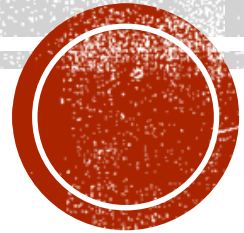
EMERGENCY PREPAREDNESS IN ATHLETIC SETTINS

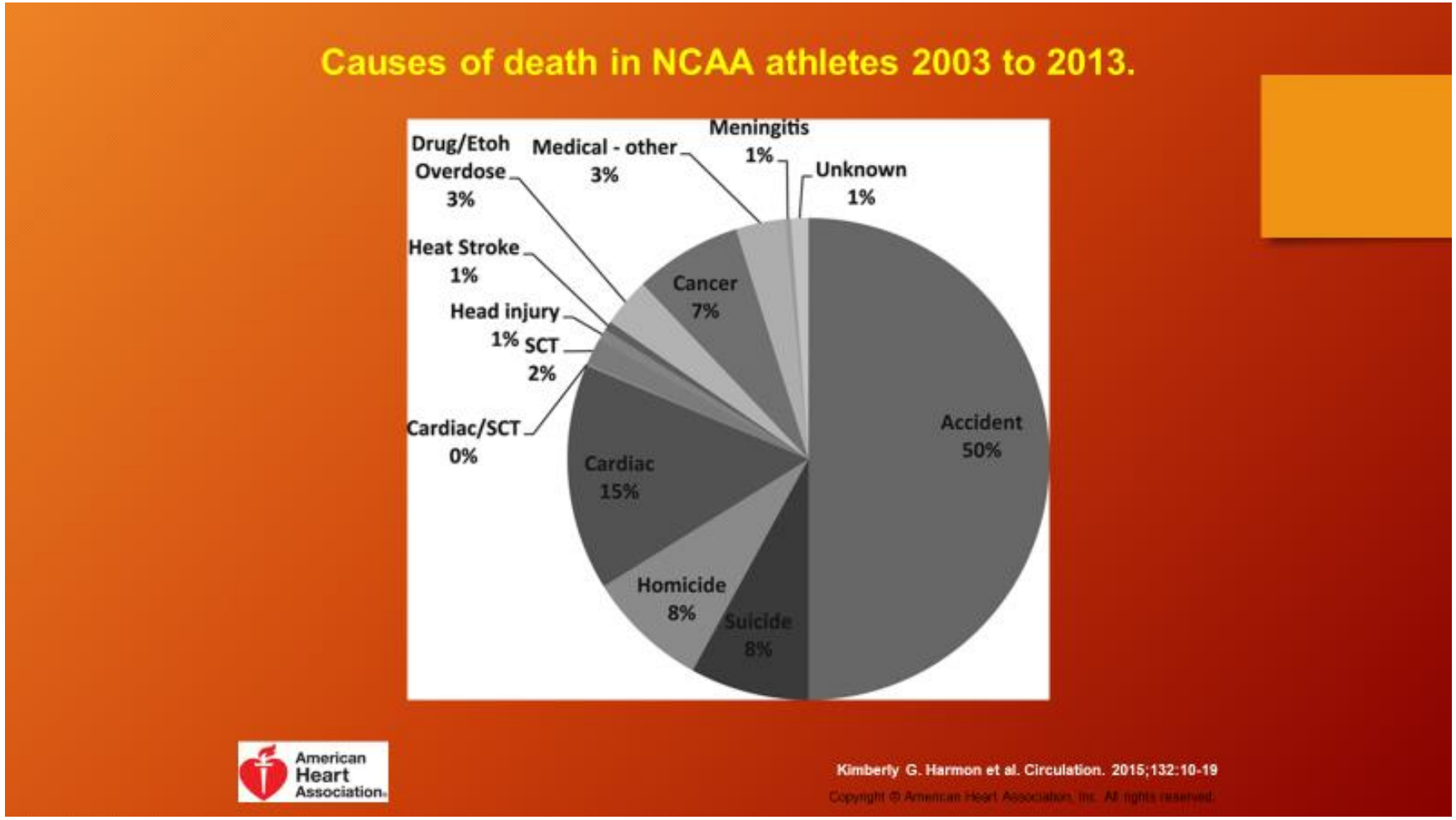


Vince Mosesso, MD
Professor of Emergency Medicine, University of Pittsburgh
Medical Director, UPMC Prehospital Care

