

# **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

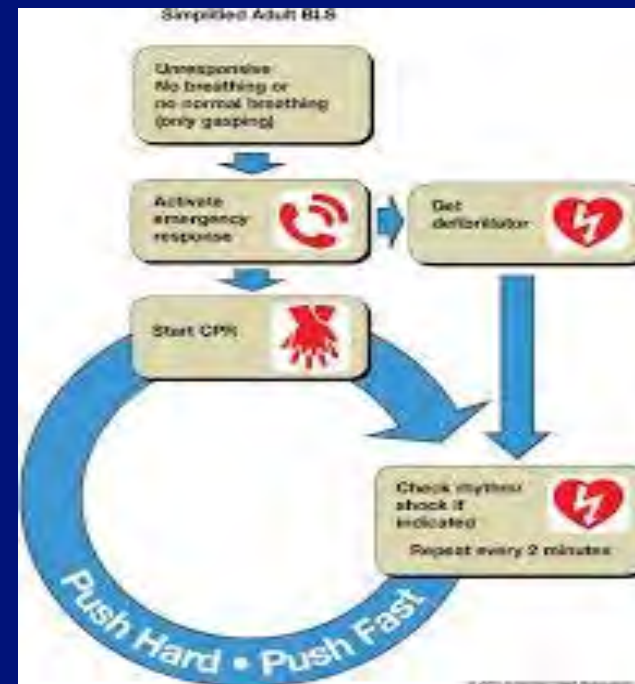
- Survival
  - Overall: 71%
  - When shock delivered onsite: 87%
  - AED onsite: 80%
  - AED brought by offsite EMS: 50%
  - **Schools with EAP: 79%**
  - **Schools without EAP: 44%**

