Emory Sports Medicine
Injuries in Soccer 2018

Emergency Evaluation of
The Downed Athlete

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High Anxiety for SM Team Athlete Collapse

SCA with Sentinel Seizure

IS THERE A DOCTOR ON THE SIDELINE ??

- Athlete Collapse – SCA
- Commotio Cordis
- Head and Neck Trauma
- Second Impact Syndrome
- Heat Stress EHS
- Sickle Cell Trait – Explosive Rhabdo
- Exercise Induced Asthma
- Allergic Reaction - Anaphylaxis
- Torso Trauma – Chest and Abdomen
- Limb Threatening Joint Dislocations

Top 10 Catastrophic Athlete Injuries

Downed Athlete
Worse-case Scenario??

On The Field Collapse
Worse-case Scenario??

2007 NATA Position Paper
SCA in Athletes Summit (Courson, Drezner)

- Most cases occur with Basketball, Football and Little League Baseball
- 9 to 1 Male/Female
- ➢ Athlete Collapse – Suspect SCA
- ➢ Sentinel Seizure awareness
- AED's with time to shock < 4 minutes
- Coach AED certification
- ➢ Schools need a formal Emergency Action Plan
- Rapid ACLS availability

AED's in Sudden Cardiac Arrest

- Survival
  - Overall: 71%
  - When shock delivered onsite: 87%
  - AED onsite: 80%
  - AED brought by offsite EMS: 50%
  - **Schools with EAP**: 79%
  - **Schools without EAP**: 44%

"The single greatest factor affecting survival from SCA is the time interval from cardiac arrest to defibrillation."

Drezner JA, et al. BJSM 2013

2010 AHA GUIDELINES

ABC now Reversed

CAB

SCA – ROSC

Survival Hospital D/C

2010 AHA Guidelines

- **PUSH HARD**
- **PUSH FAST**

SPORTS ARENA SCA
Current Best Practice

- WHEN TO SHOCK FIRST
- CPR FIRST
- CONTINUE CPR AFTER SHOCK
- TIMING OF RESCUE BREATHING
- DELAYED SCA WITH ECAST
- SCHOOL SCA **ADULTS** > ATHLETES

Head Impact
Worse-case Scenario??

International Symposia on Concussion in Sport

- First ISC **Vienna** 2001
- Second ISC **Prague** 2005

  Simple vs Complex, SCAT2 sideline tool
- Third ISC **Zurich** 2008

  Removed Simple vs Complex grading,

  RTP based on progression
- Fourth ISC **Zurich** 2012 – SCAT3, Baseline NP, BESS, enhanced MRI
- Fifth ISC – **Berlin** 2016 – SCAT 5 – RTL, "Rest"

