



National Hospital Quality
Measures

Measure Definitions

***Excerpts from the Specifications Manual for
National Hospital Quality Measures for
Acute Myocardial Infarction Measure Set***

***Applicable to Cases Discharged January 1, 2012
through June 30, 2012***

Document Information

The *Specifications Manual for National Hospital Quality Measures* Version 4.0a, June 2012 is the collaborative work of the Centers for Medicare & Medicaid Services and the Joint Commission. The *Specifications Manual* is periodically updated by the Centers for Medicare & Medicaid Services and the Joint Commission. Users of the *Specifications Manual for National Hospital Quality Measures* must update their software and associated documentation based on the published manual production timelines.



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ACUTE MYOCARDIAL INFARCTION NATIONAL HOSPITAL INPATIENT QUALITY MEASURES

Set Measure ID #	Measure Short Name
AMI-1 ^{1, 2}	Aspirin at Arrival
AMI-2	Aspirin Prescribed at Discharge
AMI-3 ^{1, 2}	ACEI or ARB for LVSD
AMI-5 ^{1, 2}	Beta-Blocker Prescribed at Discharge
AMI-7	Median Time to Fibrinolysis
AMI-7a	Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival
AMI-8	Median Time to Primary PCI
AMI-8a	Primary PCI Received Within 90 Minutes of Hospital Arrival
AMI-10	Statin Prescribed at Discharge

AMI DATA ELEMENT LIST

General Data Element Name	Collected For:
<i>Admission Date</i>	All Records
<i>Birthdate</i>	All Records
<i>Discharge Date</i>	All Records (Used in Algorithm for AMI-1 ^{1, 2})
<i>First Name</i>	All Records ³
<i>Hispanic Ethnicity</i>	All Records ³
<i>ICD-9-CM Other Diagnosis Codes</i>	All Records
<i>ICD-9-CM Other Procedure Codes</i>	All Records (Used in Algorithm for AMI-8, AMI-8a)
<i>ICD-9-CM Other Procedure Dates</i>	All Records
<i>ICD-9-CM Principal Diagnosis Code</i>	All Records
<i>ICD-9-CM Principal Procedure Code</i>	All Records (Used in Algorithm for AMI-8, AMI-8a)
<i>ICD-9-CM Principal Procedure Date</i>	All Records
<i>Last Name</i>	All Records ³
<i>Patient HIC #</i>	Collected by CMS for patients with a standard HIC#
<i>Patient Identifier</i>	All Records³
<i>Payment Source</i>	All Records
<i>Physician 1</i>	Optional for All Records ³
<i>Physician 2</i>	Optional for All Records ³
<i>Postal Code</i>	All Records ³
<i>Race</i>	All Records ³
<i>Sample</i>	Used in transmission of the Joint Commission's aggregate data file and the Hospital Clinical Data file ⁴
<i>Sex</i>	All Records

Algorithm Output Data Element Name	Collected For:
<i>Measure Category Assignment</i>	Used in the calculation of the Joint Commission's aggregate data and in the transmission of the Hospital Clinical Data file ^{2, 4}
<i>Measurement Value</i>	Used in the calculation of the Joint Commission's aggregate data Continuous Variable Measures (AMI-7, AMI-8), and in the transmission of the Hospital Clinical Data file ^{2, 4}

