CSN Children's Safety Network

at Education Development Center

February 21, 2019

Traumatic Brain Injury among Children and Youth: Understanding TBI and One Model State Program

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Tech Tips

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Use the Q & A to ask questions at any time

Download resources from File Share pod

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This session is being recorded

Concussion 101

Massachusetts Concussion Management Coalition

Science, education, and community working together to prevent and manage concussions

Diane Sartanowicz MS, LAT, ATC

Director

Objectives

Traumatic brain injuries(TBI's) and concussions

Define concussion

Diagnosing a concussion

Examination, testing, imaging

Prognosis/Outcomes of concussions

Prevention

TBI's

- Traumatic brain injury represents 30% of all injury deaths
- Every day, 153 people in the USA die from injuries that include TBI
- Most TBIs are mild "concussions"
- 7-13% of patients with concussions develop post concussive syndrome

Taylor CA, CDC 2017

TBI-Related Hospital Visits

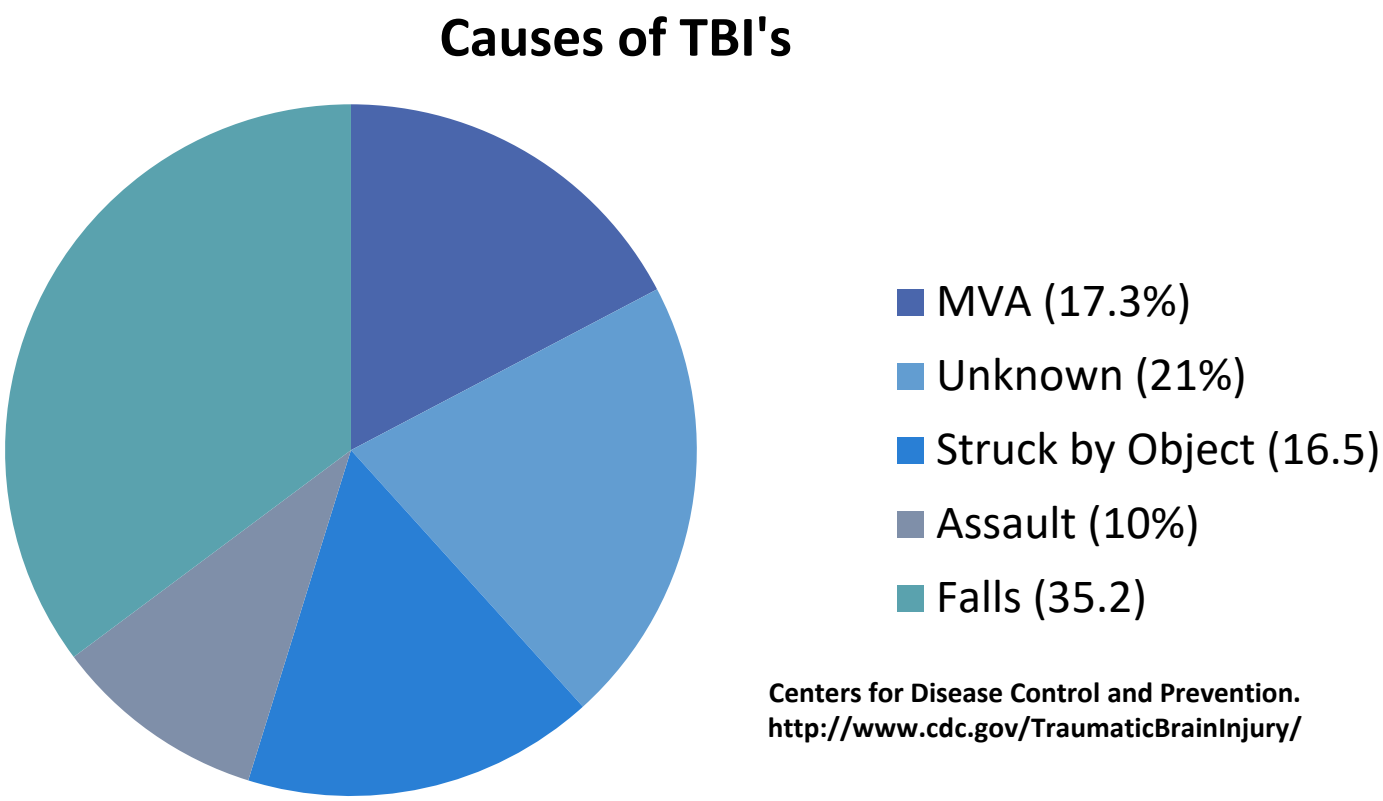
CDC Reports:

- 2.5 Million Emergency Department Visits
- 282,000 TBI-Related Hospitalizations

This represented approximately 1.9 % of all hospital emergency room and hospital admissions during the year 2013.

