

eMeasure Title	Appropriate Treatment for STEMI Patients in the ED
eMeasure Identifier (Measure Authoring Tool)	
NQF Number	N/A
Measurement Period	January 1, 20XX through December 31, 20XX
Measure Steward	Centers for Medicare & Medicaid Services (CMS)
Measure Developer	Yale New Haven Health Service Corporation/ Center for Outcomes Research and Evaluation (CORE) and the Lewin Group
Endorsed By	None
Description	<p>The percentage of emergency department (ED) patients with a diagnosis of ST-segment elevation myocardial infarction (STEMI) who received appropriate treatment. The measure will be calculated using electronic health record (EHR) data and is intended for use at the facility level in a CMS accountability program, through which it may be publicly reported.</p> <p>NOTE: This is the draft description of the measure. The final description is dependent on questions we will consider through development and with the technical expert panel (TEP). See <i>Stratification, Risk Adjustment, Clinical Recommendation Statement, Definition, Initial Population</i>, and <i>Denominator Exclusions</i> for additional details.</p>
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Disclaimer	This performance measure is not a clinical guideline and does not establish a standard of medical care, and has not been tested for all potential applications. The measure and specifications are provided without warranty.
Measure Scoring	Proportion
Measure Type	Process
Stratification	None
Risk Adjustment	None
Rate Aggregation	None

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Rationale	<p>Studies have shown that delays in the treatment of AMI leads to increased risk of in-hospital mortality and morbidity, with nearly two lives per 1,000 patients lost per hour of delay in treatment (Sohlpour & Yusuf, 2014; Fibrinolytic Therapy Trialists' Collaborative Group, 1994). For the fibrinolytic therapy treatment arm, the American Heart Association (AHA) estimates that 65 lives will be saved per 1,000 patients if treatment is administered within the first hour of symptom onset, and 131 lives will be saved per 1,000 patients treated if fibrinolytic therapy is delivered within the first three hours (O'Connor et al., 2010).</p> <p>The total ischemic time—that is, the time from onset of STEMI symptoms to the initiation of some form of reperfusion therapy—is the principal determinant of health outcomes for patients with an AMI, so timely care is essential to minimize effects of disease morbidity and reduce mortality for this population. Primary PCI is the preferred treatment approach, with guidelines recommending initiation of PCI within 120 minutes from first medical contact (O'Gara et al., 2013). In situations where it is unlikely or impossible for a patient to receive primary PCI within the 120-minute timeframe, fibrinolytic therapy may be used for reperfusion and should be rapidly administered to reduce mortality and minimize morbidity; guidelines recommend that fibrinolytic therapy administration occur within 30 minutes of hospital arrival; this may also require rapid transfer for PCI (O'Gara et al., 2013).</p> <p>Implementation of an eCQM addressing appropriateness and effectiveness of care for STEMI patients in the ED has the potential to improve the delivery of care furthering alignment with current clinical practice guidelines, while reducing adverse health outcomes such as mortality, bleeding events, and reinfarction. Use of the proposed eCQM could also reduce burden on facilities currently measured using the chart-abstracted <i>Fibrinolytic Therapy Received within 30 Minutes of ED Arrival</i> (OP-2) measure and broaden the population for which performance scores could be publicly reported.</p>
Clinical Recommendation Statement	<p>Primary PCI in STEMI</p> <p>The 2013 ACCF/AHA clinical practice guideline for the management of STEMI recommends that:</p> <ul style="list-style-type: none"> • "Primary PCI should be performed in patients with STEMI and ischemic symptoms of less than 12 hours' duration." • "Primary PCI should be performed in patients with STEMI and ischemic symptoms of less than 12 hours' duration who have contraindications to fibrinolytic therapy, irrespective of the time delay from first medical contact."
Clinical Recommendation Statement	<p>Fibrinolytic Therapy when there is an Anticipated Delay to Performing Primary PCI within 120 Minutes of First Medical Contact</p> <p>The 2013 ACCF/AHA clinical practice guideline for the management of STEMI recommends that:</p> <ul style="list-style-type: none"> • "In the absence of contraindications, fibrinolytic therapy should be given to patients with STEMI and onset of ischemic symptoms within the previous 12 hours when it is anticipated that primary PCI cannot be performed within 120 minutes of first medical contact."