AMI DATA ELEMENT LIST

AMI Data Element Name	Collected For:
<i>ACEI Prescribed at Discharge</i>	AMI-3 ^{1, 2}
<i>ARB Prescribed at Discharge</i>	AMI-3 ^{1, 2}
<i>Arrival Date</i>	AMI-1 ^{1, 2} , AMI-7, AMI-7a, AMI-8, AMI-8a
<i>Arrival Time</i>	AMI-7, AMI-7a, AMI-8, AMI-8a
<i>Aspirin Prescribed at Discharge</i>	AMI-2
<i>Aspirin Received Within 24 Hours Before or After Hospital Arrival</i>	AMI-1 ^{1, 2}
<i>Beta-Blocker Prescribed at Discharge</i>	AMI-5 ^{1, 2}
<i>Clinical Trial</i>	AMI-1 ^{1, 2} , AMI-2, AMI-3 ^{1, 2} , AMI-5 ^{1, 2} , AMI-7, AMI-7a, AMI-8, AMI-8a, AMI-10
<i>Comfort Measures Only</i>	AMI-1 ^{1, 2} , AMI-2, AMI-3 ^{1, 2} , AMI-5 ^{1, 2} , AMI-10
<i>Discharge Disposition</i>	AMI-1 ^{1, 2} , AMI-2, AMI-3 ^{1, 2} , AMI-5 ^{1, 2} , AMI-10
<i>Fibrinolytic Administration</i>	AMI-7, AMI-7a, AMI-8, AMI-8a
<i>Fibrinolytic Administration Date</i>	AMI-7, AMI-7a
<i>Fibrinolytic Administration Time</i>	AMI-7, AMI-7a
<i>First PCI Date</i>	AMI-8, AMI-8a
<i>First PCI Time</i>	AMI-8, AMI-8a
<i>Initial ECG Interpretation</i>	AMI-7, AMI-7a, AMI-8, AMI-8a
<i>LDL-c Less Than 100 mg/dL</i>	AMI-10
<i>LVSD</i>	AMI-3 ^{1, 2}
<i>Non-Primary PCI</i>	AMI-8, AMI-8a
<i>Reason for Delay in Fibrinolytic Therapy</i>	AMI-7, AMI-7a
<i>Reason for Delay in PCI</i>	AMI-8, AMI-8a
<i>Reason for No ACEI and No ARB at Discharge</i>	AMI-3 ^{1, 2}
<i>Reason for No Aspirin at Discharge</i>	AMI-2
<i>Reason for No Aspirin on Arrival</i>	AMI-1 ^{1, 2}
<i>Reason for No Beta-Blocker at Discharge</i>	AMI-5 ^{1, 2}
<i>Reason for Not Prescribing Statin Medication at Discharge</i>	AMI-10
<i>Statin Medication Prescribed at Discharge</i>	AMI-10
<i>Transfer From Another Hospital or ASC</i>	AMI-7, AMI-7a, AMI-8, AMI-8a

¹ CMS Voluntary ONLY

² The Joint Commission ONLY

³ CMS ONLY

⁴ Transmission Data Element

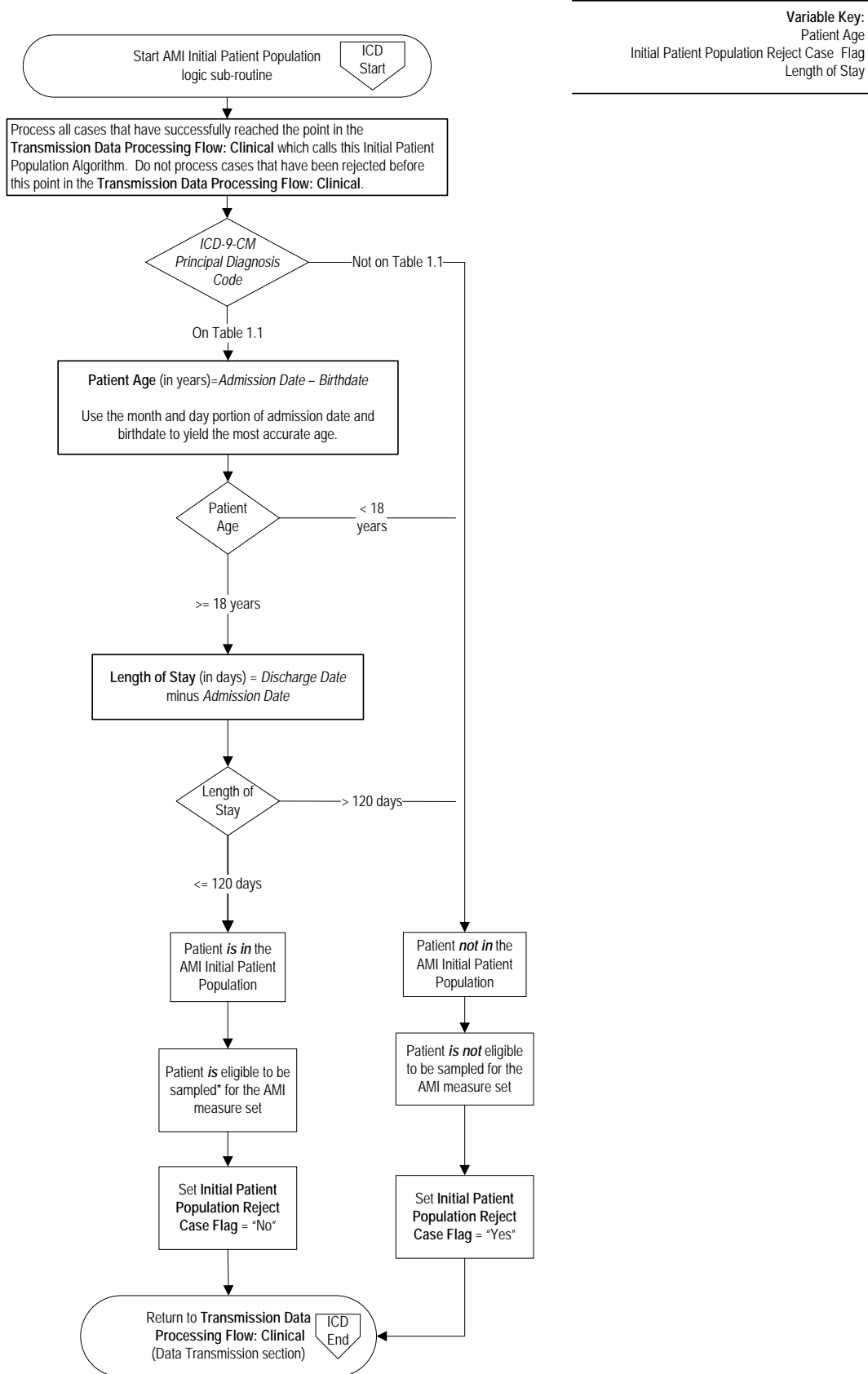
Acute Myocardial Infarction (AMI) Initial Patient Population