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

# 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”

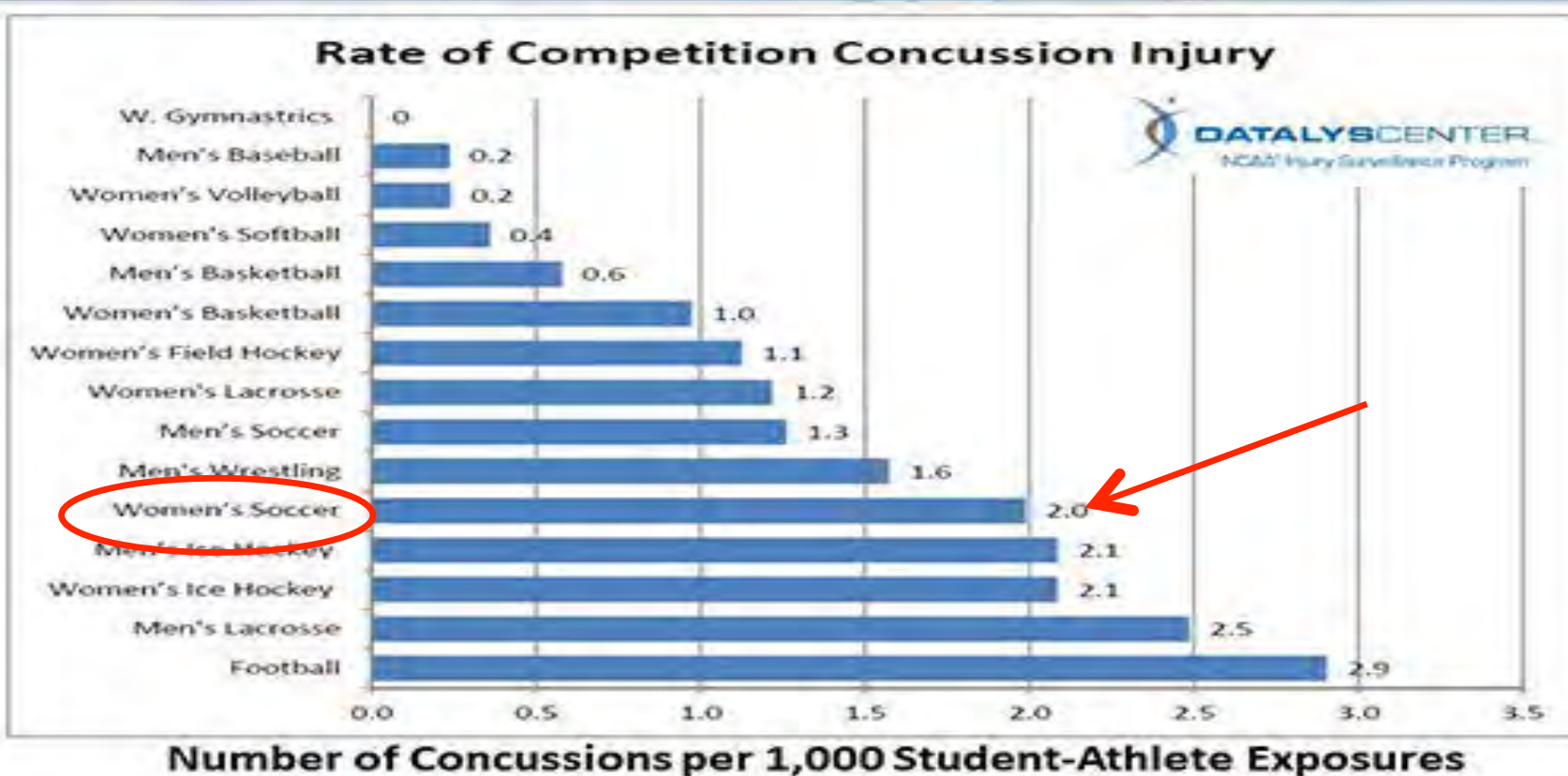
FIFA, IOC, IIHA

# Sports Concussion

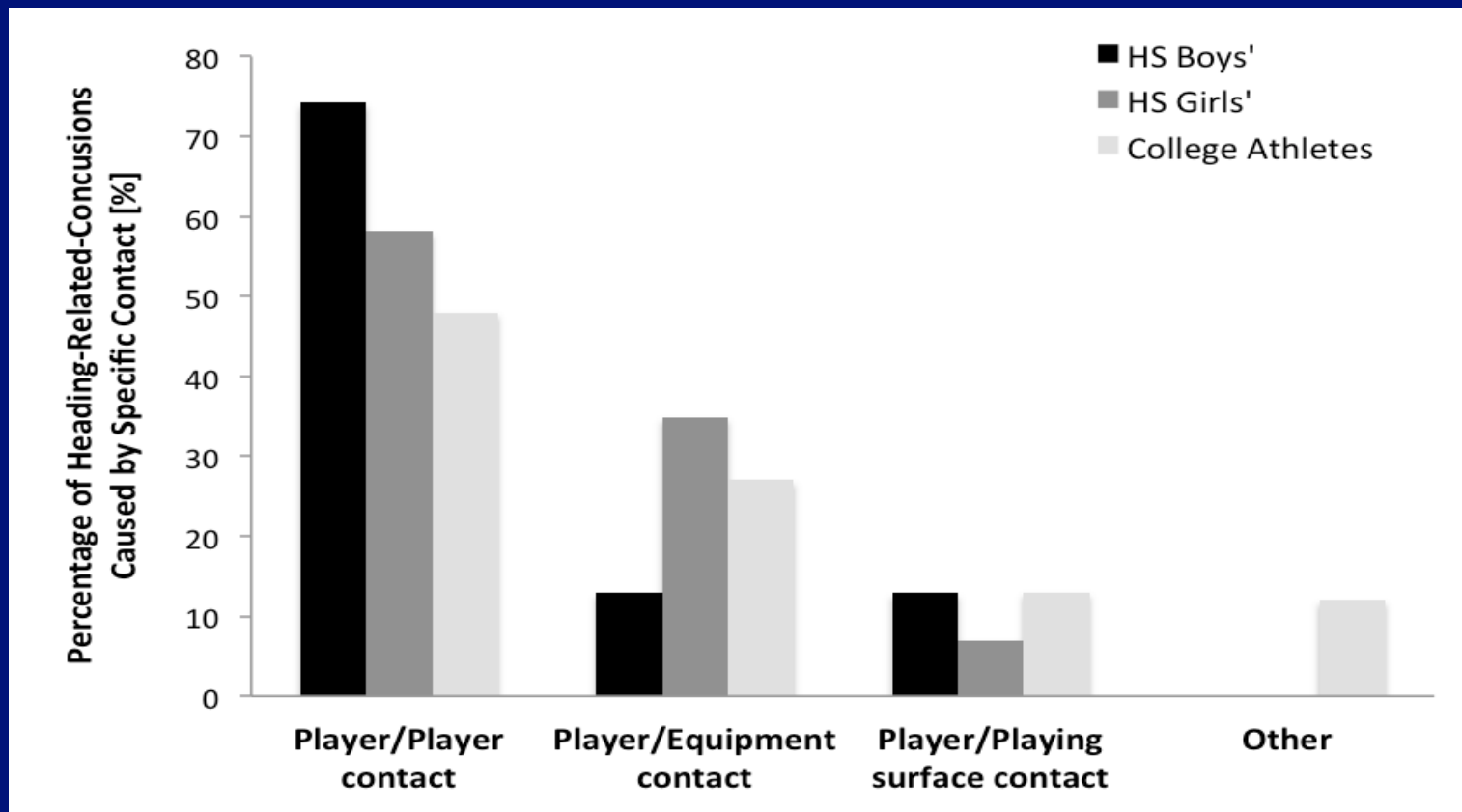
- **NFL** - 2012 Independent Physician for RTP  
Media – Early Dementia, CTE  
2013 Sideline Independent Neuro Exam
- **College** – Neuro-Cognitive test Pre-Season  
Repeat Post-Injury; “Targeting” rule change,  
Medical Time Out - NATA
- **High School** - **50 States with RTP Legislation**  
Pre-Season 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

