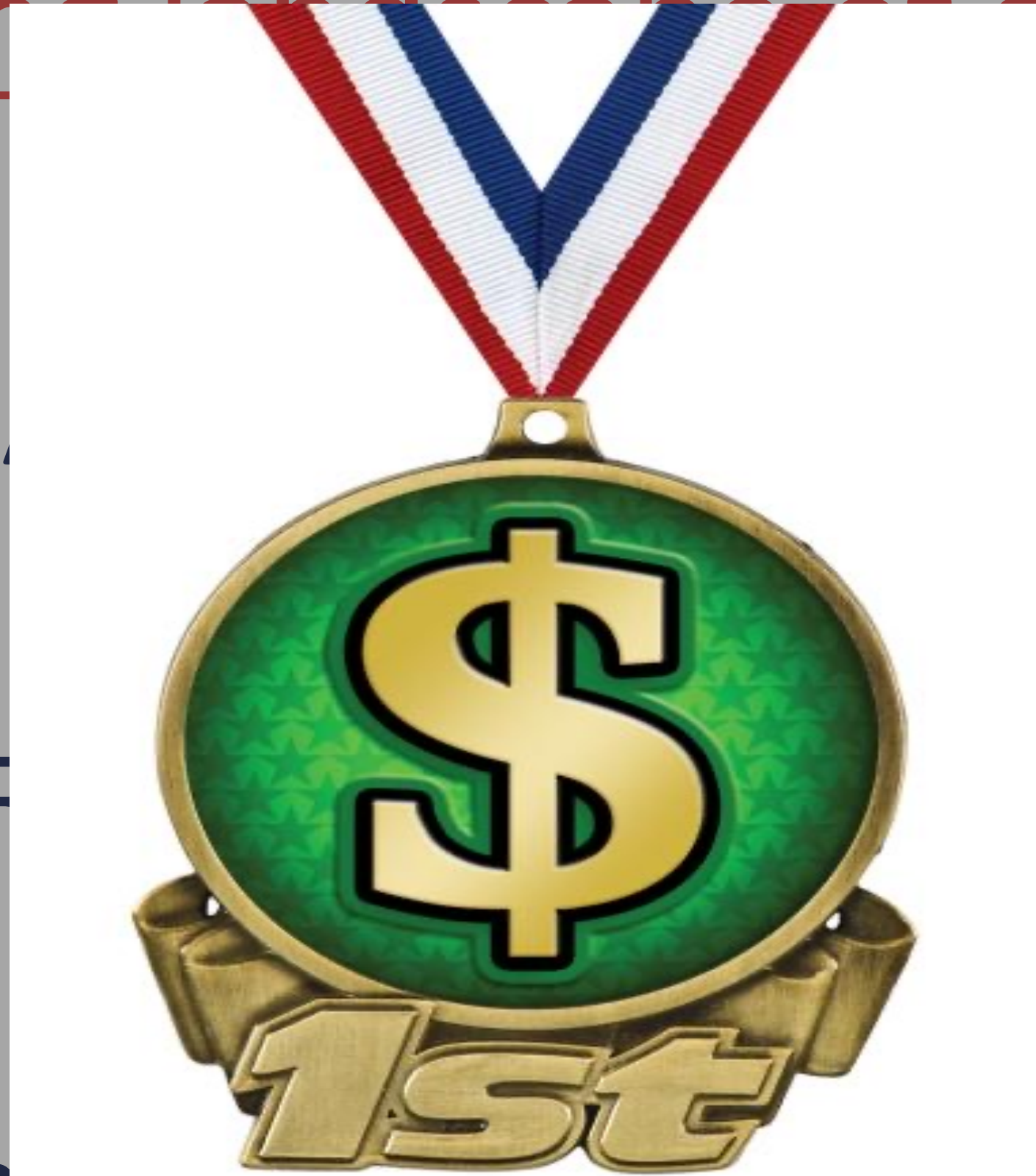


- *2.2% high school girls & 2.0% boys get college scholarships; 6% will play sports*
- *>70% of H.S. athletes quit organized sports by age 15*
- *0.2-0.5% of HS athletes ever make it to the professional level*
- *Highest transfer or dropout in NCAA is women's soccer*





