EMS Expectations

PREPARING FOR AND COLLABORATING IN EMERGENT SITUATIONS TO OPTIMIZE PATIENT OUTCOMES

Presented by: Matthew May BS, NRP, EMSI

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No conflicts of interests or financial relationships of any kind related to this presentation

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Learning Objectives

- Review specific fundamental management strategies for enhancing emergency care.
- Identify the essential components of the assessment for optimal transfer of care to the EMS healthcare provider.
- Optimize patient care through awareness of interprofessional skills and professional relationships.

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Quick Note About Myself

- Nationally Registered Paramedic
- State of Connecticut Licensed Paramedic
- Emergency Medical Services Instructor
- Current Clinical Quality Assurance / Improvement Coordinator at New Britain EMS
- Undergraduate Degree from Marist College
- Became an EMT to get into PA school and fell in love with pre hosp emergency medicine

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Emergency!

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Emergent Situations and EMS Activation

- Recent study suggestions 1% and 0.3% of collegiate and high school injuries result in EMS transport respectively.
- Preparing for these uncommon incidents is critical to ensuring optimal patient outcomes
- Emergency activation plans should involve emergency medical services personnel
  - Collaborative effort with EMS for emergent situations
  - Understanding scope of practice
  - Off season / pre season / pre game face to face for EAP review and input
- Emergency Equipment preparations and practice
- Effective initial assessment and injury / emergency management

Clifton, D., Dompier, T., Hirschhorn R., Kay, M., Kerr, Z.,Wasserman, E., Yeargin, S. Epidemiology of Injuries Requiring Emergency Transport Among Collegiate and High School Student-Athletes. *Journal of Athletic Training (2018)*, 53(9) 906-914.

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Critical Incident Management

- AT Board of Certifications has tasked AT's with:
  - Implementing EAPs for all venues and events to guide appropriate actions to optimize patient outcomes
    - Identifying emergency personnel
    - Having emergency equipment available
    - Having Transportation available
    - Communication steps during emergent situations
  - Triage the severity of health conditions
  - Implement appropriate evidence based emergent care procedures to reduce the risk of morbidity and mortality
  - Assess the scene to identify appropriate course of action

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Study: Emergency Action Planning in Secondary School Athletics: A Comprehensive Evaluation of Current Adoption of Best Practice Standards (2019)

- 9,642 athletic trainers working in high schools sampled nationally w/ 13% responding(1273).
  - 89.1% reported having an EAP; only 9.9% described implementing all 12 components cited in the NATA position paper on EAP's.
    - Only 54% reported adopting 9 or more components

Yes, My School	Athletic Trainers' Responses % (n)	95% Confidence Interval
Has a written EAP for managing serious and/or potentially life-threatening sport-related injuries.	89.1 (1014/1138)	87.3, 90.9
Develops and coordinates the EAP with local emergency medical services, school public safety officials, onsite medical personnel or school medical staff, and school administrators.	76.7 (790/1030)	74.1, 79.3
Distributes and reviews the EAP to all relevant athletics staff members annually.	78.4 (808/1031)	75.9, 80.9
Rehearses the EAP annually with athletic trainers, athletic director, coaches, and other pertinent medical personnel.	53.3 (549/1030)	50.3, 56.3
Updates the EAP annually by all relevant athletics staff members.	78.3 (806/1029)	75.8, 80.8
Identifies the personnel and their responsibilities to carry out the plan of action with a designated chain of command.	88.2 (909/1031)	86.2, 90.1
Identifies the location of on-site emergency equipment.	90.2 (924/1024)	88.4, 92.1
Lists contact information for emergency medical services and other key personnel, as well as the facility address and location on the EAP.	88.8 (909/1024)	86.8, 90.7
Provides recommendations for documentation that should be taken after a catastrophic injury.	59.7 (610/1021)	56.7, 62.8
Includes information for health care professionals providing medical coverage included in the review and rehearsal of the plan.	70.8 (726/1026)	68.0, 73.5
Has a venue-specific EAP.	87.4 (890/1018)	84.5, 89.4
Posts the EAP at every venue.	42.9 (434/1012)	39.8, 45.9

Casa, D., Denegar, C., DiStefano, L., Register-Mihalik, J., Scarneo, S., Stearns., (2019) Emergency Action Planning in Secondary School Athletics: A Comprehensive Evaluation of Current Adoption of Best Practice Standards. *Journal of Athletic Training, 54(1):99-105*