# Sports Concussion

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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”

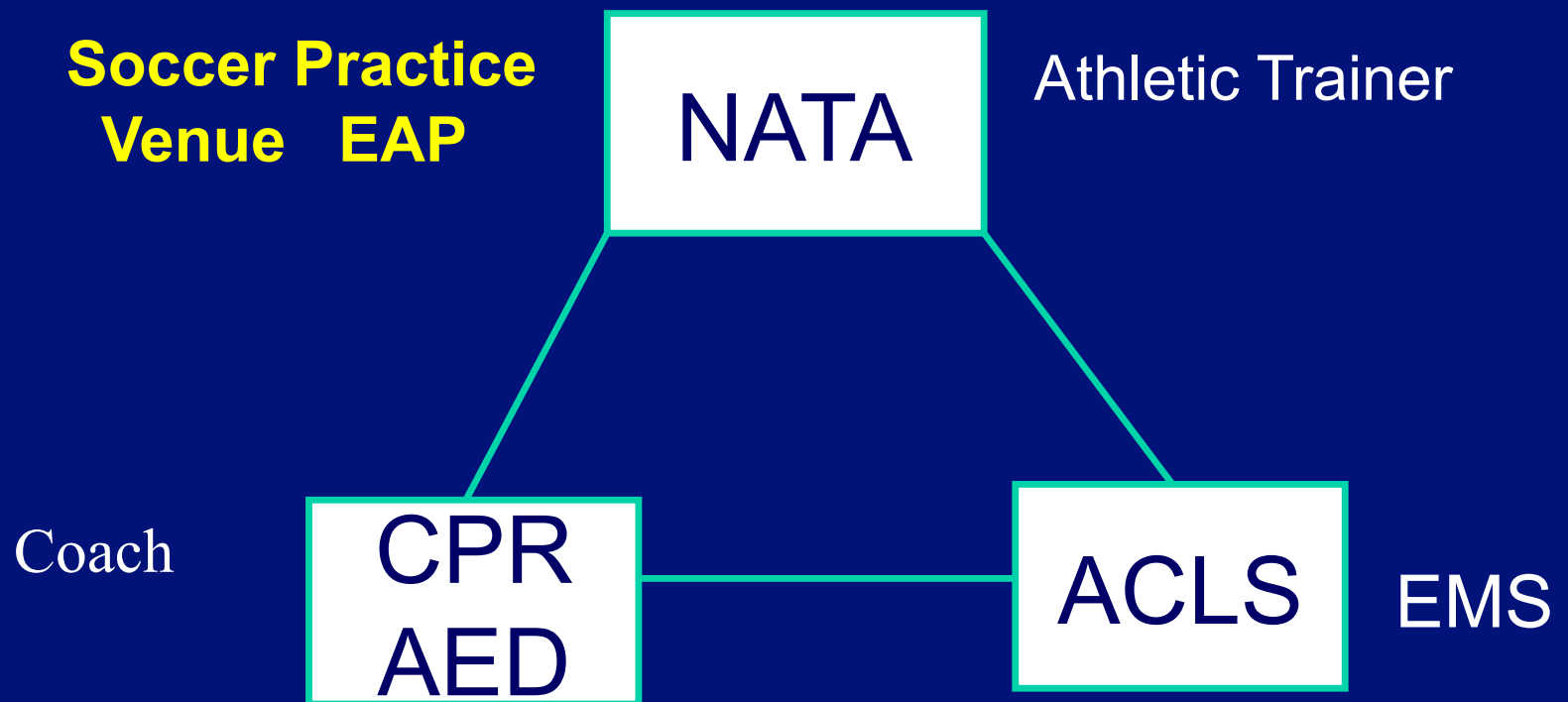
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# Sports Trauma