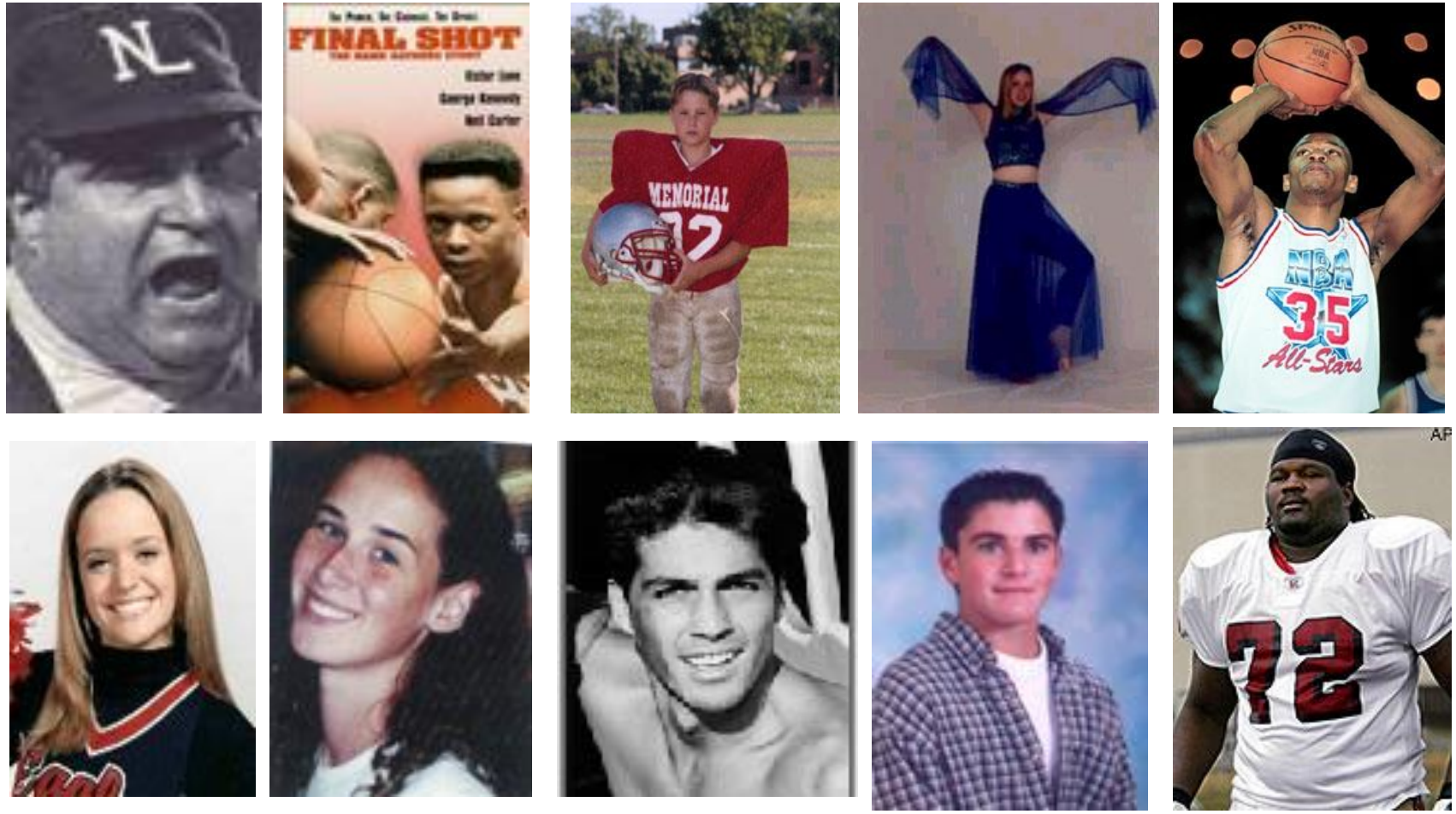
COI

- None

SUDDEN DEATH IN ATHLETES



THE FACES OF SUDDEN DEATH



http://kenheart.org/html/memorials.html

“ONE HUMAN LIFE IS TOO BIG A PRICE FOR ALL THE GAMES OF THE SEASON.”