Taylor CA, CDC 2017

Not Just for Sports…



Centers for Disease Control and Prevention.
http://www.cdc.gov/TraumaticBrainInjury/

Defining Concussion

5th International Conference on Concussion in Sport

"Traumatic brain injury induced by biomechanical forces"

- Direct blow to head/face or "impulsive" force transmitted
- Usually rapid onset of short-lived impairment of neurologic function that resolves spontaneously
  - May develop over minutes to hours
- Acute symptoms reflect functional rather than structural injury
  - No abnormality on standard structural neuroimaging is seen
- Range of clinical signs and symptoms may or may not involve LOC
  - Resolution of the clinical and cognitive features typically follows a sequential course

Diagnosing Concussion

Scenarios:

1. Often easy:
   - identifiable injury with immediate onset of symptoms
2. Many are much more difficult:
   - Multiple smaller hits
   - Delayed symptom onset
3. Most difficult:
   - Collection of “new” sxs without identifiable injury
   - Symptoms retroactively assigned to “injury”

Sideline Assessment

SCAT5©

SPORT CONCUSSION ASSESSMENT TOOL – 5TH EDITION

DEVELOPED BY THE CONCUSSION IN SPORT GROUP

FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by

STEP 1: RED FLAGS

RED FLAGS:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/ burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

STEP 2: OBSERVABLE SIGNS

Witnessed ☐ Observed on Video ☐

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N

STEP 3: MEMORY ASSESSMENT MADDOCKS QUESTIONS[2]

"I am going to ask you a few questions, please listen carefully and give your best effort. First, tell me what happened?"

Mark Y for correct answer / N for incorrect

What venue are we at today?	Y	N
Which half is it now?	Y	N
Who scored last in this match?	Y	N
What team did you play last week / game?	Y	N
Did your team win the last game?	Y	N

Sideline Assessment

STEP 4: EXAMINATION
GLASGOW COMA SCALE (GCS)[3]

Time of assessment			
Date of assessment			
Best eye response (E)			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
Best verbal response (V)			
No verbal response	1	1	1
Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5
Best motor response (M)			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6
Glasgow Coma score (E + V + M)			

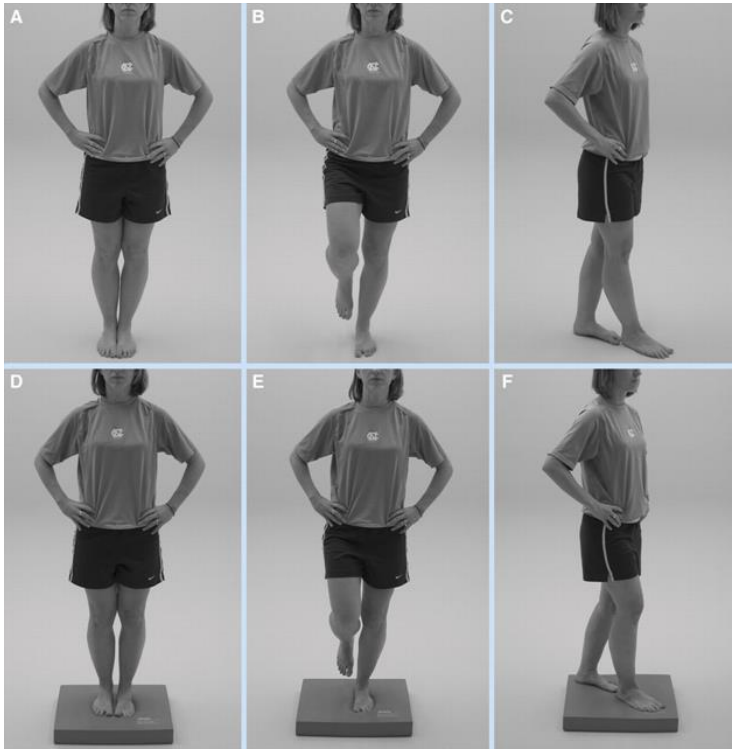
CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is NO neck pain at rest, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

BESS (modified BESS)