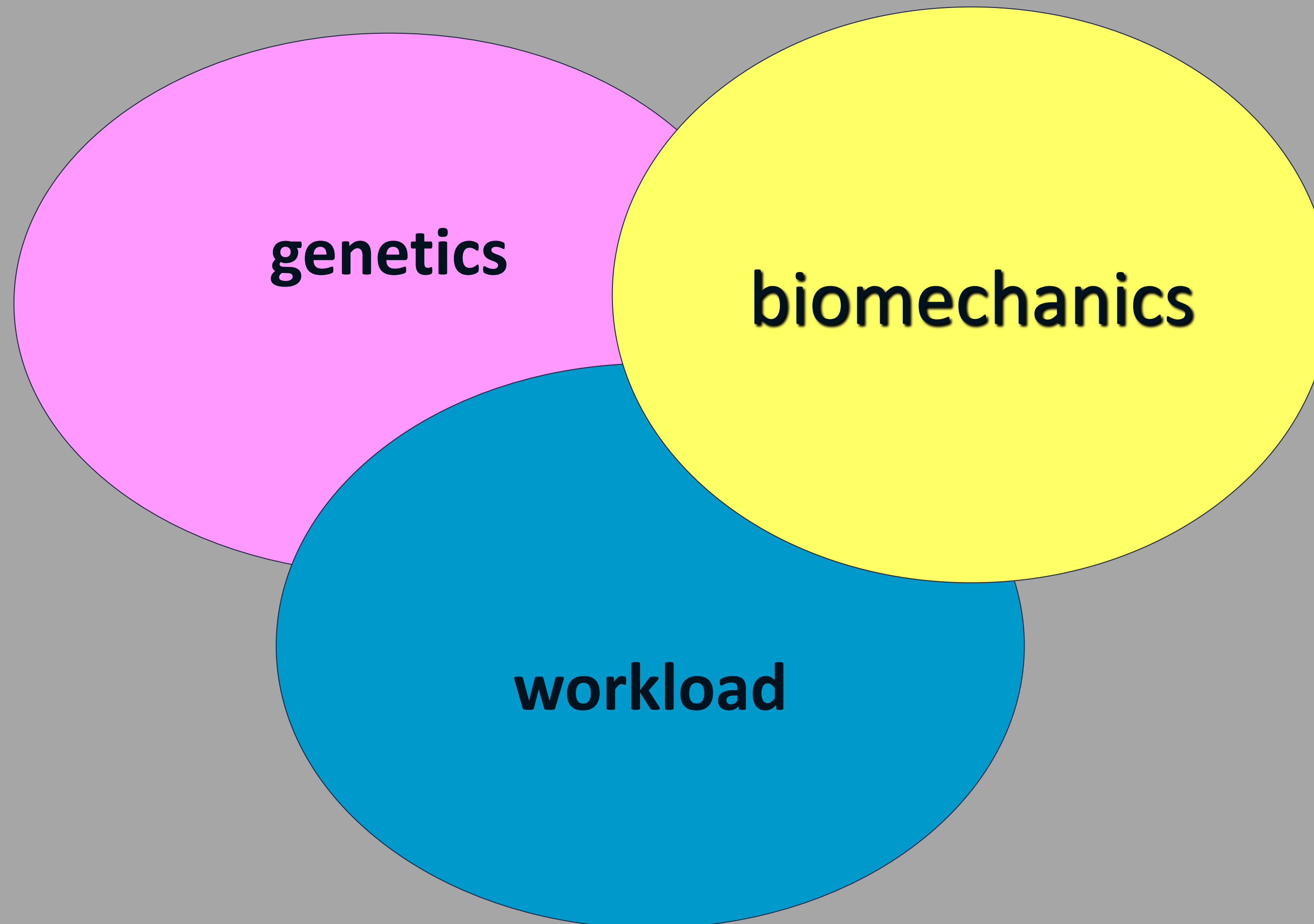
Changing landscape of sports



Interscholastic sports



Factors contributing to overuse injuries



Ref: Reider; Sports Medicine and the School Age Athlete



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Overuse tendonopathy model

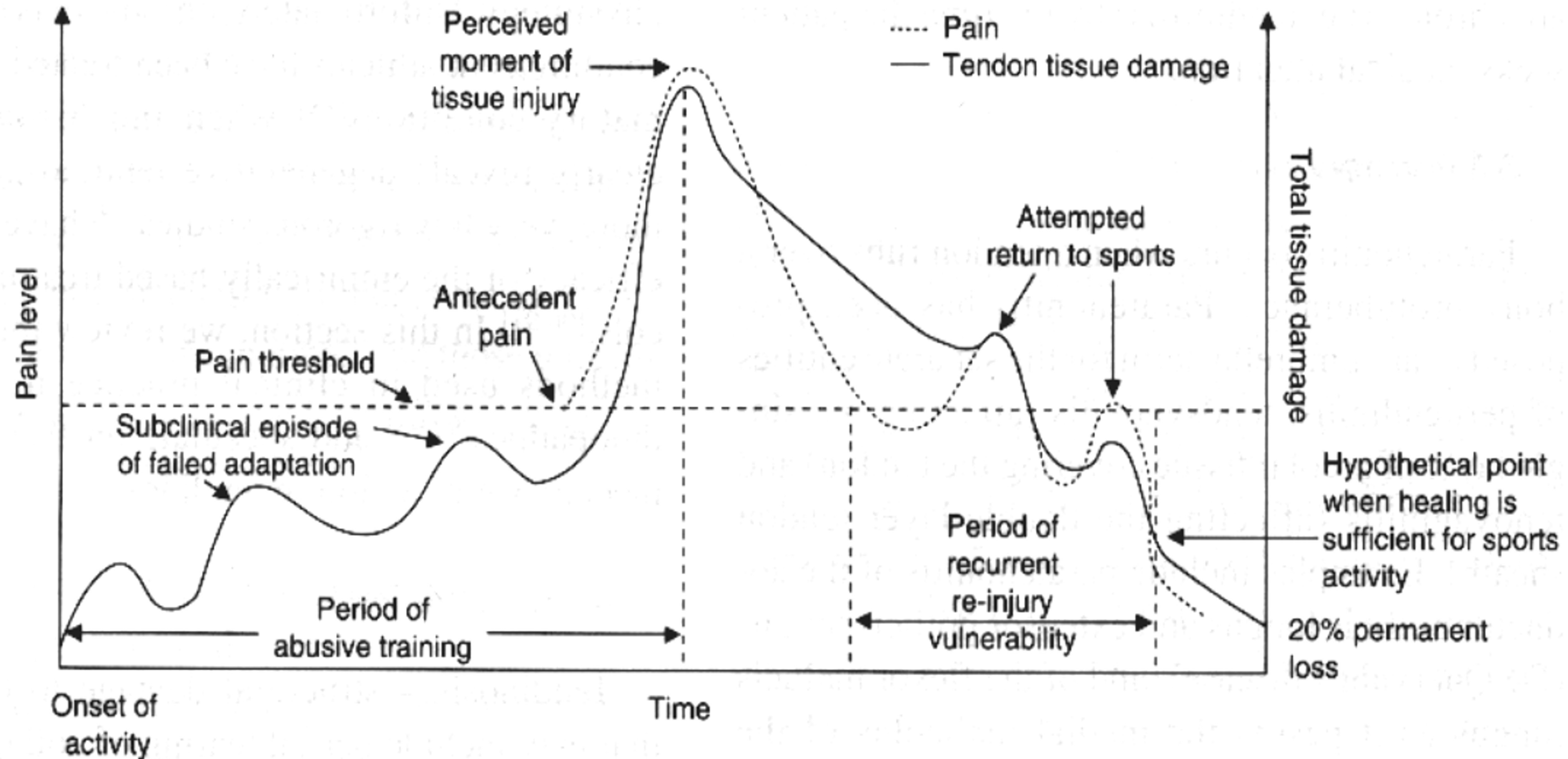


Fig. 3. Schematic illustration of pain and tissue damage in overuse tendinopathy. Tendon pathology may begin well before symptoms arise; therefore, recovery may take months, even in patients who present with recent-onset symptoms (reproduced from Leadbetter,^[80] with permission).

Risk factors for overuse injury*

➤ Growth related factors