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Clinical Recommendation Statement	<p>Transfer to a PCI-Capable Hospital After Fibrinolytic Therapy</p> <p>The 2013 ACCF/AHA clinical practice guideline for the management of STEMI recommends that:</p> <ul style="list-style-type: none"> • Immediate transfer to a PCI-capable hospital for coronary angiography is recommended for suitable patients with STEMI who develop cardiogenic shock or acute severe HF, irrespective of the time delay from MI onset. • Urgent transfer to a PCI-capable hospital for coronary angiography is reasonable for patients with STEMI who demonstrate evidence of failed reperfusion or reocclusion after fibrinolytic therapy. • Transfer to a PCI-capable hospital for coronary angiography is reasonable for patients with STEMI who have received fibrinolytic therapy even when hemodynamically stable and with clinical evidence of successful reperfusion. Angiography can be performed as soon as logistically feasible at the receiving hospital, and ideally within 24 hours, but should not be performed within the first 2 to 3 hours after administration of fibrinolytic therapy.
Improvement Notation	Improvement noted as an increase in the rate
Reference	Fibrinolytic Therapy Trialists' (FTT) Collaborative Group. (1994). Indications for fibrinolytic therapy in suspected acute myocardial infarction: collaborative overview of early mortality and major morbidity results from all randomised trials of more than 1000 patients. The Lancet, 343(8893):311-22.
Reference	O'Connor RE, Brady W, Brooks SC, Diercks D, Egan J, Ghaemmaghami C, Menon V, O'Neil BJ, Travers AH, Yannopoulos D. (2010) Part 10: Acute coronary syndromes: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation, 122(suppl 3): S787-S817. DOI: 10.1161/CIRCULATIONAHA.110.971028.
Reference	O'Gara P, Kushner F, Ascheim D, Casey D, Chung M, de Lemos J, Ettinger S, Fang J, Fesmire F, Franklin B, Granger C, Krumholz H, Linderbaum J, Morrow D, Newby L, Ornato J, Ou N, Radford M, Tamis-Holland J, Tommaso C, Tracy C, Woo Y, Zhao D, Anderson J, Jacobs A, Halperin J, Albert N, Brindis R, Creager M, DeMets D, Guyton R, Hochman J, Kovacs R, Kushner F, Ohman E, Stevenson W, Yancy C. (2013). 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation, 127(4): e362-425.
Reference	Sohlpour A, Yusuf SW. (2014). Fibrinolytic therapy in patients with ST-elevation myocardial infarction. Expert Rev. Cardiovasc. Early online, 1-15.
Guidance	None
Transmission Format	TBD
Initial Population	ED patients 18 years of age and older with a diagnosis of ST-segment elevation myocardial infarction who received or should have received appropriate treatment for AMI.
Denominator	Equals Initial Population

Denominator Exclusions

We prefer to provide a short yet comprehensive list of exclusions in the final measure specifications. We would like to keep the exclusions that have the most clinical and qualitative validity and feasibility.

The following exclusions align with the absolute contraindications identified in the 2013 ACC/AHA STEMI Guideline:

- Patients without diagnosis of STEMI
- Patients with an acceptable reason for delay in fibrinolytic therapy
- Patients with an acceptable reason for not administering fibrinolytic therapy
- Mortality in the ED
- Active bleeding or bleeding diathesis (excluding menses)
- Intracranial or intraspinal surgery within the last two months
- Ischemic stroke within the last three months, except acute ischemic stroke occurring within the 4.5 hours before presentation
- Known malignant intracranial neoplasm (primary or metastatic)
- Known structural cerebral vascular lesion (e.g., AVM)
- Significant facial and/or closed head trauma within three months of presentation
- Severe uncontrolled hypertension (unresponsive to emergency therapy)
- Suspected aortic dissection

Our team also identified the following relative contraindications in the OP-2 (*Fibrinolytic Therapy Received within 30 Minutes of ED Arrival*) specifications or the 2013 ACC/AHA Guideline. These exclusions may be less feasible for quality measurement; however, we request public feedback on whether any of these exclusions are necessary to include in the measure exclusions:

- Active peptic ulcer
- Cardiopulmonary arrest within 30 minutes of ED arrival, including: cardiac arrest, CPR, defibrillation, respiratory arrest, or ventricular fibrillation (V-fib), ventricular tachycardia (VT), or pulseless electrical activity (PEA); or, traumatic or prolonged (>10 minutes) CPR
- For streptokinase/anistreplase: prior exposure (more than five days ago) or prior allergic reaction to these agents
- History of chronic, severe, poorly controlled hypertension
- Initial patient/family refusal
- Intubation within 30 minutes of ED arrival, including: endotracheal intubation, mechanical ventilation, nasotracheal intubation, or orotracheal intubation
- Mechanical circulatory assist device placement within 30 minutes of ED arrival, including: aortic balloon pump, biventricular assist device, intra-aortic balloon, intra-aortic balloon counterpulsation, intra-aortic counterpulsation balloon pump, left ventricular device, percutaneous ventricular assist device, or ventricular assist device
- Non-compressible vascular punctures
- Oral anticoagulant therapy prior to arrival
- Patients with advanced dementia
- Pregnancy
- Recent internal bleeding
- Recent major surgery
- Severe neurologic impairment (e.g., based on Glasgow coma scale or as indicated by the patient receiving therapeutic hypothermia in the ED)

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	<ul style="list-style-type: none"> Significant hypertension on presentation (SBP of >180 mm Hg or DBP of >110 mm Hg) <p>NOTE: We will further consider denominator exclusions based on facility workflows during conversations with the TEP and during field testing.</p>
Numerator	ED STEMI patients whose time from ED arrival to fibrinolytic therapy is 30 minutes or fewer; non-transfer ED STEMI patients who received PCI at a PCI-capable hospital within 90 minutes of arrival; or, ED STEMI patients who were transferred to a PCI-capable hospital within 45 minutes of ED arrival at a non-PCI capable hospital.
Numerator Exclusions	None
Denominator Exceptions	None
Supplemental Data Elements	For every patient evaluated by this measure also identify facility ID, race, ethnicity and gender.