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Study: Emergency Action Planning in Secondary School Athletics: A Comprehensive Evaluation of Current Adoption of Best Practice Standards (2019)

- Respondents were asked to indicate access to the following emergency equipment:
- AED (85%)
  - Up to 90% survivability when placed within 1-3 minutes
- CPR mask (85%)
- First aid supplies (86.1%)
- B/P Cuff / Stethoscope (80%)
- Cold water immersion tub (60%)
- Rectal Thermometer (15%)
- Pulse oximeter (20%)
- Oxygen (13%)

Other Considerations:
Stop the Bleed
- Quick Clot
- Tourniquets

Epi Pen (anaphylaxis)
Naloxone kit

*The more components of the EAP recommendations adopted the more likely AT's are to have emergency equipment available

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Study: Emergency Action Planning in Secondary School Athletics: A Comprehensive Evaluation of Current Adoption of Best Practice Standards (2019)

- Discussion points:
  - 762 fatalities among HS athletes 1982 to 2015 with EMS not present at 62% of sudden cardiac deaths.
  - 36% of AT's reported never rehearsing their EAP which can allow deficiencies to be identified and addressed prior to an emergency
    - May indicate lack of understanding of the importance of review
    - Decay in knowledge increasing response times in true emergencies
  - EAP's should incorporate AT's & EMS to carry out the plan
    - Patient care a joint venture when EMS is activated
  - Emergency equipment for treating potential life threatening emergencies needs improvement.

Casa, D., Denegar, C., DiStefano, L., Register-Mihalik, J., Scarneo, S., Stearns., (2019) Emergency Action Planning in Secondary School Athletics: A Comprehensive Evaluation of Current Adoption of Best Practice Standards. *Journal of Athletic Training, 54(1):99-105*

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Emergency Medical Services Personnel's Perceptions of the Roles and Responsibilities of Athletic Trainers During On-field Injury Management (2017)

- 115 EMS personnel(EMR, EMT, A-EMT, Paramedic) across 18 states

Guiding Questions	Associated Survey Questions	EMERGING THEME
1. *WHAT DO EMS PERSONNEL PERCEIVE AS THEIR (EMS') ROLES ON THE FIELD DURING AN EMERGENCY SITUATION AT AN ATHLETIC EVENT?*	What do you think your roles and responsibilities are on the field in an athletic emergency when an AT is NOT present?	EMS Protocols determine how EMS personnel responds to and handle situations on the field
	What do you think your roles and responsibilities are on the field in an athletic emergency when an AT is present?	
	What is the ATs role on the field when EMS is present and when EMS is not present?	
2. *WHAT IS EMS PERSONNEL'S KNOWLEDGE OF ATHLETIC TRAINING?*	In your own words what is an Athletic Trainer (AT)?	EMS personnel possess a lack of knowledge regarding the emergency care domain within athletic training education
	What qualifications do ATs have in regards to emergency response and care?	
	What are the roles and responsibilities of an AT during an athletic emergency?	
3. *DOES EMS PERSONNEL TRUST AN AT DURING AN EMERGENCY SITUATION, INCLUDING MANAGEMENT OF A CERVICAL SPINE INJURY?*	Have you had interactions with an AT? If yes, in what context - please explain	Previous experiences with ATs guide overall trust of the profession
	Would you trust an AT to hold c-spine and facilitate the spine boarding of an athlete? Please explain why or why not	

32% EMS is in charge
23% Patient care

AT's role:
29% assist ems
10% work with ems
17% Assist "when needed"

<50% accurately described 1 or more AT domains

41% were unaware of AT qualifications

Clines, S., Cotter, J., Diakogeorgiou, E., Jusino, D.L. (2017) Emergency Medical Services Personnel's Perceptions of the Roles and Responsibilities of Athletic Trainers During On-Field Injury Management. *Athletic Training and Sports Care, 9(4) 154-162.*

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Emergency Medical Services Personnel's Perceptions of the Roles and Responsibilities of Athletic Trainers During On-field Injury Management (2017)

- Outcomes:
  - EMS and AT's should collaborate to better understand each others professions
  - Better patient outcomes can result from better communication, training and practice
  - Meet and review emergency action plans before the season/event
  - Allow time for an introduction prior to game time
  - Suggest that it is the AT's responsibility to reach out and establish a connection with EMS prior to an emergent situation

Clines, S., Cotter, J., Diakogeorgiou, E., Jusino, D.L. (2017) Emergency Medical Services Personnel's Perceptions of the Roles and Responsibilities of Athletic Trainers During On-Field Injury Management. *Athletic Training and Sports Care, 9(4) 154-162.*

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Athletic Trainers' Perceptions of Interprofessional and Collaborative Practice (2017)

- NATA ATEC Identifies team approach as essential to optimizing patient outcomes.
  - Requires better understanding of others scope of practice
- Methodology: 2,761 certified members of NATA surveyed on their perceptions of interprofessional and collaborative practices in the clinical setting.