- James Roscoe Day
- Chancellor of Syracuse University

consensus statement

Journal of Athletic Training 2013;48(4):546–553
doi: 10.4085/1062-6050-48.4.12

The Inter-Association Task Force for Preventing Sudden Death in Secondary School Athletics Programs: Best-Practices Recommendations

CONDITIONS THAT INCREASE RISK

- Lack of EAP
- Lack of medical staff
- Lack of emergency equipment
- Poor heat acclimatization policies
- Improper conditioning sessions

Prevention

Recognition

Treatment

EMERGENCY ACTION PLAN

Developed by school administrators

In collaboration with:

- Coaches
- School medical personnel (ATs, nurses, team and consulting physicians)
- Campus public safety officials
- Local EMS agency

KEY COMPONENTS OF EAP

- Site and facility specific
- ★★☆ Reviewed by all personnel at start of each season
- Communication system
  - Activate EMS
  - Alert on-site responders
- Identify location(s) of emergency equipment
- Position AED(s) to allow retrieval and use within 3 minutes
- Assure readiness and maintenance of emergency equipment
- Staff education and training
- Updated as needed

AMERICAN COLLEGE of SPORTS MEDICINE
LEADING THE WAY

NATIONAL ATHLETIC TRAINERS' ASSOCIATION
HEALTH CARE FOR LIFE & SPORT

ATHLETIC TRAINER SERVICES

- State regulated or certified
- Present for practices and competitive events
- Collaborate with sports medicine physician

CONDITIONING

- Ideally overseen by a credentialed Strength and Conditioning Coach
- Gradual and progressive increase in volume, intensity, mode and duration
- Avoid use of exercise and conditioning activities as punishment

CAUSES OF DEATH IN STUDENT ATHLETES

- Head and Neck Injuries
- Exertional Heat Stroke
- Sudden Cardiac Arrest
- Exertional Sickling

EXERTIONAL HEAT STROKE

- Preseason heat acclimatization program
- Education for all (coaches, parents, athletes) in EHS
  - Intrinsic risk factors
  - Extrinsic risk factors
- Activity modification when environmental conditions extreme
- Ample supply of oral fluids
- Recognition of and immediate cooling for EHS

Relative Humidity (%)	Air Temperature (°F)										
	70	75	80	85	90	95	100	105	110	115	120
Apparent Temperature											
0	64	69	73	78	83	87	91	95	99	103	107
10	65	70	75	80	85	90	95	100	105	111	116
20	66	72	77	82	87	93	99	105	112	120	130
30	67	73	78	84	90	96	104	113	123	135	148
40	68	74	79	86	93	101	110	123	137	151	
50	69	75	81	88	96	107	120	135	150		
60	70	76	82	90	100	114	132	149			
70	70	77	85	93	106	124	144				
80	71	78	86	97	113	136	157				
90	71	79	88	102	122	150	170				
100	72	80	91	108	133	166					

Apparent Temp. (°F)	Danger Category	Injury Threat
Below 80	None	Little or no danger under normal circumstances
80–90	Caution	Fatigue possible if exposure is prolonged and there is physical activity
91–105	Extreme Caution	Heat cramps and heat exhaustion possible if exposure is prolonged and there is physical activity
106–130	Danger	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity
Above 130	Extreme Danger	Heat stroke imminent!

HEAT INDEX & WBGT

ICE WATER IMMERSION

EXERTIONAL SICKLING (EXERTIONAL COLLAPSE ASSOC W/ SCT)

DETERMINATION OF SICKLE CELL TRAIT STATUS

EDUCATION ON PREVENTION, RECOGNITION, TREATMENT

AVAILABILITY OF OXYGEN WHEN AT HIGH ALTITUDES

ADJUSTMENTS IN ACTIVITY LEVEL FOR HEAT, HYDRATION, ALTITUDE

EXERTIONAL SICKLING SHOULD BE TREATED AS MEDICAL EMERGENCY

HEAD AND NECK INJURIES

- Annual brain and spine safety education for coaches and athletes
- Annual training update for ATs, physicians and other medical staff
- Appropriate helmets and equipment
- Medical management plan for acute head and neck injuries
  - Integration with EMS (and hospitals, consultants)
  - Annual practical training for team medical staff with local EMS
- Concussion recognition and evaluation
  - No return to play same day
  - Graduated return to participation

