Primary Care Pediatric Sports Medicine

SPARCC

Sports Medicine • Rehabilitation • Concussion Care

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Objectives

- What is Pediatric Primary Care Sports Medicine?
- What is the best approach to diagnosis and management of sports injuries
- Who needs referral? MRI?
- Best way to facilitate care?

Pediatric Sports Medicine

- Diagnosis of common peds sports injuries
- Non operative management of acute/chronic injuries
- Encompasses >90% of all pediatric sports injuries from diagnosis to RTP
- Who falls in the 10% that requires more?

Common Pediatric SM injuries

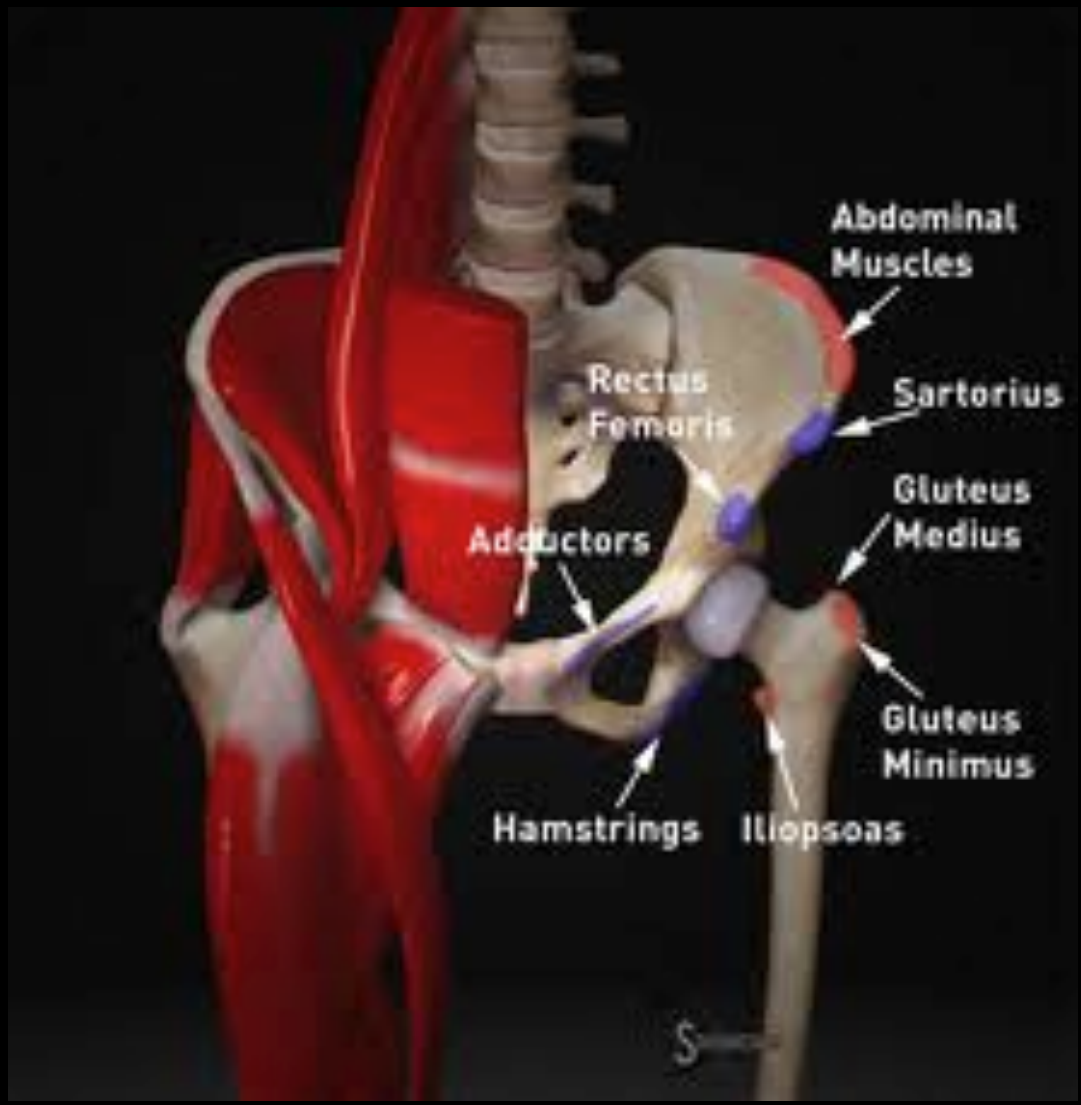
- Most fall into 3 categories:
  - Fractures
  - MSK injuries
  - Concussions/TBI

* Misc Exercise Rx (DM, EIA, CF, obesity, cardiac, female triad), Exercise Intolerance, Sports Nutrition/Perform, Injury Prevention