Procedure

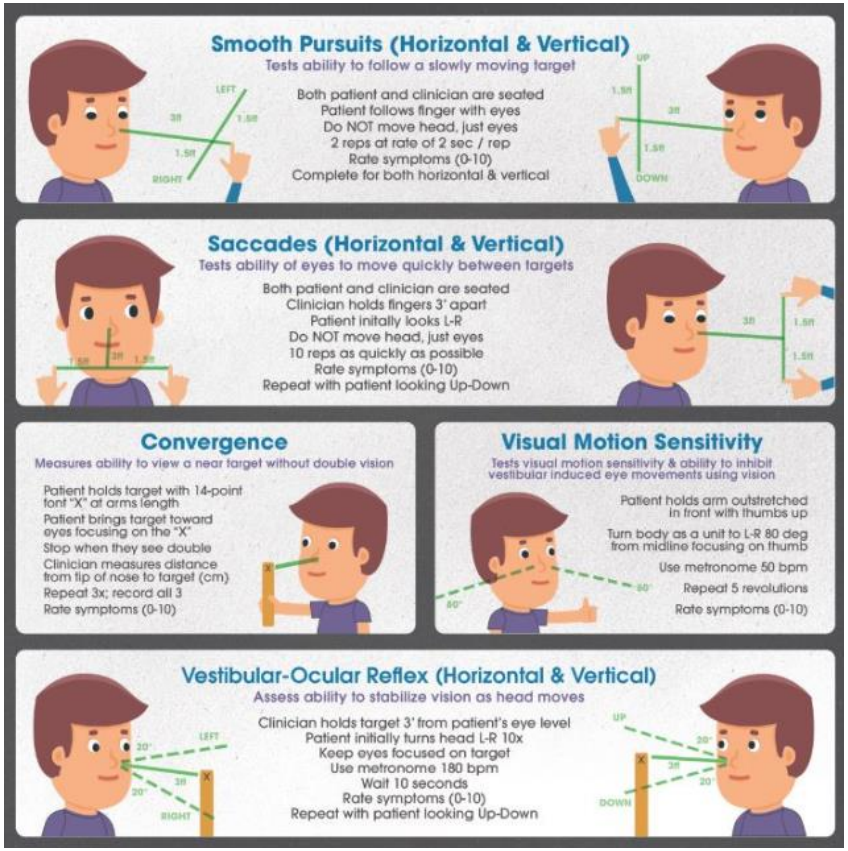
- 3 stances (firm, foam)
  - Double leg
  - Single leg (non-dominant)
  - Tandem (non-dominant in back)
- 20 second holds
- Count the number of errors



Errors

- Opening eyes
- Removing hands from the iliac crest
- Stepping or falling out of position
- >30 degrees of hip abduction or flexion
- Lifting the forefoot or heel
- Remaining out of position > 5 seconds

VOMS



Vestibular/Ocular-Motor Screening (VOMS) for Concussion

Vestibular/Ocular Motor Test:	Not Tested	Headache 0-10	Dizziness 0-10	Nausea 0-10	Fogginess 0-10	Comments
BASELINE SYMPTOMS:	N/A					
Smooth Pursuits						
Saccades – Horizontal						
Saccades – Vertical						
Convergence (Near Point)						(Near Point in cm): Measure 1: _____ Measure 2: _____ Measure 3: _____
VOR – Horizontal						
VOR – Vertical						
Visual Motion Sensitivity Test						

Examination

Impact site: local trauma, contusion

General interaction
- Responsiveness, mood, affect, speech patterns

Cervical Evaluation
- Bony and soft tissue tenderness, ROM

Neurologic exam
- SCAT5
- CN II-XII, reflexes
- Romberg, Finger-to-nose testing
- Extremity strength
- Balance testing (modified BESS)
- VOMS testing

Almost always completely normal

Subjective Symptom Scale

(Please choose only ONE number for each symptom)

Headache Symptoms	None	Mild	Moderate	Severe
Headache	0	1 2	3 4	5 6
"Pressure in head"	0	1 2	3 4	5 6
Neck pain	0	1 2	3 4	5 6
Nausea or vomiting	0	1 2	3 4	5 6
Sensitivity to light	0	1 2	3 4	5 6
Sensitivity to noise	0	1 2	3 4	5 6

Vestibular Symptoms	None	Mild	Moderate	Severe
Balance problems or dizziness	0	1 2	3 4	5 6
Hearing problems / ringing	0	1 2	3 4	5 6
Vision problems	0	1 2	3 4	5 6

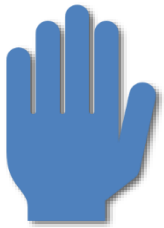
Emotional Symptoms	None	Mild	Moderate	Severe
More emotional than usual	0	1 2	3 4	5 6
Irritable	0	1 2	3 4	5 6
Sadness	0	1 2	3 4	5 6
Nervous or anxious	0	1 2	3 4	5 6

Cognitive Symptoms	None	Mild	Moderate	Severe
Confusion	0	1 2	3 4	5 6
Feeling like "in a fog"	0	1 2	3 4	5 6
Difficulty concentrating	0	1 2	3 4	5 6
Difficulty remembering	0	1 2	3 4	5 6
"Don't feel right"	0	1 2	3 4	5 6
Feeling "dinged" or "dazed"	0	1 2	3 4	5 6

Sleepiness	None	Mild	Moderate	Severe
Feeling slowed down	0	1 2	3 4	5 6
Drowsiness	0	1 2	3 4	5 6
Fatigue or low energy	0	1 2	3 4	5 6
Trouble falling asleep	0	1 2	3 4	5 6
Sleeping more than usual	0	1 2	3 4	5 6

Total PCSS: _____

Management



Danger v.s. How you feel

“Treat Grandma”

Diet
Hydration
Sleep
Light Exertion
Stress

Three central principles

Prevent new injury

Minimize school interruption

Prevent deconditioning

- (physical, social, psychological)