Perceptions	Average Score
Construct 1*: AT perceptions of working with other health care professionals	
Highest: Teamwork between ATs and other health care professionals is an essential component of effective patient centered practice	3.84
Lowest: Individuals in other health care professions respect the work done by ATs	2.68
Construct 4*: AT perceptions of influences on roles, responsibilities, and autonomy in collaborative practice	
Highest: When engaging in collaborative practice, athletic trainers and all other medical and health care professionals' roles and expertise should be valued	3.75
Lowest: During collaborative practice, it is clearly defined as to which health care professional is responsible for specific aspects of the patient care plan	2.64

1) SD
2) D
3) A
4) SA

Hankemeier, D., Manspeaker, S., (2017) Athletic Trainers' Perceptions of Interprofessional and Collaborative Practice. *Athletic Training and Sports Care 9(5) 203-216.*

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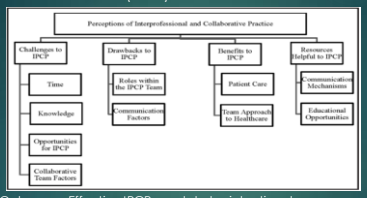
Athletic Trainers' Perceptions of Interprofessional and Collaborative Practice (2017)



- Outcomes: Effective IPCP needs to be intentional
  - AT's should conduct a self-assessment in their own environment on how to improve their role in collaborative practice

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Building An Alliance Between Athletic Trainers and EMS

- Introductions and pre planning meetings (EAP involvement)
  - Scope of practice details, skill sets, emergency protocols
- Tour of facilities / major points of entry and egress / equipment locations
- CMEs and simulations
- Pre game meetings and information sharing

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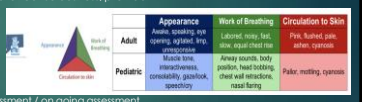
Assessing the Emergent Patient

- Effective initial assessment and injury / emergency management
  - Major Systems overview: ABCDE assessment approach
  - Determine MOI/NOI, Level of consciousness, provider impression(differential)
    - Airway
    - Breathing
    - Circulation
    - Disability
    - Exposure / focused assessment / on going assessment
  - Record findings and assessment outcomes for EMS handoff and continuum of care



Statewide EMS protocols Subcommittee. Connecticut Statewide Emergency Medical Services Protocols(2020v3) www.Portal.CT.Gov

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Airway and Breathing

- Airway:
  - Assess the patient for a patent airway
  - Open the airway using head tilt/chin lift or jaw thrust if suspicious of cervical spine injury
  - Consider oropharyngeal or nasopharyngeal airway
- Assess breathing: Rate / Effort / Tidal Volume / Breath sounds
  - If breathing is inadequate, ventilate (CPR mask / BVM)
  - If breathing is adequate, administer supplemental oxygen if available
  - Monitor Spo2 to 94% - 99%
  - Lung sounds

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Circulation and Disability

- Assess pulse: Rate, Rhythm, Quality
- Control active bleeding
  - Direct pressure, pressure bandages, tourniquets, hemostatic bandages (if available)
- Patients skin color, temperature and moisture
- Disability:
  - Level of consciousness
    - Alert, verbal stimuli, painful stimuli, unresponsive
    - Trauma: Glasgow trauma score
- 911 decision

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Focused Assessment

- Chief complaint, history of present illness and prior medical history if applicable
- Physical assessment as appropriate for injury
- Pain level
- Consider field diagnostic tests:
  - Blood glucose, SpO2 monitoring, temperature check (rectal when appropriate), stroke assessments, concussion assessments
- Begin Treatment if not already started
- Monitor Vital signs every 15 minutes for stable patients / 5 minutes for unstable

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Emergency Scenes & Human Factors

- Scenes can be intense, fluid and dynamic
- Stress and anxiety can have a huge impact on communication
  - As stress increases so does the ability to pay attention to tangent items
- Regardless of our individual ability level in times of increased stressed we are not as good as we think we are
  - Rely on others
- Maintain a sterile scene
  - Limit distractions and outside influences
- Collaborative effort and not about "whose the boss"
  - Leave the ego behind!