ImPACT© Clinical Report

Mark

Exam Type	Baseline	Post-concussion	Post-concussion	Post-concussion	Post-concussion	Post-concussion
Date Tested	09/21/2004	10/08/2004	10/12/2004	10/15/2004	10/19/2004	10/27/2004
Last Concussion		10/07/2004	10/07/2004	10/07/2004	10/07/2004	10/07/2004
Exam Language	English	English	English	English	English	English
Test Version	2.2.729	2.2.729	2.2.729	2.2.729	2.2.729	2.2.729

Composite Scores *												
Memory composite (verbal)	93	75%	**66**	1%	**57**	<1%	**63**	<1%	87	55%	88	55%
Memory composite (visual)†	70	23%	**41**	<1%	**49**	1%	**47**	<1%	**55**	3%	66	12%
Visual motor speed composite	45.88	85%	46.38	86%	**40.13**	65%	**38.93**	57%	45.85	85%	41.90	72%
Reaction time composite	0.54	46%	0.60	22%	**0.66**	6%	0.54	46%	**0.62**	15%	0.54	46%
Impulse control composite	8		14		10		16		10		11	
Total Symptom Score	0		**14**		3		1		0		0	

* Scores in **bold** type indicate scores that exceed the Reliable Change Index score (RCI) when compared to the baseline score. However, scores that do not exceed the RCI index may still be clinically significant. Percentile scores, if available, are listed in small type. Please consult your ImPACT User Manual for more details.

† Clinical composite score is available only for exams taken in ImPACT version 2.0 or later.

SCAT 5

1

IMMEDIATE OR ON-FIELD ASSESSMENT

The following elements should be assessed for all athletes who are suspected of having a concussion prior to proceeding to the neurocognitive assessment and ideally should be done on-field after the first first aid / emergency care priorities are completed.

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional.

Consideration of transportation to a medical facility should be at the discretion of the physician or licensed healthcare professional.

The GCS is important as a standard measure for all patients and can be done serially if necessary in the event of deterioration in conscious state. The Maddocks questions and cervical spine exam are critical steps of the immediate assessment; however, these do not need to be done serially.

Name: _____

DOB: _____

Address: _____

ID number: _____

Examiner: _____

Date: _____

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

Note: Appropriate sport-specific questions may be substituted.

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

In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed until proven otherwise.

Davis GA, *et al. Br J Sports Med* 2017;**0**:1–8. doi:10.1136/bjsports-2017-097506SCAT5

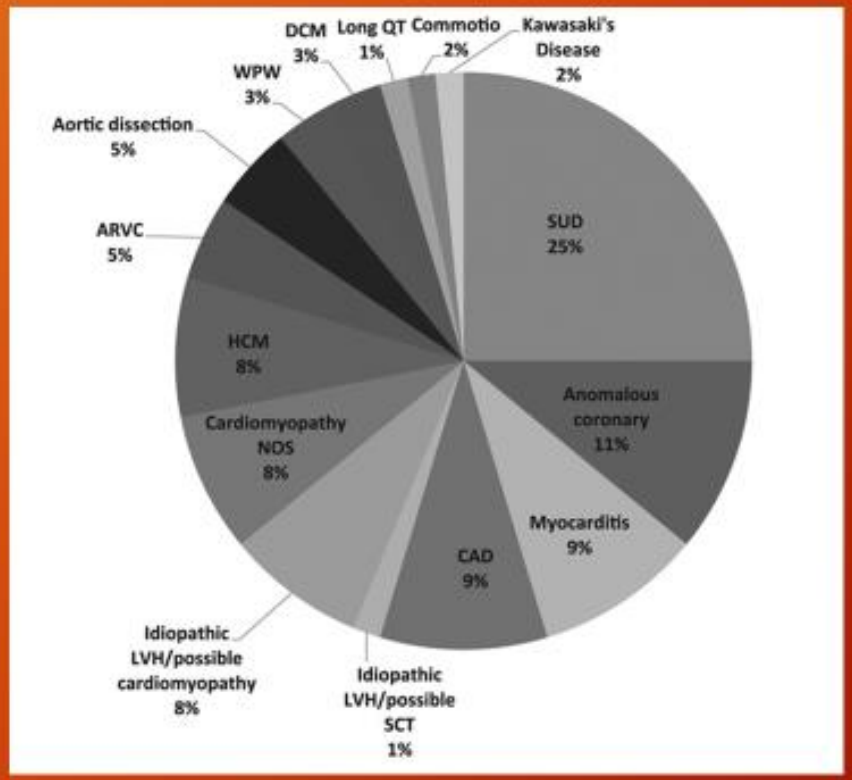
Long Board Placement

SPINE INJURY

VARIOUS METHODS TESTED

SUDDEN CARDIAC ARREST

Causes of sudden cardiac death in athletes.