Use of Imaging

Uncommon to require imaging in concussion

- Useful only for finding structural changes

CT Scans

- Loss of consciousness at time of injury
- Obvious neurologic deficit at initial exam

MRI

- May be used in prolonged symptoms (>4 weeks)

ImPACT Testing

12yo+
- Pediatric ImPACT 5-11yo

Significant limitations
- Baseline setting/effort

Overutilized as a “status report”
- Ideal use is for clearance, when symptom free

Does NOT diagnose or clear on its own

Prognosis

CDC's Newest Predictive Numbers (positive) Centers for Disease Control and Prevention Guideline on the Diagnosis and Management of Mild Traumatic Brain Injury Among Children

- 70% - recover in 1 month
- 90% - recover in 3 months
- 95% - recover in 1 year

Predictors of longer symptoms (> 4 weeks)

- Previous concussion history
- Previous anxiety/depression/ADHD
- Personal or family history of headaches/migraines
- Cognitive/"Foggy" feeling as worst symptoms
- Multiple collisions before removed (vs single blow)
- Females > males; High School > Professional

Repeat Concussions

Athletes with history of concussion (Guskiewicz, JAMA 2003)

*1 injury = 1.5x risk for repeat concussion

*2 injuries = 2.8x risk for repeat concussion

*3+ injuries = 3.5x risk for repeat concussion

How Many is Too Many?

No known answer – likely will never have one

- 2 in same season, recommend done for season

Varies based on age, level, future, etc.

- Acceptance of risk…
- Based more on pattern and evidence of cumulative effects

Concussion Prevention

Awareness of incoming injury

Cervical size and strength

Protective gear

At this point, we have no solid evidence that any piece of equipment has significant protection from concussion

- Helmets
- Headbands
- Mouthguards

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- www.cdc.gov/concussion

Thank You

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Safe Stars Initiative

Child Safety Network Webinar

February 21, 2019

Terrence R. Love, MS, CPC

What is Safe Stars?

- Safety recognition program for youth sports organizations
- Collaboration between the Tennessee Department of Health and the Program for Injury Prevention in Youth Sports at Monroe Carell Junior Children's Hospital at Vanderbilt
- Free and voluntary for all youth leagues and schools
- Organizations may achieve Gold, Silver, or Bronze designation

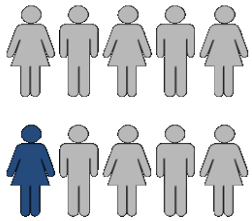
Safe Stars' goal is to standardize safety to protect young athletes

Why Have Safe Stars?

- Nearly 30 million children and adolescents participate in youth sports in the US
- More than 2.6 million children ages 0-19 years are treated in the ER for sports and recreation-related injuries
- In TN, there are approximately 35,000 youth sports-related ED visits each year
- According to the CDC, more than half of youth sports injuries are preventable

Concussion Statistics

An athlete who sustains concussion is **4-6 times** more likely to sustain a second concussion



10% of all contact-sport athletes sustain concussions yearly

Brain injuries associated with football occur at a rate of one in every 5.5 games

5% of soccer players sustain brain injuries

The head is involved in more baseball injuries than any other body part; almost half of injuries involve a child's head, face, mouth or eyes

National Safety Council: https://www.nsc.org/home-safety/safety-topics/child-safety/concussions

Sudden Cardiac Death (SCD)

- **On average, an estimated 66 athletes suffer sudden cardiac cause each year in the United States**
- Sudden cardiac arrest (SCA) is the number one cause of death in the US for student athletes
- One study showed that 72% of students who died from SCA did have a warning sign

http://www.your-heart-health.com/content/close-the-gap/en-US/heart-disease-facts/young-athletes.html

Automated External Defibrillator

Statistics

- Survival rates decrease by 10% with each minute of delayed defibrillation
- 95% of sudden cardiac arrest victims die because of a delayed response
- Early defibrillation is critical in the event of a cardiac emergency
  - Goal: Defibrillate within 3 minutes from the time of collapse to the first shock