Common MSK Injuries

- Overuse injuries (stress fractures, PFPS, apophysitis)
- Physeal injuries
- Avulsion Injuries
- Joint instability (MDI, patellar instability)
- Ligamentous (ACL, ATFL, UCL, etc)
- Chondral injuries (Labral tear, OCD, etc)
- Musculotendinous (strains, tendonitis, spasm, tendinopathy)

Know your Apophyses…



Approach to diagnosis

- History is key! (when, where, why, how…)
- Acute or chronic?
- Mechanism of injury
- Pop? Swelling? Instability? Mechanical symptoms? Neurovascular symptoms?
- Aggravating factors? (what level of activity)

ACUTE or CHRONIC

<u>ACUTE:</u>

Fractures
Avulsions
Ligament sprains
Ligament tears
Dislocations
Contusions

<u>CHRONIC:</u>

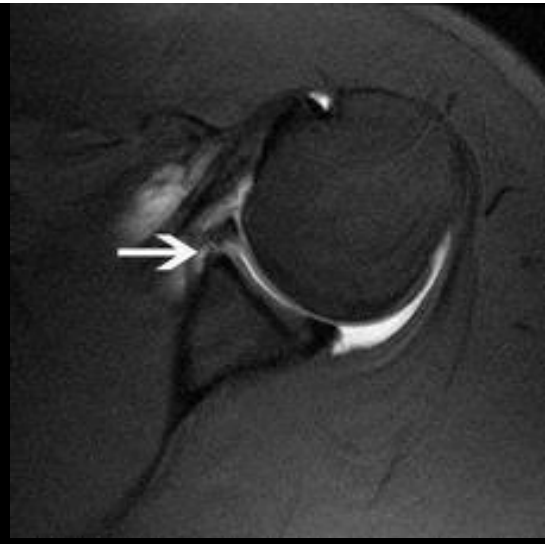
Stress fractures
Apophysitis
Instability
Subluxations
PFPS
Tendonitis
OCD

Diagnosis

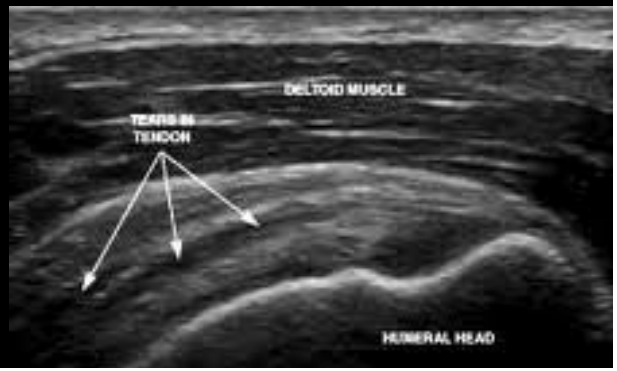
- History and Exam
- “IPRNS” examination
- Knowledge of anatomy/spec testing critical
- Knowledge of athletes sport, level, demand
- Proper Imaging

IPRNS

Imaging



- Typically begins with X-rays
- MRI: soft tissue injuries, physeal, and early bone injuries
- CT: characterizing boney injury
- MSK U/S: superficial soft tissue injuries (tendinopathy, bursitis) and dynamic stability/function



Management of Peds SM injuries

- RICE?….
- Also need to consider stability/protection
- Rest needs to specified (length, limits)
- Pain/swelling relief
- Appropriate REHAB needs to begin ASAP
- ROM, flexibility, stability, proprioception, strength, sport specific exercises, graded RTP

PRICEMMM

Management

- Majority improve with activity modification and Rehab
- Education on diagnosis and rehab is critical
- Formal PT referral versus home program
- Always follow up for sports clearance

sparcctucson.com > Patients > Handouts

Management

- Need to identify <10% that require further testing, MRI, or surgical referral
- WHO do I REFER?
- WHEN do I MRI?

Myths/Facts

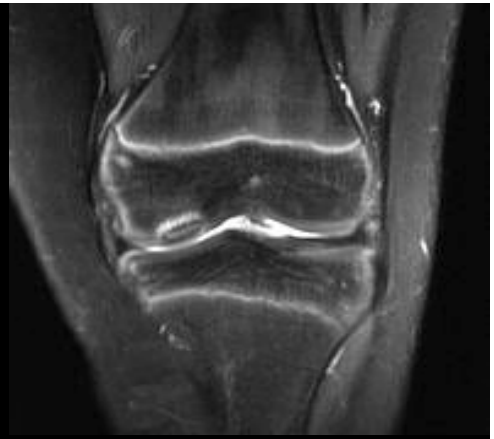
- Contrary to what the Pre – NBA, NFL, or Olympic athlete's parents believe
  - H & P more important than MRI