- Susceptibility of growth cartilage to repetitive stress
- Adolescent growth spurt

➤ Other intrinsic factors

- Previous injury
- Previous level of conditioning
- Anatomic factors
- Triad/RED-S (energy imbalance)
- Psychological and developmental factors

➤ Extrinsic factors

- Training progression
- Overscheduling
- Inappropriate equipment/footwear
- Improper sport technique
- Psychological factors-adult and peer influences

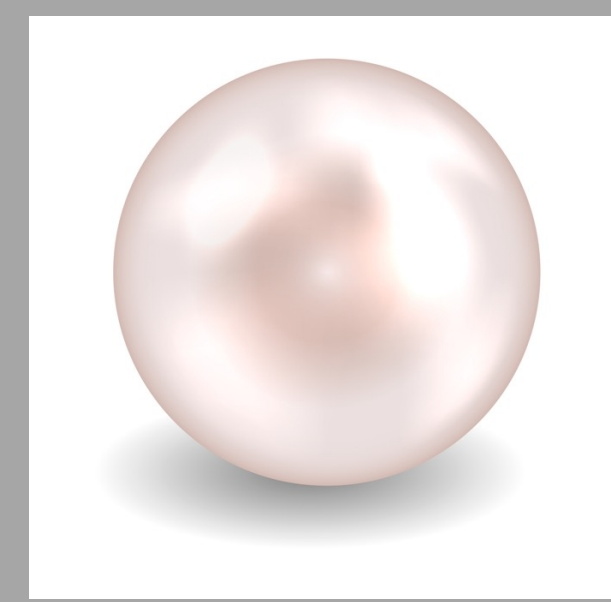


Difiori JP. Benjamin HJ, et al. Overuse injuries and burnout in youth sports. CJSM. 24(1), 2014



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Key points to successfully treating overuse injuries