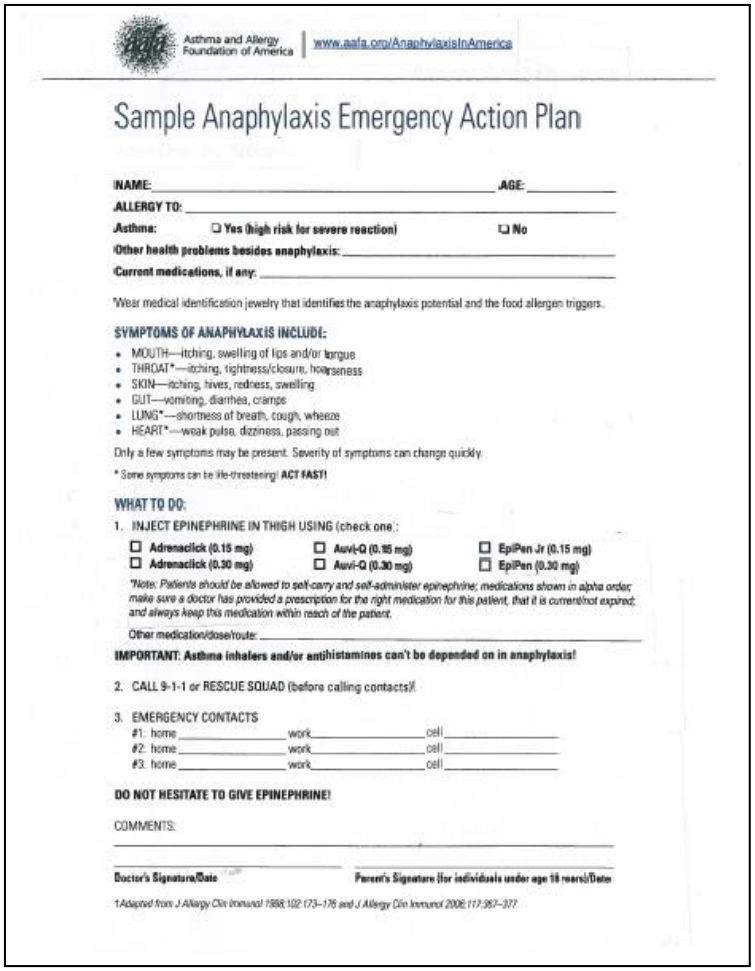
Importance of Emergency Action Plans

Emergency Action Plan (EAP):

- Clear and detailed EAPs
- Practiced annually
- Have a plan for each practice and game site
- Make sure anyone could read and understand the plan
- Include plans for varying types of emergencies (medical, weather, etc.)

Allergy/Anaphylaxis

- Allergic conditions are the most common health issues affecting children in the U.S.
- Prompt recognition of the signs and symptoms of anaphylaxis is critical
- Kids can have allergic reactions even if they have no history of allergies



Asthma and Allergy Foundation of America | www.aafa.org/AnaphylaxisInAmerica

Sample Anaphylaxis Emergency Action Plan

NAME: _____ AGE: _____

ALLERGY TO: _____

Asthma: ❑ Yes (high risk for severe reaction) ❑ No

Other health problems besides anaphylaxis: _____

Current medications, if any: _____

*Wear medical identification jewelry that identifies the anaphylaxis potential and the food allergen triggers.

SYMPTOMS OF ANAPHYLAXIS INCLUDE:

- MOUTH—itching, swelling of lips and/or tongue
- THROAT*—itching, tightness/closure, hoarseness
- SKIN—itching, hives, redness, swelling
- GUT—vomiting, diarrhea, cramps
- LUNG*—shortness of breath, cough, wheeze
- HEART*—weak pulse, dizziness, passing out

Only a few symptoms may be present. Severity of symptoms can change quickly.

* Some symptoms can be life-threatening! **ACT FAST!**

WHAT TO DO:

1. INJECT EPINEPHRINE IN THIGH USING (check one):

❑ Adrenaclick (0.15 mg) ❑ Auvi-Q (0.15 mg) ❑ EpiPen Jr (0.15 mg)
❑ Adrenaclick (0.30 mg) ❑ Auvi-Q (0.30 mg) ❑ EpiPen (0.30 mg)

Note: Patients should be allowed to self-carry and self-administer epinephrine; medications shown in alpha order; make sure a doctor has provided a prescription for the right medication for this patient, that it is current/not expired; and always keep this medication within reach of the patient.

Other medication/dose/route: _____

IMPORTANT: Asthma inhalers and/or antihistamines can't be depended on in anaphylaxis!

2. CALL 9-1-1 or RESCUE SQUAD (before calling contacts)!

3. EMERGENCY CONTACTS
#1: home _____ work _____ cell _____
#2: home _____ work _____ cell _____
#3: home _____ work _____ cell _____

DO NOT HESITATE TO GIVE EPINEPHRINE!

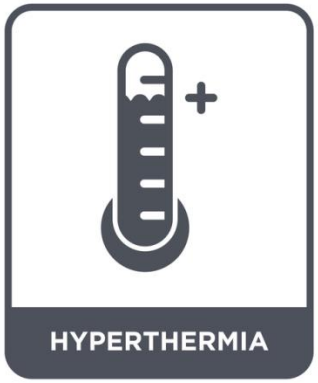
COMMENTS: _____

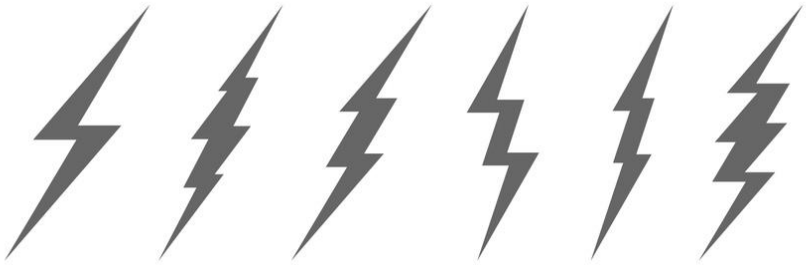
Doctor's Signature/Date **Parent's Signature (for individuals under age 18 years)/Date**

†Adapted from J Allergy Clin Immunol 1998;102:173–176 and J Allergy Clin Immunol 2006;117:391–397.