- MRI should be used to confirm diagnosis of suspected injury

When to MRI a joint

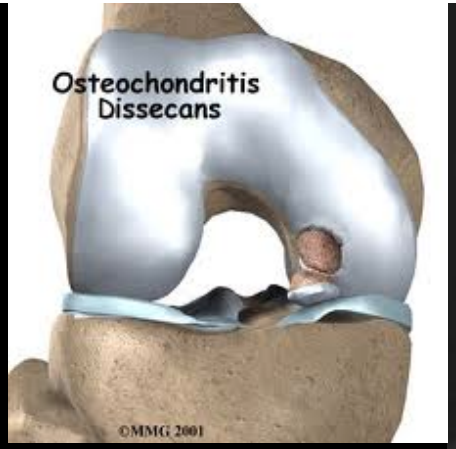
- Objective:
  - Effusion
  - + specialized testing of specific joint
  - Indicated by X-rays
- Subjective:
  - True Instability
  - True Mechanical symptoms
  - Non responsive to appropriate PT trial

Don’t Miss Diagnoses



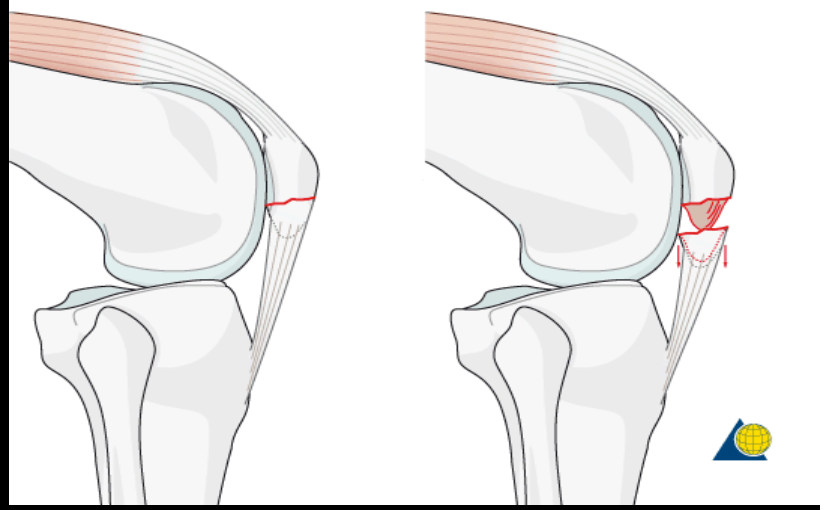
- ACL tear (internal derangement of knee)
- OCD/loose body
- Disrupted knee extensor mechanism
- Meniscus/labrum tear
- Fractures of joint surface (CT or MRI)
- Stress fracture, growth plate injury