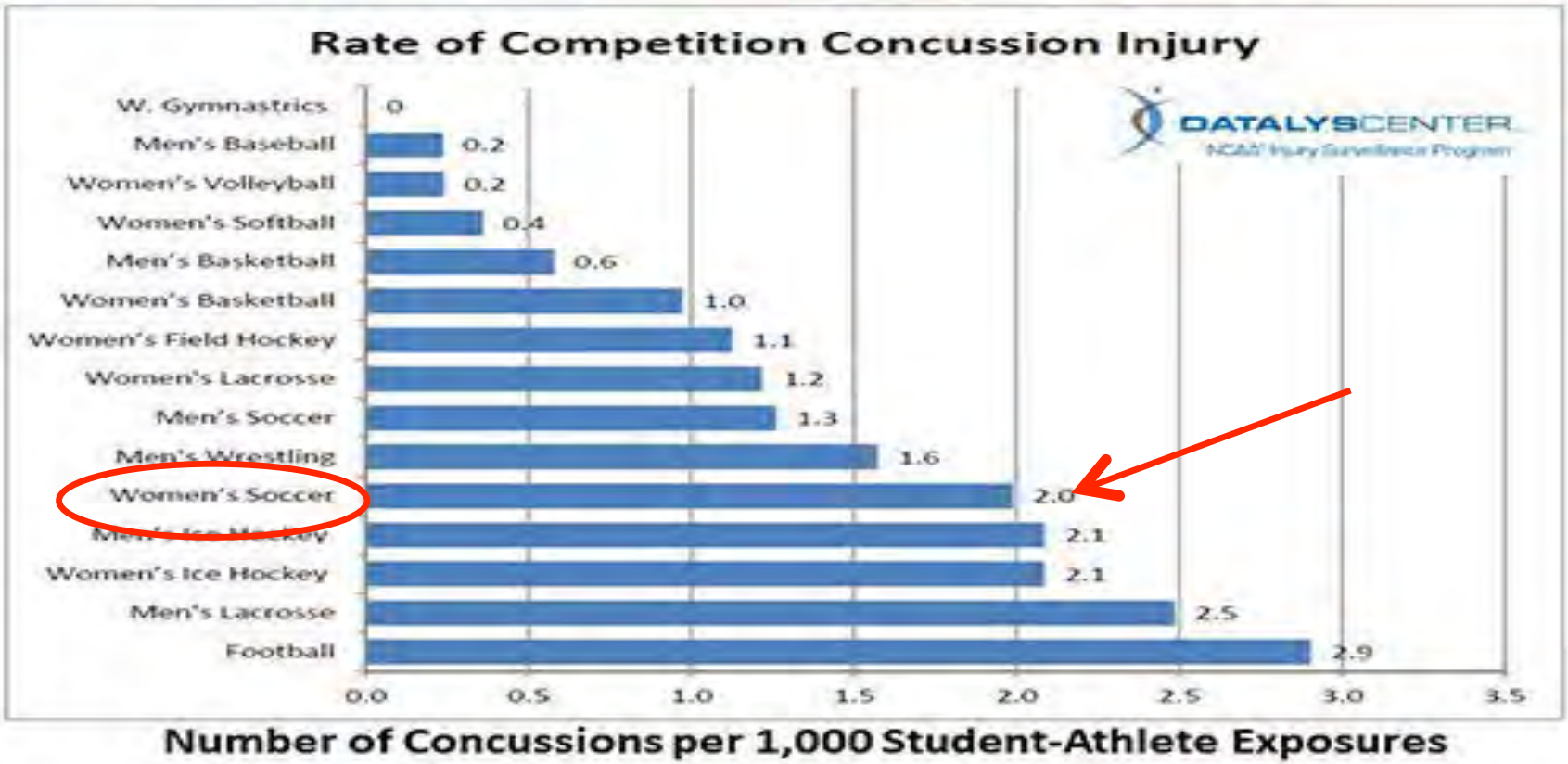
FIFA, IOC, IIHA

Sports Concussion

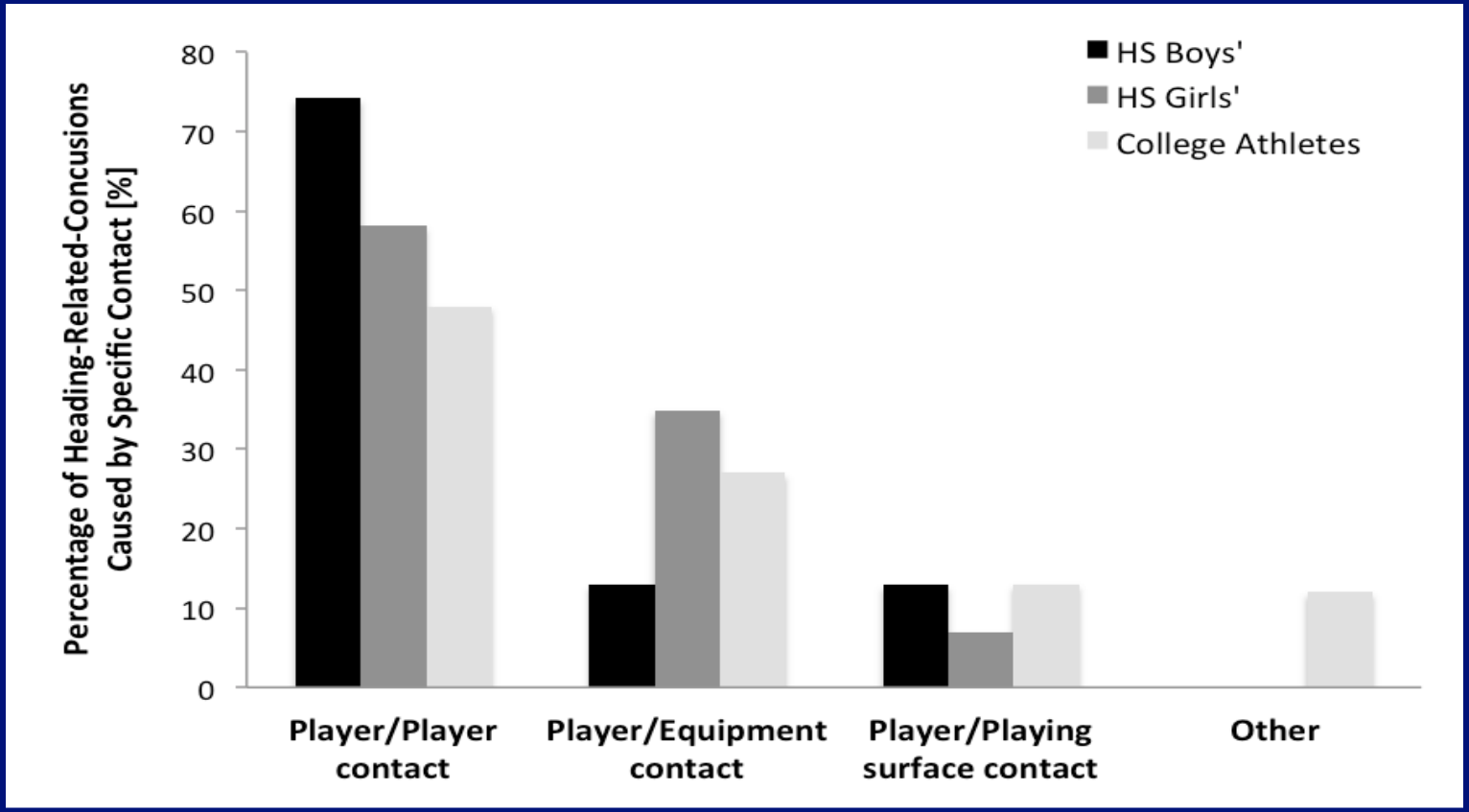
- **NFL** - 2012 Independent Physician for RTP
  Media – Early Dementia, CTE
  2013 Sideline Independent Neuro Exam
- **College** – Neuro-Cognitive test Pre-Season
  Repeat Post-Injury; "Targeting" rule change,
  Medical Time Out - NATA
- **High School** - **50 States with RTP Legislation**
  Pre-Season Video, Second Impact Syndrome
- **Youth** - CDC Coach / Parent Video
  ^ In Emergency Department visits
  2015 Youth Soccer Heading restrictions USSF

Concussion in Soccer

Figure 1. Rate of Competition Concussion Injury



Soccer Concussion Contact Type



Head to Head

Head to Post

Head to Ground & Other

Soccer RTP Concussion

Soccer Concussion Symptoms

1. Headache
2. Dizziness
3. “Foggy”
4. Confusion
5. Light sensitivity
6. Noise sensitivity

USSF RTP Protocol

- Post Acute Evaluation and Management
  - Symptom free
  - **Neurocognitive**
  - Gradual progression
    - Symptom free x 24 hours
    - Symptoms re-emerge begin with previous step after being symptom free x 24 hours
    - Athlete should only progress to next level when instructed to by team ATC or MD

USSF RTP Protocol

- Graded RTP: Based on Prague Guidelines
  - 1. Rest until asymptomatic x 24 hrs.
  - 2. Light aerobic exercise
  - 3. Moderate intensity aerobic exercise
  - 4. Sport specific training drills (**No Heading**)
  - 5. Non contact training drills, including full exertion interval training
  - 6. Begin heading training steps 1&2
  - 7. Full contact training with heading steps 3&4
  - 8. Return to competition

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Youth Soccer

- 50,000 High School Concussion 2010
- 2015 US Soccer position statement:

  Age 10 and under - **No Heading**

  Age 11-13 - Limit **Heading in practice**

Protective Equipment

Q30 Collar Concussion Protection

- 2015-16 Saint Xavier HS Football Cincinnati
- 2016 Seton High School Girls Soccer
- Dr Julian Bailes, Chairman Neurosurgery, North Shores Hospital
- Reduce the brain slosh/slide with rapid acceleration and deceleration
- Woodpecker “Inspired”

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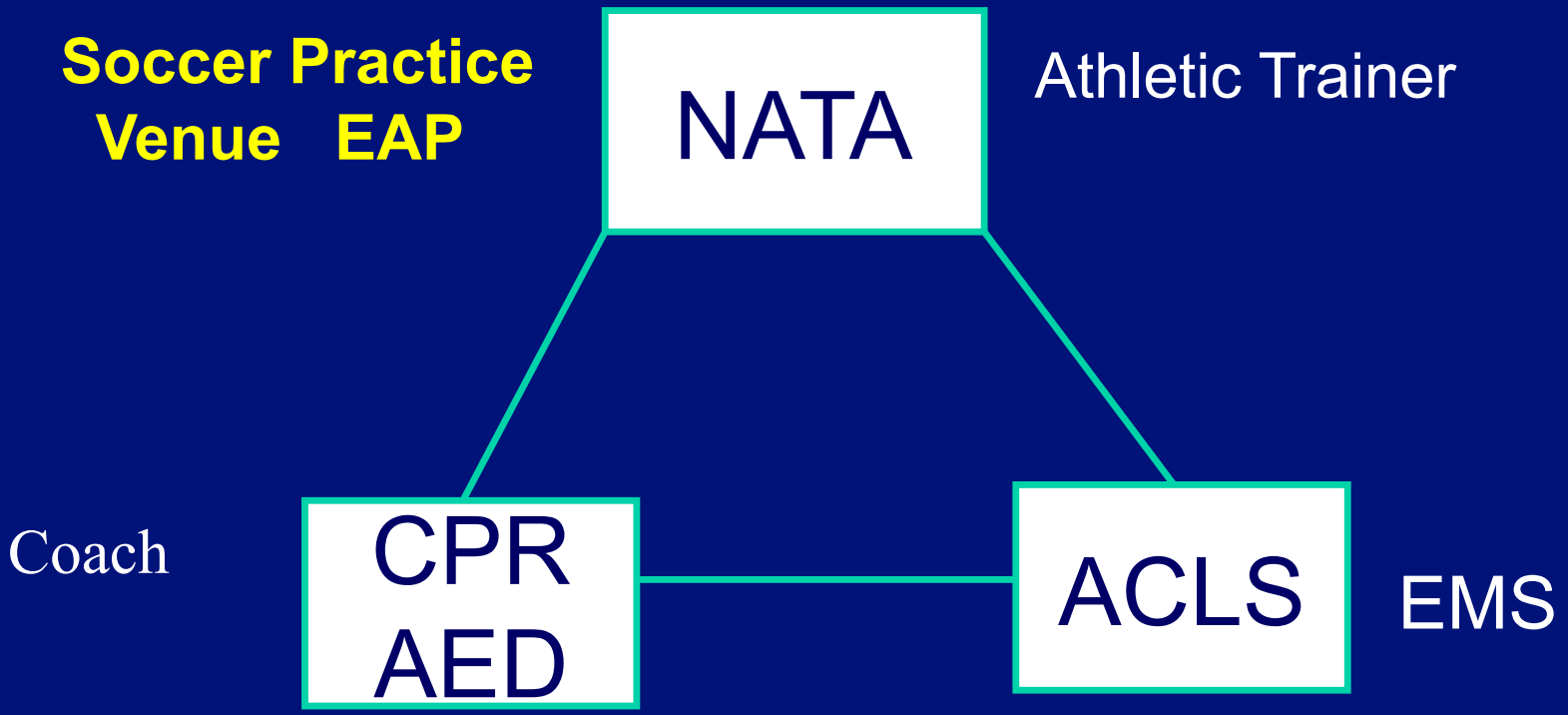
Sports Trauma
Athletic Trainer/ Coach Teamwork