Severe Weather Policy

- According to the CDC, there is an average of 9,000 cases of heat illness among high school athletes annually
- During 2003–2012, lightning caused an average of 35 deaths per year in the United States





Facts About Child Abuse and Neglect

- Estimated that **1 in 4** children experience some form of child abuse or neglect in their lifetime
- **1 in 7** children have experienced abuse or neglect in the **last year**
- About 1,750 children died from abuse or neglect in 2016 in the United States
- Coaches spend a lot of time with children and it's important that they have a plan in place for keeping children safe from abuse

https://www.cdc.gov/violenceprevention/childabuseandneglect/index.html

Public Health Relevance

- Sports participation is the most common pathway for youth to engage in physical activity
- Physical activity improves morbidity, mortality and quality of life
- TN: Highest combined rate of childhood overweight & obesity in US (37.7% vs. 31% national average)

How to Meet the Bronze Criteria?

- Bronze is the initial level of recognition for Safe Stars
- A league must meet the following criteria:
  - Emergency Action Plan
  - Background checks
  - Minimum of 2 coaches CPR/AED certified
  - AED on site
  - Concussion and sudden cardiac death recognition/management
  - Severe weather policy
  - Anaphylaxis and Allergy Emergency plan
  - Safeguarding/Abuse Prevention Policy

Silver/Gold Level Recognition

- **Must meet all Bronze level criteria for recognition**
- To achieve Silver or Gold, organizations must complete 2 or 4 additional criteria, respectively
- Additional criteria include:
  - Coaches complete additional health, safety and injury prevention training
  - All equipment undergoes safety checks
  - Pre-participation physical exams required for all athletes
  - Implement tobacco policy, “Young Lungs at Play”
  - Medical professional on site for all games
  - Medical professional on site for all practices
  - Promote positive culture and standard of expectations
  - Provide risk and safety information/policies to parents/guardians

Silver/Gold Level Recognition

Examples of promoting positive culture and standard of expectations concerning behavior

- Implement a no bullying policy
- All coaches and players complete the online bullying, hazing and inappropriate behaviors course
- Implement the **"Coaching Boys into Men"** program with players

Examples of additional health, safety and injury prevention training

- Suicide prevention training (QPR)
- First aid training
- PREPARE course – educates on recognizing symptoms of dangerous conditions
- Nutrition and hydration education

Application Process

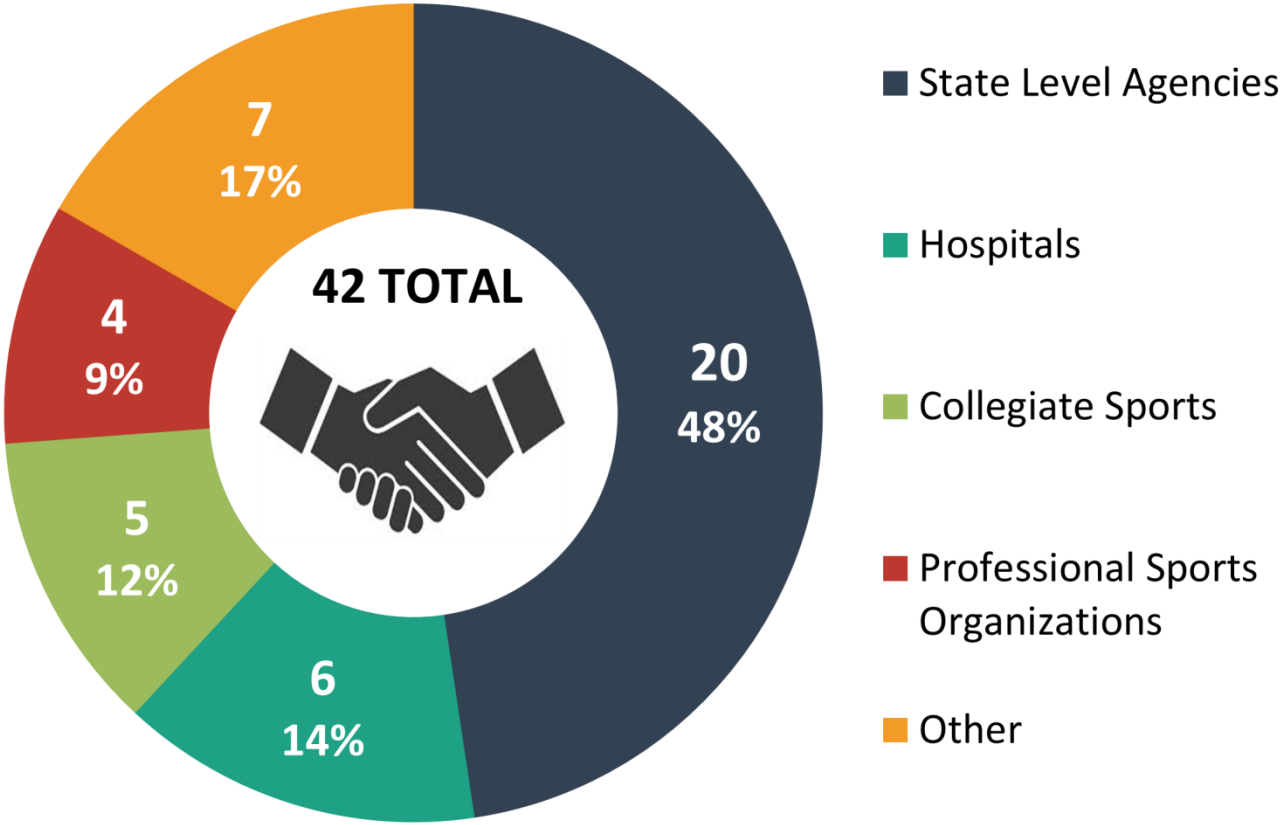
- Application link is located on the TDH Injury Prevention website; https://www.tn.gov/content/dam/tn/health/healthprofboards/Safe_Stars_Application.pdf
- Applicants are encouraged to read through the entire application before attempting to complete it
- Must upload certificates and other documents in application
- Resources listed on the Safe Stars website
- Recognition is valid for 5 years