The population of the AMI measure set is identified using 4 data elements:

- *ICD-9-CM Principal Diagnosis Code*
- *Admission Date*
- *Birthdate*
- *Discharge Date*

Patients admitted to the hospital for inpatient acute care with an *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1, a Patient Age (*Admission Date* minus *Birthdate*) greater than or equal to 18 years and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days are included in the AMI Initial Patient Population and are eligible to be sampled.

AMI Initial Patient Population Algorithm



Acute Myocardial Infarction (AMI) Initial Patient Population Algorithm

Variable Key: Patient Age, Initial Patient Population Reject Case Flag, and Length of Stay

1. Start AMI Initial Patient Population logic sub-routine. Process all cases that have successfully reached the point in the Transmission Data Processing Flow: Clinical which calls this Initial Patient Population Algorithm. Do not process cases that have been rejected before this point in the Transmission Data Processing Flow: Clinical.
2. Check ICD-9-CM Principal Diagnosis Code
 - a. If the ICD-9-CM Principal Diagnosis Code is not on Table 1.1, the patient is not in the AMI Initial Patient Population and is not eligible to be sampled for the AMI measure set. Set the Initial Patient Population Reject Case Flag to equal Yes. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.
 - b. If the ICD-9-CM Principal Diagnosis Code is on Table 1.1, continue processing and proceed to patient age calculation.
3. Calculate Patient Age. Patient Age, in years, is equal to the Admission Date minus the Birthdate. Use the month and day portion of admission date and birthdate to yield the most accurate age.
4. Check Patient Age
 - a. If the Patient Age is less than 18 years, the patient is not in the AMI Initial Patient Population and is not eligible to be sampled for the AMI measure set. Set the Initial Patient Population Reject Case Flag to equal Yes. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.
 - b. If the Patient Age is greater than or equal to 18 years, continue processing and proceed to Length of Stay Calculation.
5. Calculate the Length of Stay. Length of Stay, in days, is equal to the Discharge Date minus the Admission Date.
6. Check Length of Stay
 - a. If the Length of Stay is greater than 120 days, the patient is not in the AMI Initial Patient Population and is not eligible to be sampled for the AMI measure set. Set the Initial Patient Population Reject Case Flag to equal Yes. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

- b. If the Length of Stay is less than or equal to 120 days, the patient is in the AMI Initial Patient Population and is eligible to be sampled for the AMI measure set. Set Initial Patient Population Reject Case Flag to equal No. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

AMI Sample Size Requirements

Hospitals that choose to sample have the option of sampling quarterly or sampling monthly. A hospital may choose to use a larger sample size than is required. Hospitals whose Initial Patient Population size is less than the minimum number of cases per quarter for the measure set cannot sample. Hospitals that have five or fewer AMI discharges (both Medicare and non-Medicare combined) in a quarter are not required to submit AMI patient level data to the QIO Clinical Warehouse and Joint Commission's Data Warehouse.

