

## NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

### Measure Information Form

**Measure Set:** Acute Myocardial Infarction (AMI)

**Set Measure ID#:** AMI-8a

**Performance Measure Name:** Primary PCI Received Within 90 Minutes of Hospital Arrival

**Description:** Acute myocardial infarction (AMI) patients with ST-segment elevation or LBBB on the ECG closest to arrival time receiving primary PCI during the hospital stay with a time from hospital arrival to PCI of 90 minutes or less

**Rationale:** The early use of primary angioplasty in patients with ST-segment myocardial infarction (STEMI) results in a significant reduction in mortality and morbidity. The earlier primary coronary intervention is provided, the more effective it is (Brodie, 1998 and DeLuca, 2004). National guidelines recommend the prompt initiation of PCI in patients presenting with ST-elevation myocardial infarction (Antman, 2004; Antman, 2008; and Kushner, 2009).

**Type of Measure:** Process

**Improvement Noted as:** An increase in the rate

**Numerator Statement:** AMI patients whose time from hospital arrival to primary PCI is 90 minutes or less

**Included Populations:** Not Applicable

**Excluded Populations:** None

**Data Elements:**

- *Arrival Date*
- *Arrival Time*
- *First PCI Date*
- *First PCI Time*

**Denominator Statement:** AMI patients with ST-elevation or LBBB on ECG who received primary PCI

**Included Populations:** Discharges with:

- *An ICD-9-CM Principal Diagnosis Code for AMI as defined in Appendix A,*

Table 1.1

**AND**

- PCI (*ICD-9-CM Principal and Other Procedure Codes* for PCI as defined in Appendix A, Table 1.2)

**AND**

- ST-segment elevation or LBBB on the ECG performed closest to hospital arrival

**AND**

- PCI performed within 24 hours after hospital arrival

**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients received as a transfer from an inpatient or outpatient department of another hospital
- Patients received as a transfer from the emergency/observation department of another hospital
- Patients received as a transfer from an ambulatory surgery center
- Patients administered fibrinolytic agent prior to PCI
- PCI described as non-primary by a physician/advanced practice nurse/physician assistant (physician/APN/PA)
- Patients who did not receive PCI within 90 minutes and had a reason for delay documented by a physician/APN/PA (e.g., social, religious, initial concern or refusal, cardiopulmonary arrest, balloon pump insertion, respiratory failure requiring intubation)

**Data Elements:**

- *Admission Date*
- *Arrival Date*
- *Arrival Time*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *Fibrinolytic Administration*
- *First PCI Date*
- *First PCI Time*
- *ICD-9-CM Other Procedure Codes*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Initial ECG Interpretation*
- *Non-Primary PCI*
- *Reason for Delay in PCI*
- *Transfer From Another Hospital or ASC*

**Risk Adjustment:** No

**Data Collection Approach:** Retrospective data sources for required data elements include administrative data and medical records.

**Data Accuracy:** Variation may exist in the assignment of ICD-9-CM codes; therefore, coding practices may require evaluation to ensure consistency.

**Measure Analysis Suggestions:** The measure rate for primary PCI received within 90 minutes of hospital arrival should be analyzed in conjunction with the median time to primary PCI measure (AMI-8). These measures, used together, will assist in understanding the number of AMI patients that are receiving primary PCI within 90 minutes of hospital arrival, and will identify the hospital's median time to primary PCI and potential opportunities for improvement to increase the rate of patients receiving primary PCI in 90 minutes or less.

**Sampling:** Yes, please refer to the measure set specific sampling requirements and for additional information see the Population and Sampling Specifications section.

**Data Reported as:** Aggregate rate generated from count data reported as a proportion

**Selected References:**

- Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). 2004.
- Antman EM, Hand M, Armstrong PW, Bates ER, Green LA, Halasyamani LK, et al. 2007 focused update of the ACC/AHA 2004 Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Group to Review New Evidence and Update the ACC/AHA 2004 Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction). *J Am Coll Cardiol*. 2008;51:210–47.
- Brodie BR, Stuckey TD, Wall TC, Kissling G, Hansen CJ, Muncy DB, et al. Importance of time to reperfusion for 30-day and late survival and recovery of left ventricular function after primary angioplasty for acute myocardial infarction. *J Am Coll Cardiol*. 1998;32-1312-9.
- DeLuca G, Suryapranata H, Ottervanger JP, Antman EM. Time delay to treatment and mortality in primary angioplasty for acute myocardial infarction: every minute of delay counts. *Circulation* 2004;109(10):1223-1225.
- Krumholz HM, Anderson JL, Bachelder BL, Fesmire FM, Fihn SD, Foody JM, et al. ACC/AHA 2008 performance measures for adults with ST-elevation and non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures

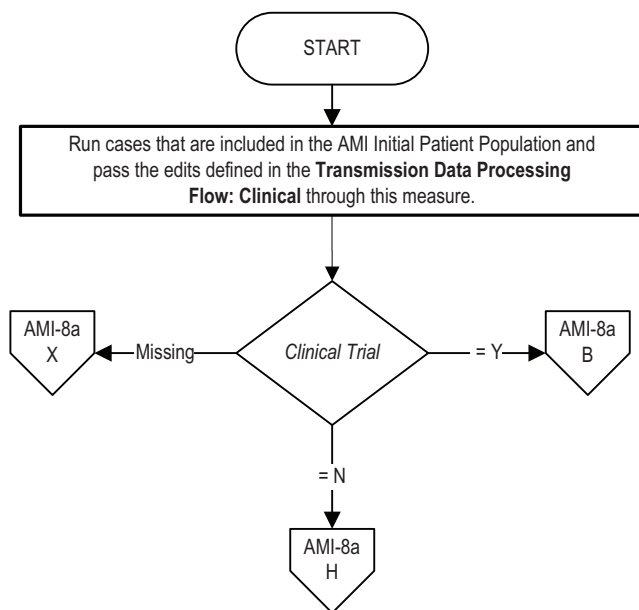
(Writing Committee to Develop Performance Measures for ST-Elevation and Non-ST-Elevation Myocardial Infarction). *J Am Coll Cardiol.* 2008;52:2046 –99.

- Kushner FG, Hand M, Smith SC Jr, King SB 3rd, Anderson JL, Antman EM, et al. 2009 focused updates: ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction (updating the 2004 guideline and 2007 focused update) and ACC/AHA/SCAI guidelines on percutaneous coronary intervention (updating the 2005 guideline and 2007 focused update): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2009;54:2205– 41.

## AMI-8a: Primary PCI Received Within 90 Minutes of Hospital Arrival

**Numerator:** AMI patients whose time from hospital arrival to primary PCI is 90 minutes or less.

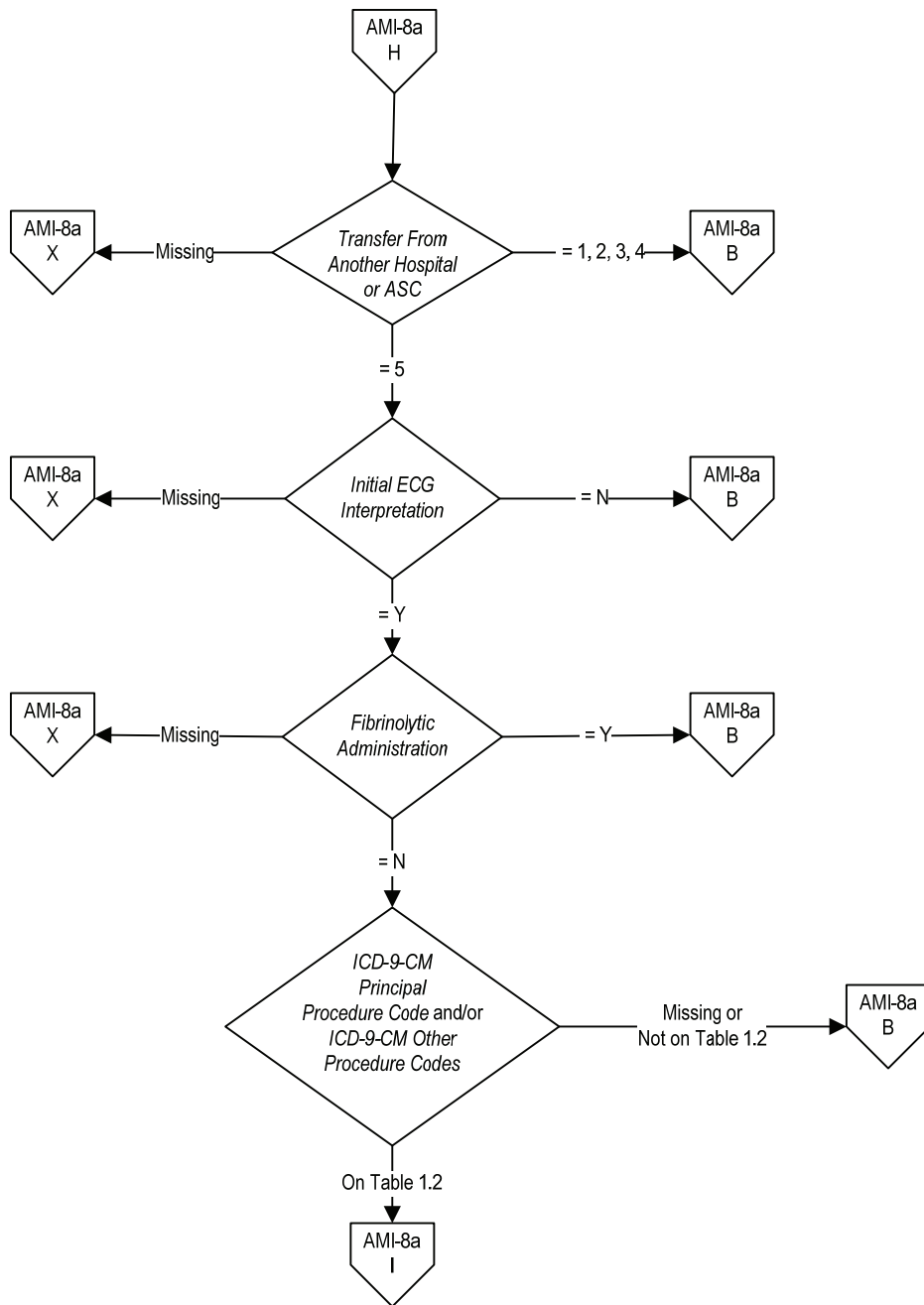
**Denominator:** AMI patients with ST-elevation or LBBB on ECG who received primary PCI.