Rule of 100

Sports Trauma Management

Sports Trauma Decisions

Rule of 100

Initiate VS trending if:

Pulse > 100

or

Temperature > 100

or

Systolic BP < 100

VST - Sport Trauma
EMS-ATC Focus

- Initial Vital Signs
- Rule of 100
- Vital sign Trending
  - Heat stress
  - Unconscious athlete
  - Asthma attack
- Pearls and "When to Worry"
- Sideline Gadgets

Atlanta 1996
Sports Trauma Decisions

Rule of 100

Initiate VS trending if:

Pulse > 100

or

Temperature > 100

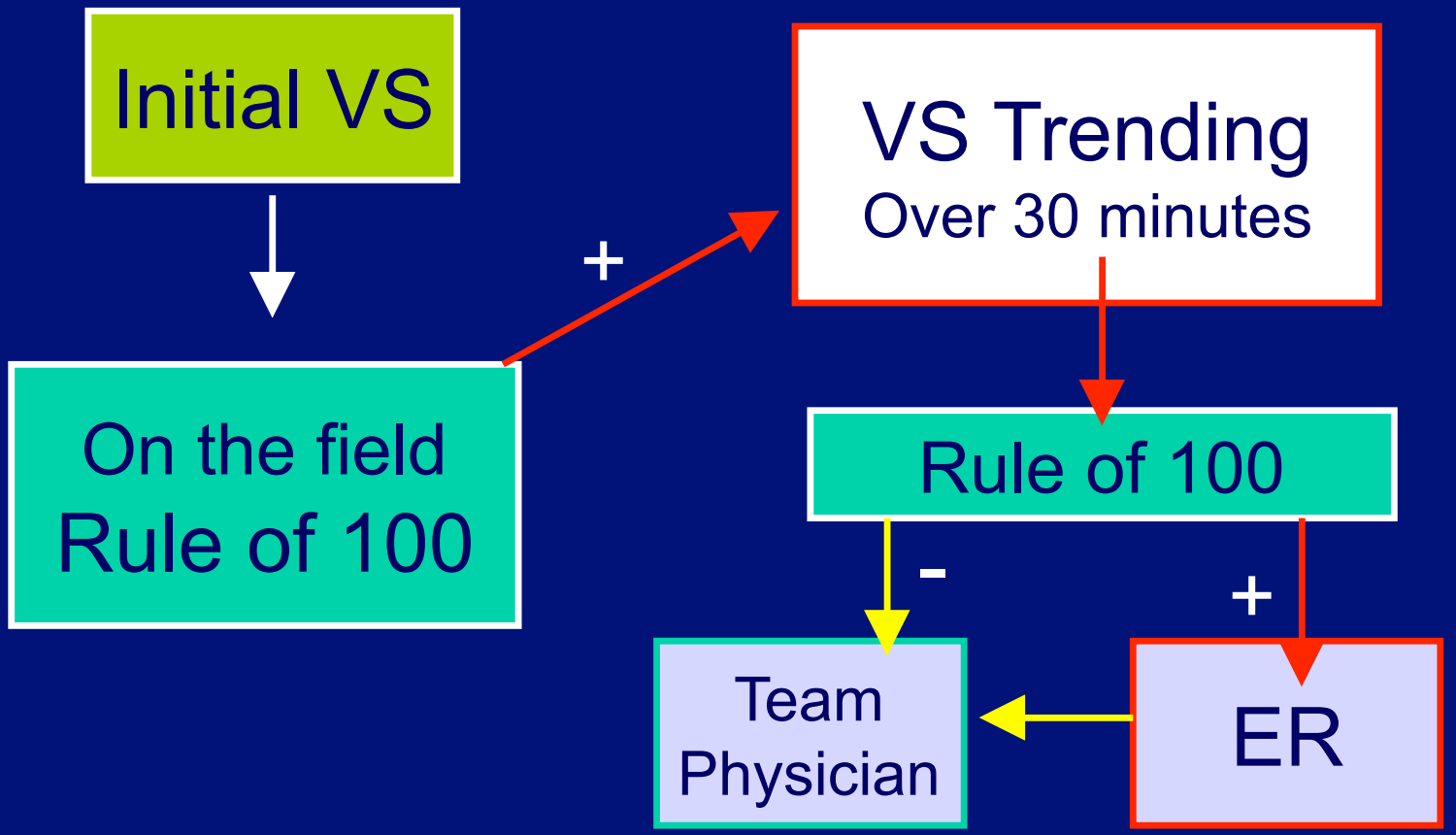
or

Systolic BP < 100

VS Trending

- Serial vital signs over 30 mins
- monitor heart rate, BP and temp
- response to rest, hydration, cooling, and other interventions

Sports Trauma VS Trending



Heart Rate Trending

Tachycardia: Heart rate > 100

- Sinus Tachycardia
- Supra-ventricular (SVT)
- Ventricular (VT)

"sports tachycardia" - sinus tachycardia response from exercise

Heart rate Trending

Sports Tachycardia Pearl

- Sinus tachycardia from vigorous sports play improves over 15 minutes in most cases
- Persistent tachycardia is cause for concern Rule out hemodynamic instability
- Cardiac monitoring will determine if supra-ventricular or ventricular tachycardia is present

Sideline Gadgets

- Peak Flow Meter
- Digital Thermometer
- Pulse Oximetry

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Sideline Medications & Resuscitation Equipment

- Albuterol Inhaler
- Epinephrine
- Benadryl

- AED
- Bag-Valve Mask
- King Airway

Sports Trauma: Coach, EMS, Athletic Trainer Teamwork

Greenbrier Sports Performance Center

Rural High School Limited Sp Med Talent

Medical Time Out

The Kyle Group

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2018 ED Sport Concussion  Shift

- Most Sports Concussions without LOC
- CTE risk for repetitive sub-concussive Hits
- After First Concussion 3-6X risk second (SIS)
- Defer RTP decision
- Consider risk stratification for PPCS