- Make an accurate diagnosis
- For every injury (victim) there are underlying causes (culprits) – not really just “overuse”
- REST and NSAIDS (ibuprofen, Naprosyn, etc.) NEVER really heal an injury properly
- Proper rehabilitation addressing genetics, biomechanics and workload is the key

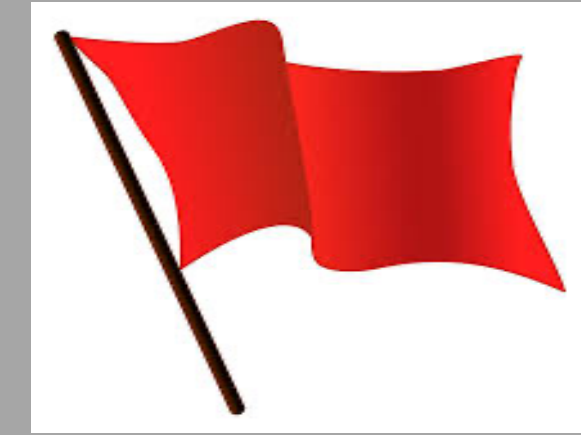


Victims and Culprits

- Soccer player or runner with anterior and lateral knee pain
 - Victim = knee
 - Culprit = tight IT band; weak glut. muscle
- Soccer player with heel pain and achilles tendonitis
 - Victim = overstretched Achilles
 - Culprit = cleats, old shoes, flat feet, growth spurt