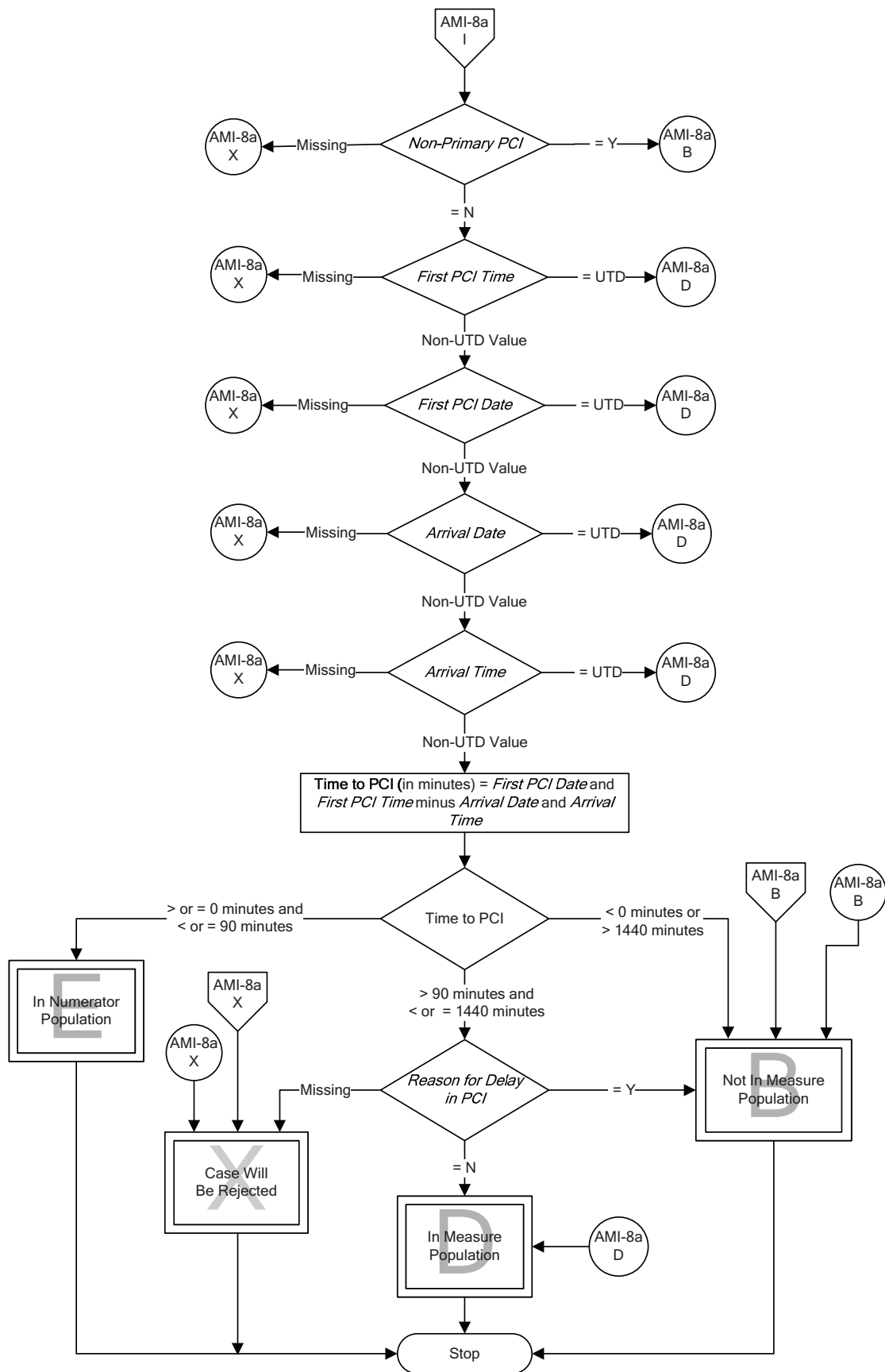


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**Variable Key:**  
Time to Primary PCI

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## Acute Myocardial Infarction (AMI)-8a: Primary Percutaneous Coronary Intervention (PCI) Received Within 90 Minutes of Hospital Arrival

**Numerator:** Acute Myocardial Infarction (AMI) patients whose time from hospital arrival to primary PCI is 90 minutes or less.

**Denominator:** AMI patients with ST-elevation or Left Bundle Branch Block (LBBB) on Electrocardiogram (ECG) who received Primary PCI.

**Variable Key:** Time to Primary PCI

1. Start processing. Run cases that are included in the AMI Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.
2. Check Clinical Trial
  - a. If Clinical Trial is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Clinical Trial equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
  - c. If Clinical Trial equals No, continue processing and proceed to Transfer From Another Hospital or ASC.
3. Check Transfer From Another Hospital or ASC
  - a. If Transfer From Another Hospital or ASC is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Transfer From Another Hospital or ASC equals 1, 2, 3 or 4, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
  - c. If Transfer From Another Hospital or ASC equals 5, continue processing and proceed to Initial ECG Interpretation.
4. Check Initial ECG Interpretation
  - a. If Initial ECG Interpretation is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Initial ECG Interpretation equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
  - c. If Initial ECG Interpretation equals Yes, continue processing and proceed to Fibrinolytic Administration.

5. Check Fibrinolytic Administration
  - a. If Fibrinolytic Administration is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Fibrinolytic Administration equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
  - c. If Fibrinolytic Administration equals No, continue processing and proceed to ICD-9-CM Principal Procedure Code and/or ICD-9-CM Other Procedure Codes.
6. Check ICD-9-CM Principal Procedure Code and/or ICD-9-CM Other Procedure Codes
  - a. If the ICD-9-CM Principal Procedure Code and/or ICD-9-CM Other Procedure Codes is missing or not on Table 1.2, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