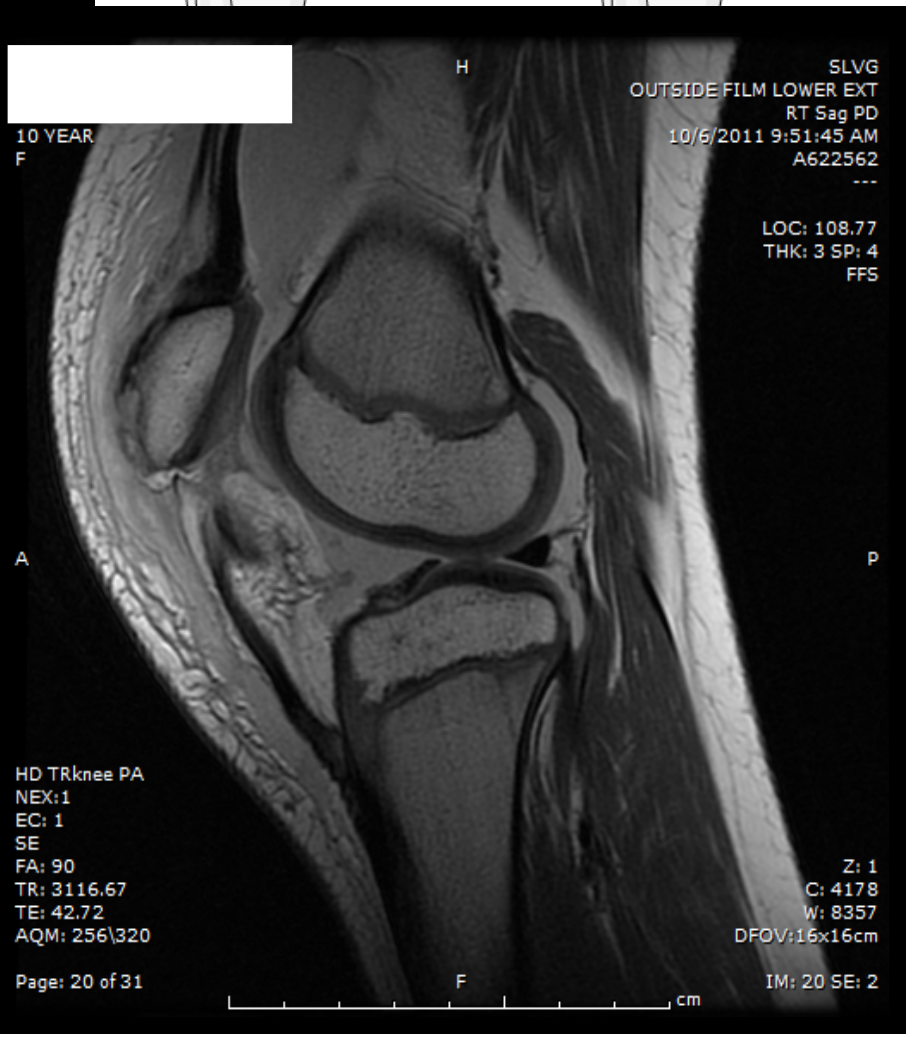
OCD



- Osteochondritis dissecans
- MFC/LFC, capitellum, talus

Patellar sleeve Fx





Traumatic Brain Injury (TBI)

- Currently majority of patients at SPARCC
- Distinguish Concussion from TBI with structural lesions (SDH)
- Distinguish Simple Concussion from Complex Concussion or PCS

Definition

Simple

- ✓ Resolves by 7-10d
- ✓ No complications
- ✓ Imaging/Formal neuropsychological evaluation unnecessary
- ✓ Most common form (75-90%)
- ✓ Rest until symptoms resolve
- ✓ Graded RTP Protocol

Complex (PCS)

- ✓ Persistent symptoms
- ✓ Specific sequelae
  - ✓ Prolonged cognitive impairment
- ✓ Imaging/Formal neuropsychological evaluation
- ✓ Specialist expertise
- ✓ Directed therapy

Concussion Management (acute)

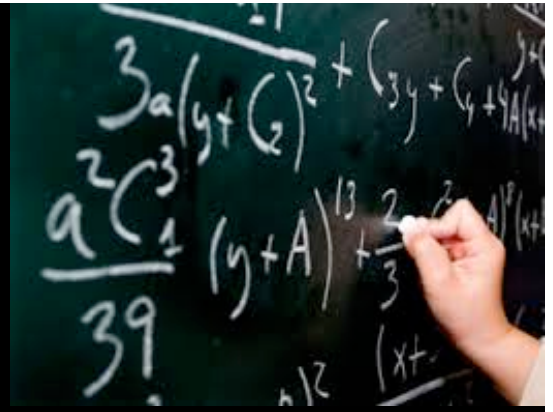
- Activity restriction
- School accommodations
- Trigger avoidance
- Sleep, nutrition, hydration
- Impact testing prior to clearance (contact sports)

- Discourage excessive brain stimulation:
  - Eliminate or limit…
    - ✘ **TEXTING**
    - ✘ VIDEO GAMES
    - ✘ INTERNET
    - ✘ T.V.
    - ✘ LOUD MUSIC
    - ✘ KNOWN TRIGGERS

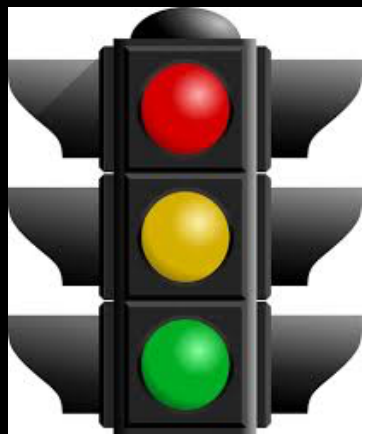
Do not go over the symptom threshold!

- Allows the brain to continue healing without prolonging symptoms
- Keeps the student stimulated (avoid potential for increase in depressive symptoms)

Cognitive Rest



- Depending on severity of symptoms may need up to 1-2 days off (RED)
- Early return with full individualized accommodations (ORANGE)
- RELATIVE cognitive rest (YELLOW)
- Gradual return to normal school work as tolerated (GREEN)



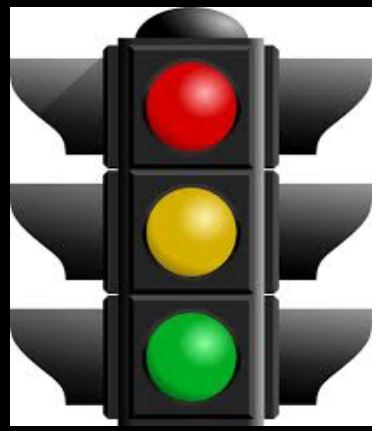
Concussion Guidelines for Teachers

RED ZONE

- Student needs total cognitive rest. Should not be in school or doing academic work.