- Prescribe Neuro-Cognitive testing and symptom checklist
- Offer RTL & RTA advice , Magnesium 400mg
- Expect Biomarker testing to confirm in future

The Kyle Group

ED Discharge Checklist (GSC)

Graded Symptom Checklist (GSC)

Symptom	Time of injury	2-3 Hours postinjury	24 Hours postinjury	48 Hours postinjury	72 Hours postinjury
Blurred vision					
Dizziness					
Drowsiness					
Excess sleep					
Easily distracted					
Fatigue					
Feel "in a fog"					
Feel "slowed down"					
Headache					
Inappropriate emotions					
Irritability					
Loss of consciousness					
Loss or orientation					
Memory problems					
Nausea					
Nervousness					
Personality change					
Poor balance/ coordination					
Poor concentration					
Ringing in ears					
Sadness					
Seeing stars					
Sensitivity to light					
Sensitivity to noise					
Sleep disturbance					
Vacant stare/glassy eyed					
Vomiting					

NOTE: The GSC should be used not only for the initial evaluation but for each subsequent follow-up assessment until all signs and symptoms have cleared at rest and during physical exertion. In lieu of simply checking each symptom present, the ATC can ask the athlete to grade or score the severity of the symptom on a scale of 0-6, where 0=not present, 1=mild, 3=moderate, and 6=most severe.

Emergency Department Predictors
PPCS @ 1 Month

Patient History

1. Age 13-18
2. Sex Female
3. Prior Concussion
4. Migraine Hx

Emergency Dept Findings

5. Answer Slow in ED
6. BESS test tandom 4*
7. Sensitivity to noise
8. Headache
9. Fatigue

Zemek, R: *JAMA* March 8, 2016
3063 Pediatric age 5-17, 30% PPCS

Community "Best Practice" Sports Concussion

- **Emergency Room**: Head, C-spine evaluation- ?CT
  BESS Testing, 72hr **GSC** at D/C
- **Pediatrician**: Review Graded Symptom Checklist
  Neuro-Cognitive testing (ImPACT)
- **School/ Coach**: Equipment check, 5 day progression
  Consult Physician RTP