American Heart Association.

Kimberly G. Harmon et al. Circulation. 2015;132:10-19

SUDDEN CARDIAC ARREST

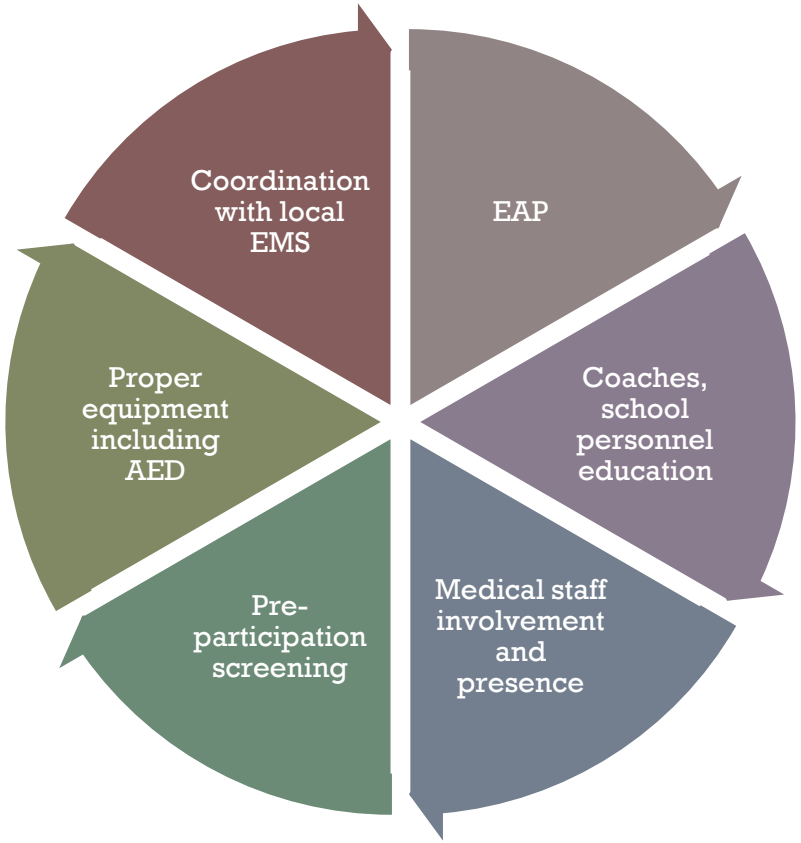
- Preparticipation screening
  - Minimum standard is personal and family history and physical exam
  - Consider ECG
- Recognition of and medical clearance for exertional symptoms
- AED readily available
  - Annual awareness and education of all staff
- Prompt recognition of SCA
  - Often delay due to "seizure" and agonal breathing
- Immediate intervention for SCA with CPR and AED use

Table 3. Reported Symptom Prevalence in Children and Young Adults with Sudden Cardiac Arrest (SCA)*

Symptom	Study Population with Symptom (%)	SCA Victims with Symptoms before Their Most Recent Physician Visit (%)
Fatigue	44	25
Near-syncope/lightheadedness	30	22
Chest pain/discomfort	28	20
Palpitations	28	17
Heart murmur	24	—
Shortness of breath	23	20
Tire more easily than friends	22	—
Syncope	18	14
Unexplained seizure activity	13	11
Decrease in physical activity	11	—
Hypertension	3	—
One of the above symptoms	72	51


OHCA
Lay rescuers
EMS
ED
Cath lab
ICU

WHY PREPARE?


Coordination with local EMS
EAP
Coaches, school personnel education
Medical staff involvement and presence
Pre-participation screening
Proper equipment including AED

BE PREPARED!


THANK YOU