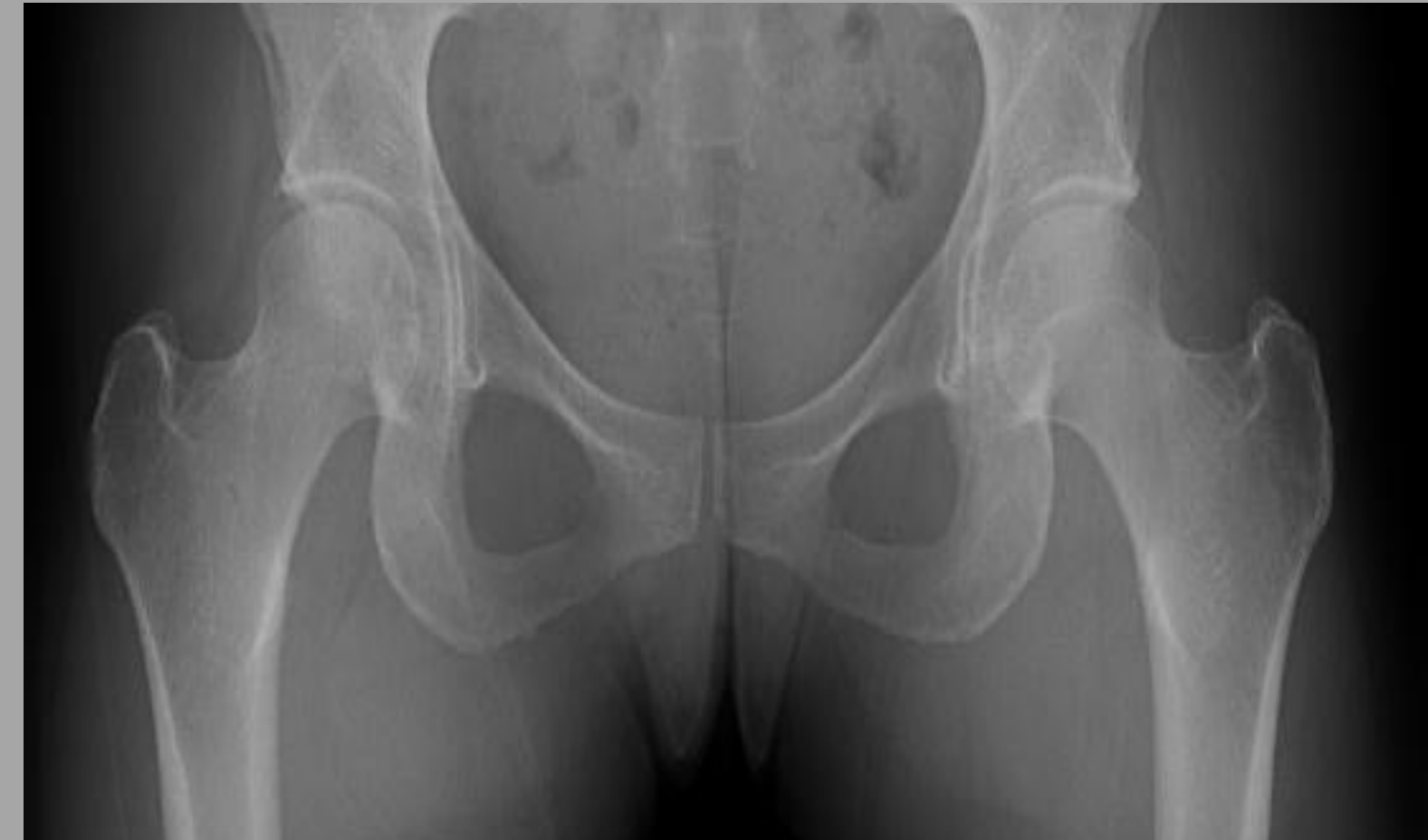


When to get imaging or refer



- **Medical advice:**

- Pain > 3 weeks
- Night-time pain, tingling or numbness, joint swelling
- Acute trauma
- Progressive limitations in sport performance



