

## EMS Subspecialty Certification Review Course

Cardiovascular: ACS/STEMI

2025



American College of  
Emergency Physicians®  
ADVANCING EMERGENCY CARE

1

---

---

---

---

---

---

---

---

## ABEM EMS Core Content

### 1.3.2 Cardiovascular

#### 1.3.2.1 ST elevation myocardial infarction (STEMI)

##### 1.3.2.1.1 Utilization of electrocardiogram (ECG) in the field

##### 1.3.2.1.2 Systems of care

#### 1.4.2.2.4 Prehospital administration of thrombolytics for STEMI



American College of  
Emergency Physicians®  
ADVANCING EMERGENCY CARE

2

---

---

---

---

---

---

---

---

## Learning Objectives

Upon the completion of this program participants will be able to:

- Provide an overview of an integrated systems of care approach to EMS patients with STEMI.
- Discuss strategies for reducing the time to reperfusion therapy for STEMI patients.
- Describe the requirements for successful 12-lead ECG diagnostic programs, and prehospital fibrinolysis programs.



American College of  
Emergency Physicians®  
ADVANCING EMERGENCY CARE

3

---

---

---

---

---

---

---

---

## Chest Pain and ACS

- Prehospital management of CP has improved with
  - Better clinical examination
  - Earlier administration of effective medications
  - Broad use of 12-lead ECGs before ED arrival
- More rapid perfusion -> better MI outcomes
- Great emphasis is placed on early identification with expedient transport to definitive care



4

---

---

---

---

---

---

---

## Role of Emergency Medical Dispatch

- AHA and ACC encourage EMD pre-arrival instructions for a patient to take ASA for nontraumatic CP if no contraindications exist



5

---

---

---

---

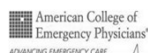
---

---

---

## 12-lead ECG Interpretation

- Prehospital 12-lead ECG = AHA Class I recommendation
- 3 methods for interpretation
  - Computer algorithm
  - Direct interpretation by paramedics
  - Wireless transmission for physician interpretation
    - Role in direct transmission to interventional cardiologist
- Expanded BLS role to acquire & transmit 12-lead ECGs



6

---

---

---

---

---

---

---

### ASA Administration

- Maximal survival benefit when given within the first 4 hours of myocardial infarction
- For every 100 EMS chest pain calls, 2.8 fewer women received prehospital ASA than did men... 😞
- Other research suggests only ~45% of patients eligible to receive ASA actually did



7

---

---

---

---

---

---

---

### Prehospital Fibrinolysis

- More commonly used in the prehospital setting in Europe (physician staffed ambulances)
  - Current trend in Europe has primary PCI replacing prehospital fibrinolysis strategies
- Studies in the early 1990s showed the strategy was feasible and could decrease mortality from STEMI in settings with relatively long EMS responses/transport intervals



8

---

---

---

---

---

---

---

### Prehospital Fibrinolysis

- Mandatory elements: 12-lead acquisition and interpretation; fibrinolytic checklists; experience in advanced life support; communication with receiving institution; medical oversight; CQI STEMI program.
- Advanced Life Support Procedure
- Requires accurate estimation of weight within 10 kg
- Patient disclosure of risk and benefits
- Unique drug storage and exchange environment



9

---

---

---

---

---

---

---

## Systems of Care

- EMS system plays a role in shortening the process of caring for patients with myocardial infarctions
- Patients who are transported by EMS have shorter treatment intervals
- Community outreach to educate about early recognition & appropriate use of EMS



American College of  
Emergency Physicians®  
ADVANCING EMERGENCY CARE

10

---

---

---

---

---

---

---

## Systems of Care: Prehospital Notification

- Prehospital 12-lead ECG -> prehospital notification
  - Shortens door-to-balloon time -> mortality benefit
- Tolerance for false-positive activations
- Need a policy for communication failure
- Collaboration is crucial to ensure protocols, CQI monitoring, and technology compatibility
  - Attention paid to data system security



American College of  
Emergency Physicians®  
ADVANCING EMERGENCY CARE

11

---

---

---

---

---

---

---

## EMS Transport

- Destination protocols
  - Some systems bypass closer non-PCI-capable institution to go directly to a PCI-capable institution
  - Some systems bypass the ED and go directly to the catheterization lab
  - Use of air medical evacuation if appropriate



American College of  
Emergency Physicians®  
ADVANCING EMERGENCY CARE

12

---

---

---

---

---

---

---

### Take-Home Points

- EMS professional must extend the roles of both the BLS provider (eg ECG, PCI activation) and ALS provider (eg prehospital lytic or PCI activation) in STEMI care
- EMS Medical Directors must integrate with both community and hospital systems of STEMI care
- EMS Medical Directors must actively engage in integrated educational and CQI programs for STEMI care



---

---

---

---

---

---

---