## 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**

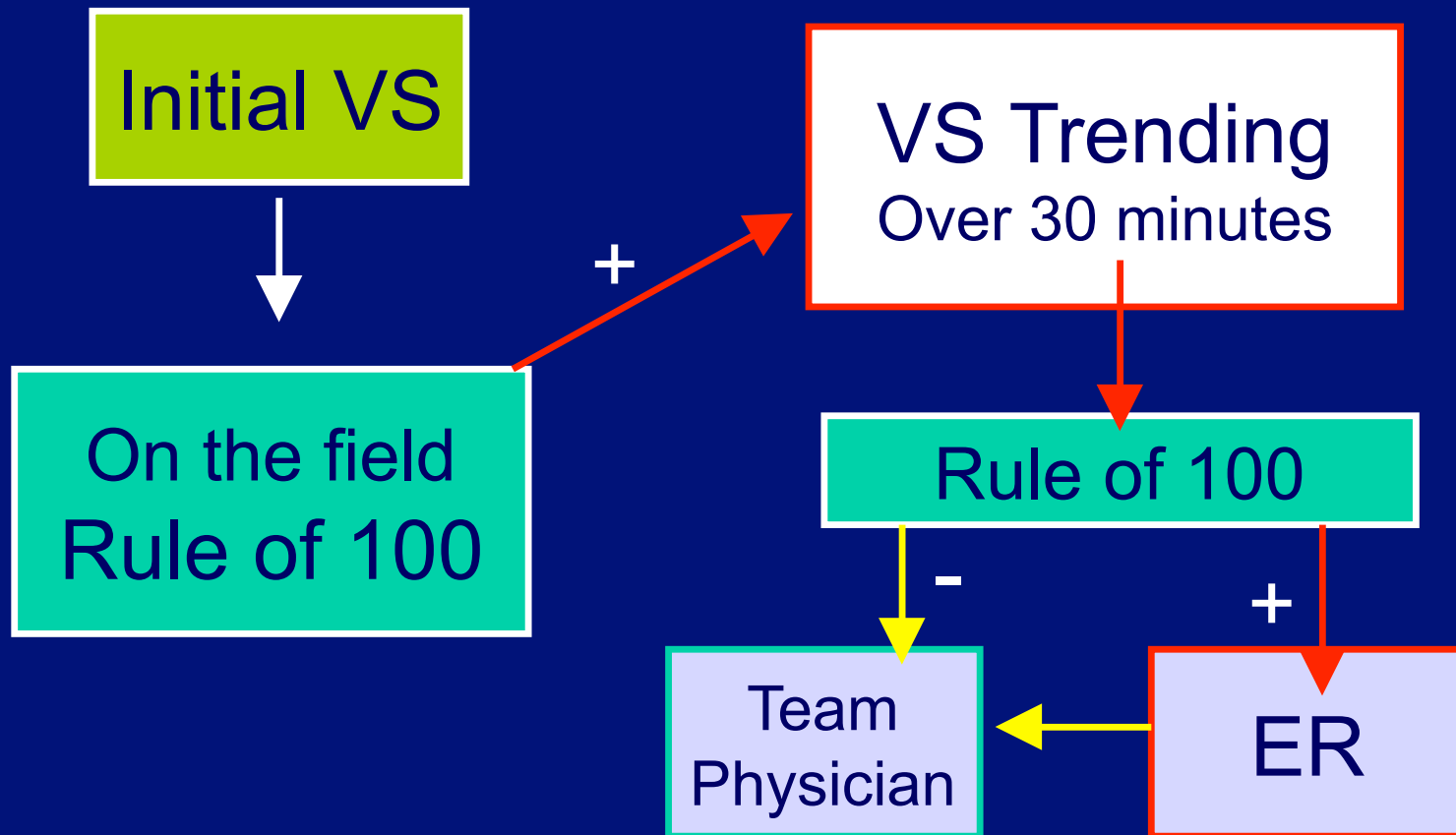
or

**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



**FRIDAY NIGHT  
MEDICAL TIME OUT** CHECKLIST

Review this checklist before any athletic event.

<input type="checkbox"/> AED/EMS	EMS Contact Name	
<input type="checkbox"/> AED Location	EMS Contact Number	
<input type="checkbox"/> Injured Person's Name	Backup EMS Name	
<input type="checkbox"/> Backboard	Backup EMS Number	
<input type="checkbox"/> First Aid Kit	Signal Name	
	Signal Number	

Home Team Physician Name		Home Athletic Trainer Name	
Home Team Physician Cell		Home Athletic Trainer Cell	
Visitor Team Physician Name		Visitor Athletic Trainer Name	
Visitor Team Physician Cell		Visitor Athletic Trainer Cell	

Hand Signals	Choking Injury Response
AED Use Field	<input type="checkbox"/> EMS
Backboard Position	<input type="checkbox"/> Student Athlete Name
Concussion	Spectator Short Response Plan
	Neurological Land Zone
	Fire Department
	Police Department

*The Kyle Group*





# 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





# ED Discharge Checklist (GSC)

<u>Graded Symptom Checklist (GSC)</u>					
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 of 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