- **Imaging:**

- Xrays: bony anatomy
- MRI: look beyond the bone

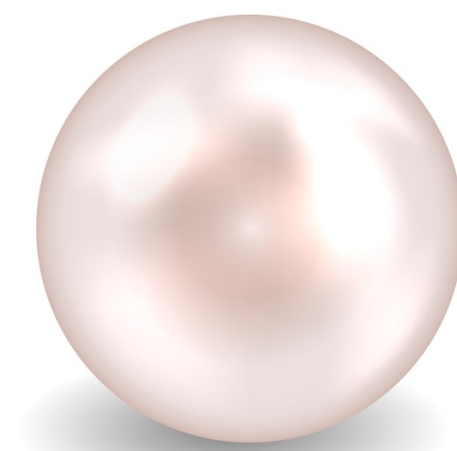


High risk overuse injuries soccer

LOCATION	SYMPTOMS
Hip pain Femoral neck stress fx = high risk Labral tear, sports hernia	Groin pain with weight-bearing, + hop test, pain with rotation
Tibia pain Stress fractures Exertional compartment syndrome	Reproducible bony tenderness (local = stress fx); tightness, pressure, cramping in legs (think comp. synd)
Foot pain medial (inside) foot Navicular stress fracture	vague, midfoot pain, possibly migratory, arch pain, bony pain
Foot pain lateral (outside foot) Jones fracture (5 th metatarsal)	Vague lateral foot pain, can be confused with ankle sprains, both acute and overuse occur



Pearls for prevention



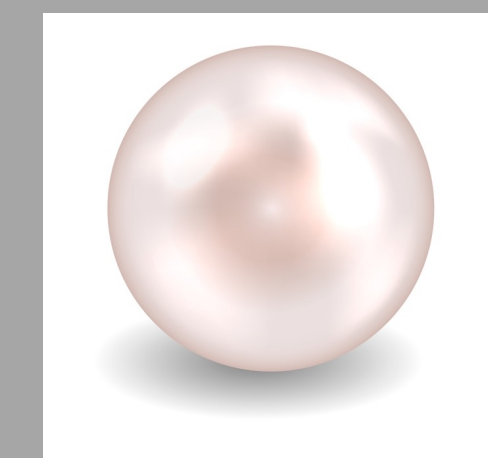
- AAP recommendations: amounts of “safe” exercise for children/adolescents is somewhat individualized*
- In general exercise limits include
 - Up to 5 days per week
 - 2-3 months off per year from sport
 - Cross-training permitted
 - Strength training and flexibility 2-3d per week—emphasis on core
 - Limit increases in exercise to 10% per week with reasonable maximums
 - Participate on only 1 team per season (that is more for multiple teams same sport—no data on multiple sports except raises risk for overtraining syndrome)

*Brenner, J. et al. Overuse Injuries, Overtraining, and Burnout in Child and Adolescent Athletes. *Pediatrics*. June, 2007; (119)(6).





Prevention of overuse injuries



- Reverse the patterns of early sports specialization (**meaning promote sport diversification, late specialization**)
- Education of coaches, ATC's, athletes and parents among others; follow rules & safety guidelines
- Encourage healthy lifestyles—nutrition, sleep & recovery
- Promote balanced training—5 d/wk; 2-3 months of rest per year; repetition limits where applicable
- flexibility & strength training programs should be incorporated
- Screen for injury, overtraining & burnout—athlete happiness, work ethic & performance
- See a physician for suspected injuries, especially in high risk athletes

*Brenner, J. et al. Overuse Injuries, Overtraining, and Burnout in Child and Adolescent Athletes. *Pediatrics*. June, 2007; (119)(6).
Update 2018



Thank-you!