ORANGE ZONE

- Half days; Attendance may be inconsistent
- Prioritize assignments based on most essential goals of course
- If symptoms worsening, send student to the nurse
- Expect limited class participation
- Avoid tests, quizzes, and computer or screen-based assignments
- May need audio books, scribe, or oral exams
- Help student accommodate light and noise sensitivity



YELLOW ZONE

- Excuse past assignments and units as possible
- Student should only take one test or quiz a day
- Extended time on tests or large assignments

GREEN ZONE

- For new work, academic expectations can be back to usual
- Make up tests and missed critical work (not all work)

PCS Management (chronic)

- Neurocognitive or NP testing
- Active rehab protocol
- Vestibulocular rehab
- PCS labs?
- MRI brain?
- Targeted pharmacologic options

What is “Active Rehab”

- Activity is used in a controlled supervised manner as PART of PCS treatment
- Typically started at 3-6 weeks post injury after PCS assessment
- Sub-symptom threshold exercise!
- Terminated if Sx exacerbated

Wiler etal 2012
Gagnon etal 2009

SPARCC Active Rehab Protocol

- Step 1: 50-60% HRM for 10-12 min
- Step 2: 60-70% HRM for 12-15 min
- Step 3: 70-80% HRM for 15-18 min
- Step 4: Full exercise tolerance testing (80-90% MHR)
- *All steps include cervical and vestibular exercises post exertional exercise*

VOMS

- Smooth Pursuits
- Accommodation (<6-8cm)
- Saccades (V/H)
- VOR/dolls eye (V/H)
- Visual Motor sensitivity

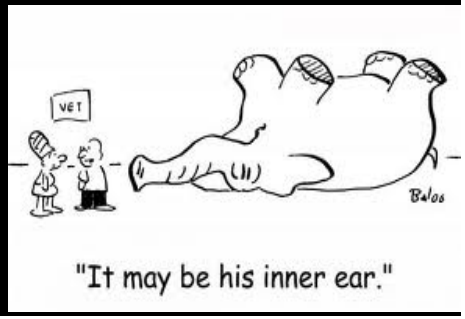
Mucha, AM etal. A Brief Vestibular/Ocular Motor Screening (VOMS) Assessmentto Evaluate Concussions: Preliminary Findings. Investigation performed at the University of Pittsburgh, Pittsburgh, Pennsylvania, USA. 2014.

VOMS

Vestibular Rehab

- Utilizes movement-based therapy to retrain the vestibulo-ocular system
- Incorporate desensitization, eye/head exercises, and balance retraining
- Moderate to strong evidence in support of these vestibular interventions

Hillier etal; 2011



Vestibular Rehab

Role of Medications in PCS

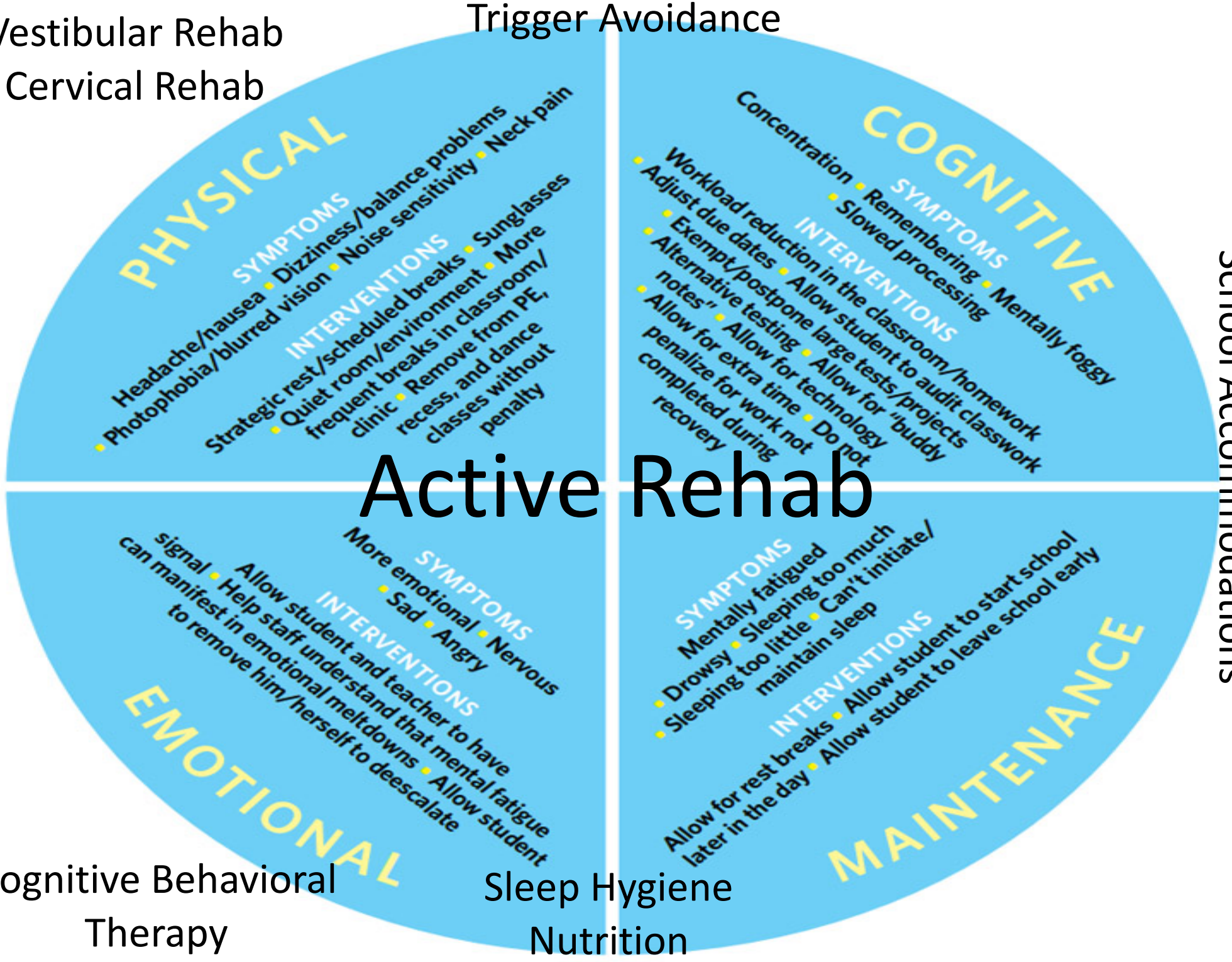
- Can help with symptomology
- No impact of PCS outcome/duration
- OTC (Tylenol/Advil), sleep aids, SSRI, TCAs
- Focus on non pharm, prevention strategies
- Discontinue meds if not helping