Regardless of the option used, hospital samples must be monitored to ensure that sampling procedures consistently produce statistically valid and useful data. Due to exclusions, hospitals selecting sample cases **MUST** submit **AT LEAST** the minimum required sample size.

The following sample size tables for each option automatically build in the number of cases needed to obtain the required sample sizes. For information concerning how to perform sampling, refer to the Population and Sampling Specifications section in this manual.

Quarterly Sampling

Hospitals performing quarterly sampling for AMI must ensure that its Initial Patient Population and sample size meet the following conditions:

Quarterly Sample Size Based on Initial Patient Population Size for the AMI Measure Set

<i>Average Quarterly Initial Patient Population Size "N"</i>	<i>Minimum Required Sample Size "n"</i>
≥ 1551	311
391 - 1550	20% of Initial Patient Population size
78 - 390	78
6 - 77	No sampling; 100% Initial Patient Population required
0 - 5	Submission of patient level data is encouraged but not required: <ul style="list-style-type: none"> • CMS: if submission occurs, 1 – 5 cases of the Initial Patient Population may be submitted • The Joint Commission: if submission occurs, 100% Initial Patient Population required

Monthly Sampling

Hospitals performing monthly sampling for AMI must ensure that its Initial Patient Population and sample size meet the following conditions:

Monthly Sample Size Based on Initial Patient Population Size for the AMI Measure Set

Hospital's Measure

Average Monthly Initial Patient Population Size "N"	Minimum Required Sample Size "n"
≥ 516	104
131 - 515	20% of Initial Patient Population size
26 - 130	26
< 26	No sampling; 100% Initial Patient Population required

Sample Size Examples

- Quarterly sampling:
 - A hospital's AMI Initial Patient Population size is 100 patients during the fourth quarter. The required sample size is seen to be a minimum of 78 AMI patients for this quarter.
 - A hospital's AMI Initial Patient Population size is 392 patients during the third quarter. The required sample size is 20% of the patient population or 79 cases for the quarter (twenty percent of 392 equals 78.4 rounded to the next highest whole number equals 79).
 - A hospital's AMI Initial Patient Population is 4 patients during the first quarter. Submission of patient level data is not required. If the hospital chooses to submit patient level data:
 - CMS: the quarterly sample size would be 1 – 4 cases for the quarter
 - The Joint Commission: the required quarterly sample size would be 100% of the patient population or 4 cases for the quarter.
- Monthly sampling
 - A hospital's AMI Initial Patient Population size is 516 patients during March. The required sample size is 104 cases from the patient population.
 - A hospital's AMI Initial Patient Population size is 502 patients during July. The required sample size is 20% of the patient population or 101 cases for the month (twenty percent of 502 equals 100.4 rounded to the next highest whole number equals 101).

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form
Collected For: The Joint Commission Only
CMS Voluntary Only

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID #: AMI-1

Performance Measure Name: Aspirin at Arrival

Description: Acute myocardial infarction (AMI) patients who received aspirin within 24 hours before or after hospital arrival

Rationale: The early use of aspirin in patients with acute myocardial infarction results in a significant reduction in adverse events and subsequent mortality. The benefits of aspirin therapy on mortality are comparable to fibrinolytic therapy. The combination of aspirin and fibrinolytics provides additive benefits for patients with ST-elevation myocardial infarction (ISIS-2, 1988). Aspirin is also effective in patients with non-ST-elevation myocardial infarction (Theroux, 1988 and RISC Group, 1990). National guidelines strongly recommend early aspirin for patients hospitalized with AMI (Antman, 2004; Antman, 2008; and Anderson, 2007).