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Optimizing Transfer of Care

- Collaborative approach
  - Handoff is situationally dependent depending on patient condition
- EMS will be looking for:
  - Patient demographics (name, age, address, emergency contact info)
  - Verbal Report: SAMPLE history
    - Signs and symptoms
    - Allergies
    - Medications
    - Past medical history
    - Events leading up to the current situation
  - Assessment findings, vitals obtained, treatments performed with applicable outcomes

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911 System Has Been Initiated But Where's The Ambulance?

- The 911 call matters!
- EMS and specifically CT EMS has a variety of EMS deployment models
  - Not every 911 response and ambulance is created equal
    - Varied response times if not already on site
    - Limited resource
    - Volunteer and paid responders
    - First responders
    - BLS ambulances (2 EMT's)
    - ALS ambulances (Paramedic / EMT)
    - ALS fly cars (solo paramedic)
    - Helicopter response

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First Responders

- Can arrive prior to the ambulance
- Generally Emergency Medical Responders
  - Possesses the basic knowledge and skills necessary to provide lifesaving interventions while awaiting additional EMS response
  - Often duel certified as police officers or fire department personnel
  - EMR is generally an 50 - 60 hour course
    - Critical non invasive skills only
    - Certifications: HCP CPR

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The Difference Between Emergency Medical Providers: Why It Matters

- EMT's
  - Provide basic life support and assessment including non-invasive interventions
  - Minimum 150 hours of lecture (2-4 months)
  - 18 hour clinical experience
  - Assist patients with their own medications
  - Common: ASA, oral glucose, check and inject epinephrine, nasal naloxone
  - Scope: Non invasive airway interventions, splinting, bleeding control
  - Certifications: HCP CPR
  - Scope of practice state dependent and must work under physician license

NHTSA, National EMS Scope of Practice Model (Feb. 2007) https://www.ems.gov/education/EMSScope.pdf

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The Difference Between Emergency Medical Providers: Why It Matters

- Paramedics
  - Allied health professional whose primary focus is to provide advanced emergency medical care for critical and emergent patients
  - Must already be an EMT or AEMT
  - 1-2 years; roughly 30-40 credits; can be associates or bachelors
  - Certs: ACLS; PALS; PHTLS; TECC; NRP; HCP CPR;

Airway and breathing	Pharmacology	Cardiac Care
Endotracheal Intubation	Intravenous / interosseous access	Manual Defibrillation
Surgical Cricothyrotomy	Fluid replacement: Saline, lactated ringers, Whole Blood	Pacing
Needle Thoracostomy	50+ emergency medicines: Pain management	Cardioversion

NHTSA, National EMS Scope of Practice Model (Feb. 2007) https://www.ems.gov/education/EMSScope.pdf

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Critical Care Helicopter: Scene Response

- Emergency Services for rural areas
- Flight Nurse (BSN w/ ICU experience) (Paramedic License)
- Flight Paramedic (min 5 years exp. w/flight paramedic certification)
- Flight respiratory therapist (RRT w/ critical care experience, EMT or EMT-P

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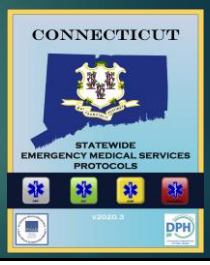
Collaborating With EMS: Understanding How EMS Operates

- Work under the license of a ED physician
- Not independent clinicians
- EMTs & Paramedics are protocol dependent
  - Driven be scientific evidence of best practice
  - Scope of practice is very defined
    - **Can lead to some rigidity in collaborative efforts**



Statewide EMS protocols Subcommittee. Connecticut Statewide Emergency Medical Services Protocols(2020.v3) www.Portal.CT.Gov

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High School Sudden Cardiac Death

- National Center for Catastrophic Sports Injury Research Database
  - 276 Sudden Deaths from 2000-2013
- *Presence of Athletic Trainers, Emergency Action Plans, and Emergency Training at the Time of Sudden Death in Secondary School Athletics*
  - AT's present 38% of the time
  - 62% EMS was not present
  - When there was a venue specific EAP(66%) it was followed 100% of the time
  - Coaches had emergency training in 78% of cases but applied the training only 58% of the time

Huggins, RA., Olivadoti, JM., Adams, WM., Pike, AM., Hosokawa, Y., Stearns, RL., Fontaine, GJ., Fortunati, AR., Rourke, JE., Mazerolle, SM., Denegar, CR., Casa, DJ. Presence of Athletic Trainers, Emergency Action Plans, and Emergency Training at the Time of Sudden Death in Secondary School Athletics Journal of Athletic Training (2017) 52(6) 579.