Nutrition & Hydration

- Dehydration and poor nutrition are known symptom triggers
- Fresh non processed foods
- EPA, fish oil (1000mg BID)
- Magnesium (400mg qd), Vit D (2000IU)
- Avoid high glycemic index, caffeine, alcohol

Vestibular Rehab
Cervical Rehab

Trigger Avoidance



School Accommodations

Cognitive Behavioral
Therapy

Sleep Hygiene
Nutrition

Case

- 15 year old healthy boy with elbow to head playing HS basketball
- Brief LOC, dizziness, mild amnesia
- Expected to improve after 1-2 week rest
- Continued to have HA, dizziness

Case (4 weeks later)

- Has been instructed to rest and focus on nutrition and sleep
- Part time school, no activity
- Now having insomnia, anxiety, worsening headaches and neck pain
- Normal Brain MRI
- Watchful waiting for brain healing?

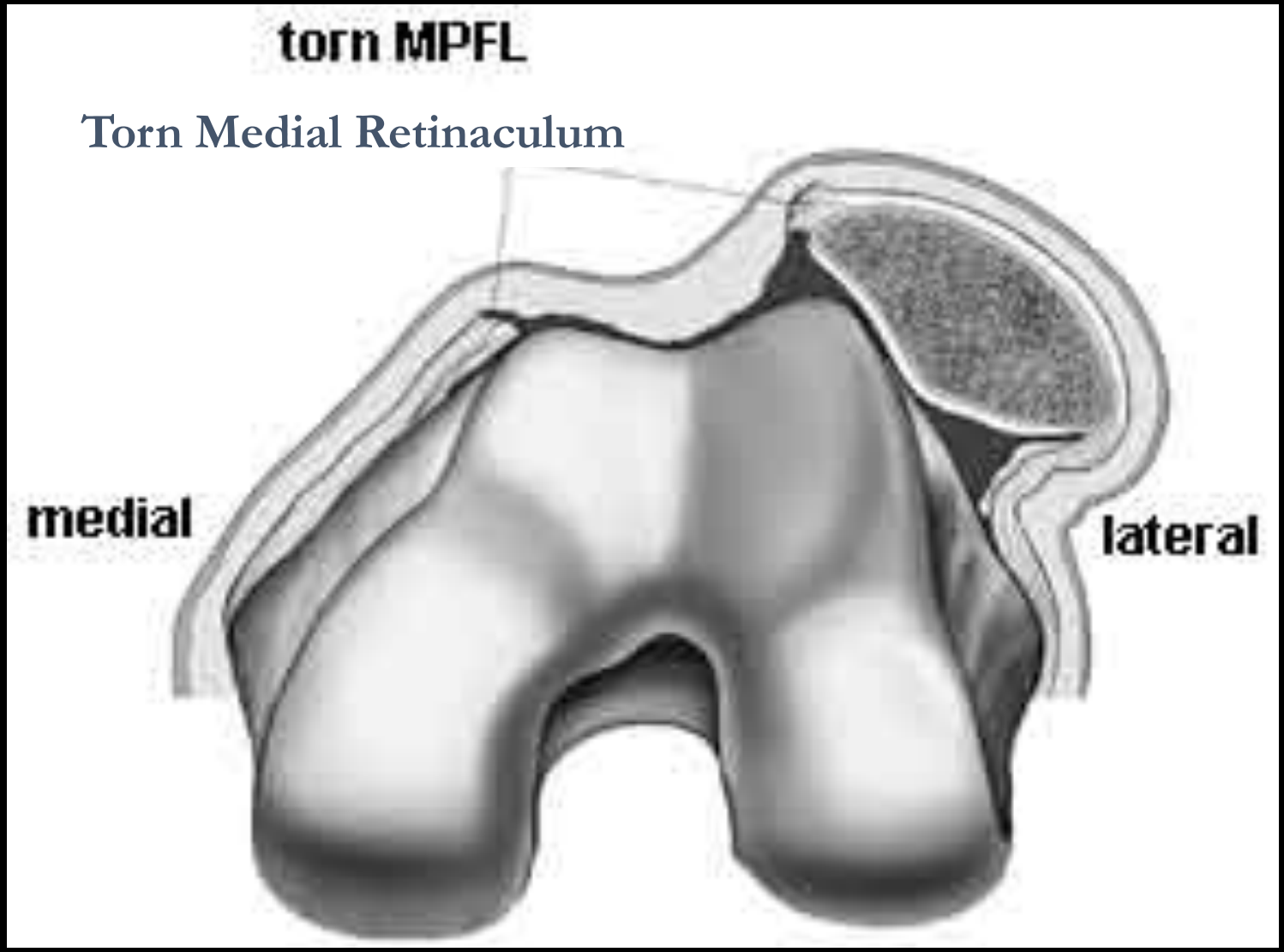