Benefits for the League

- Signed certificate from the TDH Commissioner
- Safe Stars graphic to put on t-shirts, banners, stickers, etc.
- Recognition on the TDH website
- Parents may preferentially choose leagues and teams that value safety

Partners

Safe Stars Partners



TN Traumatic Brain Injury Program Collaboration and Support

- TN TBI Program housed within the Injury Detection and Prevention section
- TBI addressed in CDC Core SVIPP grant
- TBI Program participates in SVIPP meetings and provides TBI updates regularly to ICIG stakeholders
- Resources: TBI Program and Concussion webpages:

https://www.tn.gov/health/health-program-areas/fhw/vipp/tbi.html

https://www.tn.gov/health/health-program-areas/fhw/vipp/tbi/tennessee-concussion.html

Strategies from CDC Core SVIPP grant:

- Disseminate best practice for Return to Play policy adherence to school and community athletic organizations
- Promote Return to Play training resource to school and community athletic organizations
- Survey coaches to determine if RTP policies have changed due to ongoing TDH education efforts

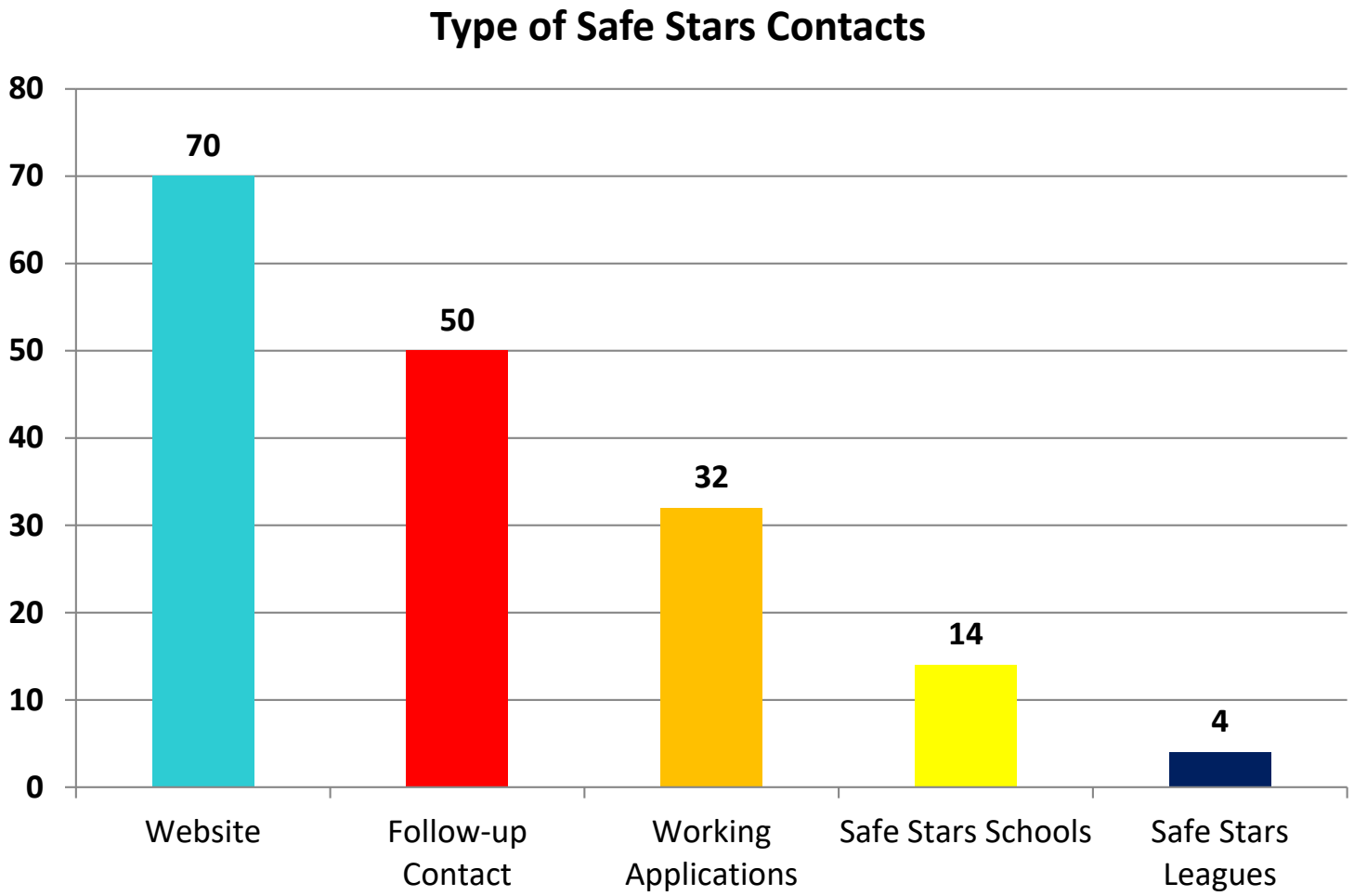
Safe Stars Partners

- American Society of Shoulder and Elbow Therapists
- Belmont University Athletic Department
- Children's Hospital Alliance of Tennessee
- Children's Hospital at Erlanger
- Cumberland Pediatric Foundation
- East Tennessee Children's Hospital
- LeBonheur Children's Hospital
- Lipscomb University Athletic Department
- Memphis Grizzlies
- Monroe Carell Jr. Children's Hospital at Vanderbilt
- Nashville Coaching Coalition
- Nashville Predators
- Nashville Soccer Club
- Nashville Sounds
- Nashville Sports Council
- National Football League Players Association
- Niswonger Children's Hospital
- Office of Tennessee Attorney General
- Program for Injury Prevention in Youth Sports at Vanderbilt
- Safe Kids Cumberland Valley
- Special Olympics - Tennessee

Safe Stars Partners

- Tennessee Academy of Family Physicians
- Tennessee Association of Health, Physical Education, Recreation, and Dance
- Tennessee Athletic Trainers Society
- Tennessee Chapter of the American Academy of Pediatrics
- Tennessee Children's Emergency Care Alliance
- Tennessee Department of Economic and Community Development
- Tennessee Department of Health
- Tennessee Governor’s Children’s Cabinet (Kidcentraltn.com)