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Case Review: High School Cardiac Arrest

- Scenario:
  - 2:30 pm
  - Wrestling practice has started
  - Students are running laps in the hallway
  - 17 year old male collapses in the hallway
  - Athlete is found by teammates and is unresponsive
  - Near by security guard is made aware and begins CPR
  - 911 is called by a staff member
  - Coach goes to the training room and gets an AED and athletic trainer
  - AED is applied to the patient - 1 shock is delivered and CPR is continued

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Fire and EMS Response

- 911 operator: 90 seconds to receive and dispatch the call
- 1 minute for emergency personnel to respond in the vehicle
- 4 minute response time
- 3 minutes from arrival on scene to at patient
- 911 Call received to at patient 9 minutes
- EMS Care:
  - CPR continued
  - Initial cardiac rhythm: PEA
  - IO established with epinephrine and normal saline infusion given
  - Patient intubated with ventilator attached
- Timeline: Arrest 2:30; CPR 2:31; Defibrillated 2:35; ROSC 2:43 Transport 2:52

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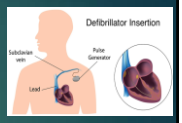
Outcome

- Patient Taken to local hospital
- Transferred to a children's hospital and received an implanted defibrillator
  - AICD – Automated implantable cardioverter defibrillator
    - Shocks at 15-30 Joules
    - Battery lasts 5 years or 100 shocks
    - Externally monitored – automatic notifications
- Discharged from CCMC with no deficits
- Diagnosed with ventricular hypertrophic cardiomyopathy
  - Most people have low risk of SCD – thought to be genetic
  - Common symptoms: SOB, dizziness, palpitations, syncope
  - Up to 30% of athletes with SCD reported symptoms leading to the event
  - Thought to be common cause of sudden cardiac death in people under 30
  - Thickening of the myocardial septum(can be else where) over time causing heart to work harder to to pump the same amount of blood
  - Dx: 12 lead EKG; Echocardiogram



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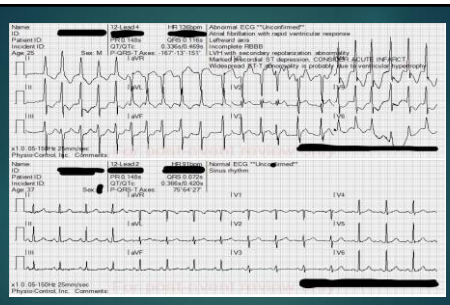

Post Arrest LVH Patient

Normal EKG

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Breaking Down The Care

- Athlete suffers a sudden collapse: direct one specific person to call 911
  - Check responsiveness
    - If unresponsive assess for breathing and pulse:
      - Caution agonal breaths
    - If unresponsive, apneic and pulseless being CPR
    - 30:2 compressions to ventilations if BVM or one way valve barrier if available
      - If no breathing apparatus is available continuous compressions is recommended
    - Apply AED when available while continuing compressions – follow prompts
    - If there is enough personnel rotate chest compressors every 2 minutes
    - Attempt to track number of CPR cycles and number of defibrillations for EMS
    - Attempt to obtain demographic information / medical history / medications / allergies if available

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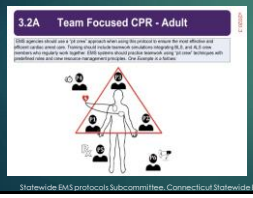
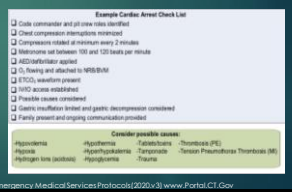
Upon EMS arrival

- Notable differences:
  - Continuous compressions with passive insufflation via NRB (8 minutes)
  - Post 8 minutes: continuous compressions with 1 breath every 10 compressions
  - Stay in place and resuscitate (unless significant trauma)





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Conclusion

- While rare we need to be prepared for the unexpected
  - Up to date emergency action plans that include EMS
  - Necessary emergency equipment that is up to date and available
  - In heightened states of stress be prepared for situations to not go perfectly
- Communication with EMS
  - Understanding that each department is operating under its own set of guidelines
  - Know who your interacting with and their level of certification
- We're all on the same team – take a patient centric approach
  - No ego's!

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References

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