Case

- 17 yo girl, soccer
- Acute, non-contact, twisting injury
- Patella noted dislocated
- Brought by ambulance to ER for reduction
- Placed in immobilizer, crutches

Knee Exam

- Inspection- Large effusion, **deformity**
- ROM- **Limited by pain and swelling**
- Palpation- **Tender over medial retinaculum**
- Neurovascular- Intact
- Special maneuvers-
  - **Positive patellar apprehension**

Patellar Dislocation



MRI

Patellar Dislocation: Role of MRI Imaging

- Osteochondral injury
- High grade medial patellar stabilizer disruption
- Associated injury (e.g. ACL)

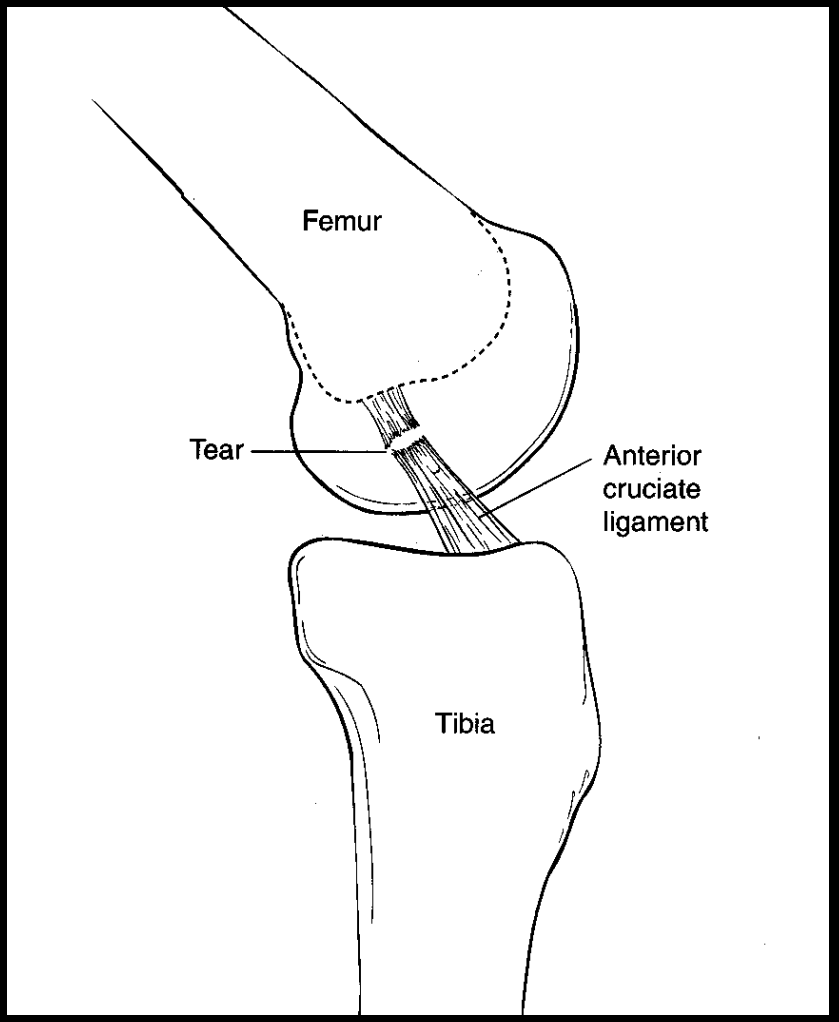
Patellar Dislocation

- If MRI negative, PRICEMMM
  - Progressive Rehabilitation
  - Knee bracing (immobilizer 1-2 weeks)
  - RTP 6-8 weeks
- If MRI positive-Early arthroscopy