- Tennessee Medical Association
- Tennessee Nurses Association
- Tennessee Orthopedic Society
- Tennessee Osteopathic Medical Association
- Tennessee Recreation and Parks Association
- Tennessee Physical Therapy Association
- Tennessee Secondary School Athletic Association
- Tennessee State Soccer Association
- Tennessee Tech University Athletic Department
- University of Tennessee Athletic Department
- Vanderbilt University Athletic Department
- Vanderbilt Sports Medicine
- Vanderbilt University Medical Center

Current Progress



Tennessee Safe Stars Organizations to Date:

1. Kingston Parks and Recreation Center
2. Pride Lions Lacrosse
3. Murfreesboro Parks and Recreation Center
4. Gallatin Soccer Club
5. Smyrna High School
6. Central Magnet School
7. Blackman High School
8. Eagleville High School
9. Siegel High School
10. Riverdale High School
11. LaVergne High School
12. Oakland High School
13. Stewarts Creek High School
14. Gatlinburg-Pittman High School
15. Northview Academy
16. Seymour High School
17. Sevier County High School
18. Pigeon Forge High School

Successes and Challenges

Measured Success

- Great partner support (internal & external)
- Program received widespread media attention for kickoff
- Infrastructure (model policies, website, staff support) in place
- Resources secured for AEDs
- Schools are starting to apply as TN Trainers Association has embraced the program

Challenges

- Volunteer (or part-time) league officials can be intimidated by the application process
- Leagues need policy development training before they apply – some lack policies
- Incentives could be more powerful. AEDs may not be the best for leagues
- Some legal concerns among schools and organizations (indemnity)

Future Plans for Safe Stars

- Continue to work with TN TBI program and other partners to promote Safe Stars
- Work with the Tennessee Trainers Association to expand into more school districts
- Continue to learn from applicants regarding barriers and/or success with the program
- Work with partners to develop and implement program evaluation and publish results

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Questions

Please enter your questions in the Q & A box

Thank you!

Please fill out our short evaluation:
https://www.surveymonkey.com/r/SX7FLR2