  - b. If the ICD-9-CM Principal Procedure Code and/or ICD-9-CM Other Procedure Codes are on Table 1.2, continue processing and proceed to Non-Primary PCI.
7. Check Non-Primary PCI
  - a. If Non-Primary PCI is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Non-Primary PCI equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
  - c. If Non-Primary PCI equals No, continue processing and proceed to First PCI Time.
8. Check First PCI Time
  - a. If First PCI Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If First PCI Time equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
  - c. If First PCI Time equals a Non Unable to Determine value, continue processing and proceed to First PCI Date.
9. Check First PCI Date
  - a. If First PCI Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If First PCI Date equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
  - c. If First PCI Date equals a Non Unable to Determine value, continue processing and proceed to Arrival Date.
- 10. Check Arrival Date
  - a. If Arrival Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Arrival Date equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
  - c. If Arrival Date equals a Non Unable to Determine value, continue processing and proceed to Arrival Time.
- 11. Check Arrival Time
  - a. If Arrival Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
  - b. If Arrival Time equals Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
  - c. If Arrival Time equals a Non Unable to Determine value, continue processing and proceed to Time to PCI calculation.
- 12. Calculate Time to PCI. Time to PCI, in minutes, is equal to the First PCI Date and First PCI Time minus the Arrival Date and Arrival Time.
- 13. Check Time to PCI
  - a. If the Time to PCI is less than zero minutes or greater than 1440 minutes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
  - b. If the Time to PCI is greater than or equal to zero minutes and less than or equal to 90 minutes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
  - c. If the Time to PCI is greater than 90 minutes and less than or equal to 1440 minutes, continue processing and proceed to Reason for Delay in PCI.
- 14. Check Reason for Delay in PCI
  - a. If Reason for Delay in PCI is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If Reason for Delay in PCI is Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
- c. If Reason for Delay in PCI is No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.