Case

- 16 yo female soccer player, felt a “pop” in right knee after twisting injury
- Collapsed, could not ambulate
- Swelling immediately

Diagnosis
Presumed ACL Rupture



Tx ACL Rupture

- Radiographs to eval for fracture
- PRICEMMM
- Knee Immobilizer for comfort
- Rehab to begin after pain improved
- Referral for surgical consultation

MRI

NORMAL

RUPTURE

Case

- 15 yo wrestler, acute twisting knee injury while opponent driving him into the mat
- Knee flexed at the time of injury
- Rapid onset swelling and pain

Knee Exam

- Inspection- **Moderate intra-articular effusion**
- Palpation- **Diffuse tenderness, max pain over medial joint line**
- ROM- Limited flexion
- Neurovascular- Intact
- Special maneuvers- Deferred

Joint Line Palpation

Imaging

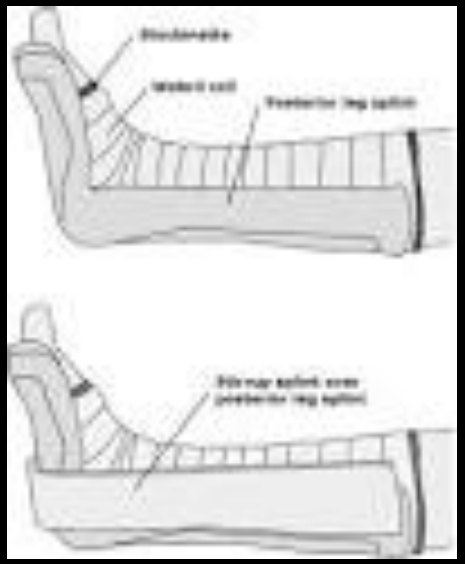
Tx Meniscal Tear

- PRICEMMM
- Knee Immobilizer for comfort
- Rehab to begin after pain improved – goal is to have increased ROM and minimal effusion
- Referral for surgical consultation

Knee Braces…

More braces…

Splints



Conclusions

- >90% of pediatric sports medicine injuries are encompassed by PCSM
- Critical to prescribe timely rehabilitation
- Identify your RED FLAGS for MRI/referral

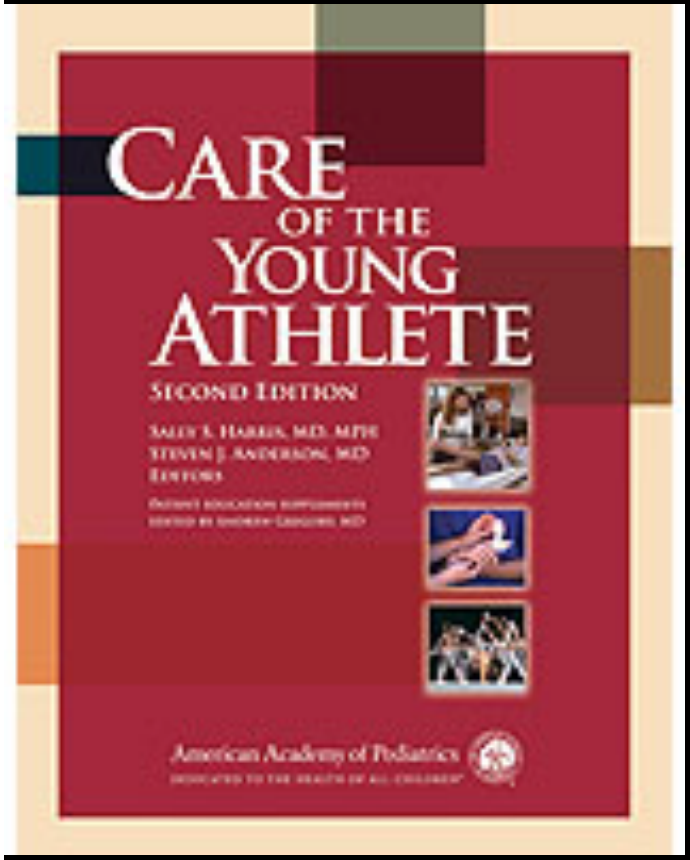
Sports Medicine Referrals

- EMR order: PEDIATRIC Sports Medicine
- Order Multiple view X-rays if ANY indication
- Acute injuries: (Fx, TBI, MSK) same day/week
- Chronic/Overuse injuries:1-2 weeks
- Exercise Rx 2-4 weeks

Thank You

Mo Mortazavi, MD
Pediatric Sports Medicine

Great PCSM References



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