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: AMI patients who received aspirin within 24 hours before or after hospital arrival

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:

Aspirin Received Within 24 Hours Before or After Hospital Arrival

Denominator Statement: AMI patients

Included Populations:

Discharges with an *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after arrival
- Patients enrolled in clinical trials
- Patients discharged on day of arrival
- Patients discharged to another hospital on day of or day after arrival
- Patients who left against medical advice on day of or day after arrival
- Patients who expired on day of or day after arrival
- Patients with a documented *Reason for No Aspirin on Arrival*

Data Elements:

- *Admission Date*
- *Arrival Date*
- *Birthdate*
- *Clinical Trial*
- *Comfort Measures Only*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-9-CM Principal Diagnosis Code*
- *Reason for No Aspirin on Arrival*

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: None

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

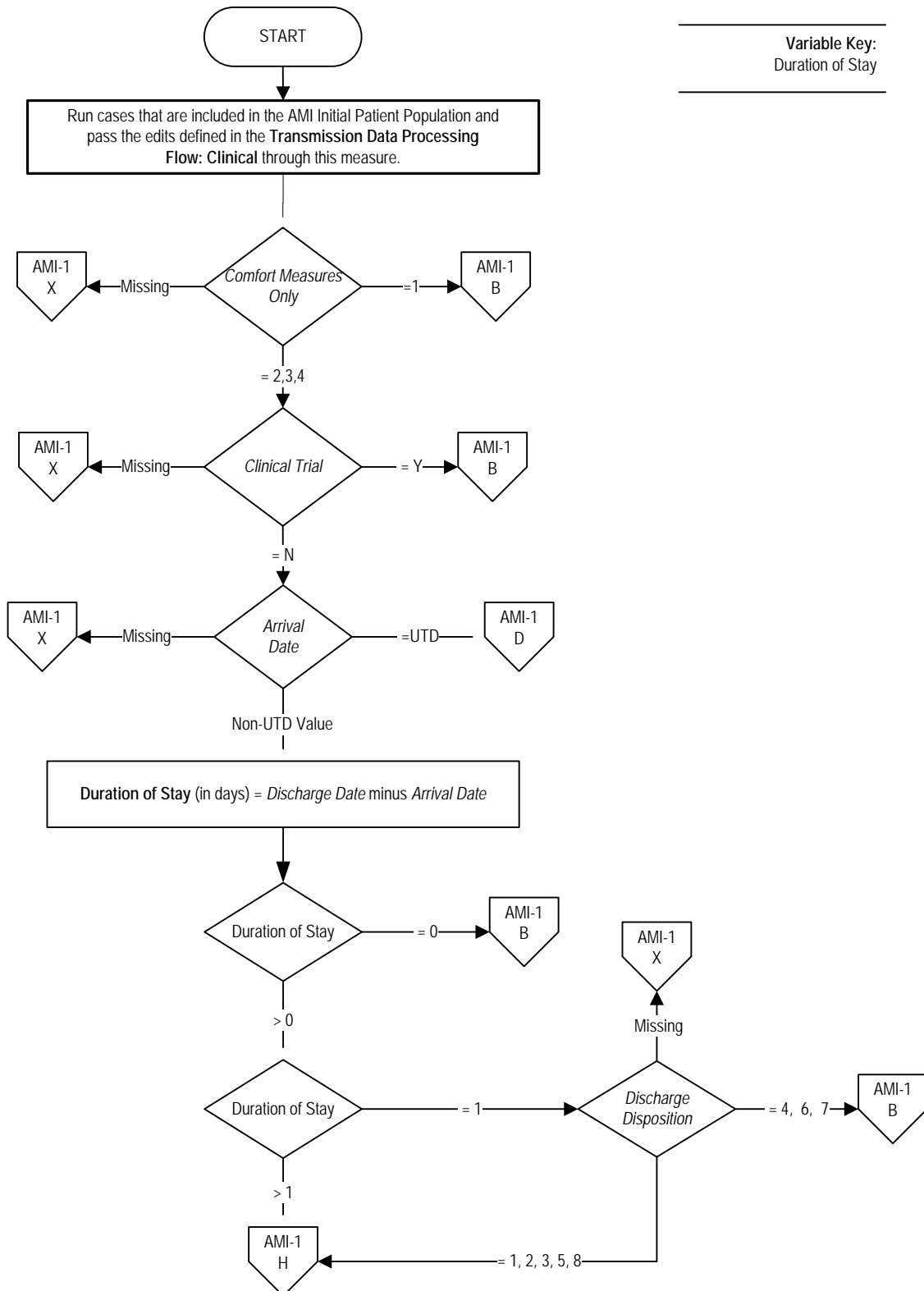
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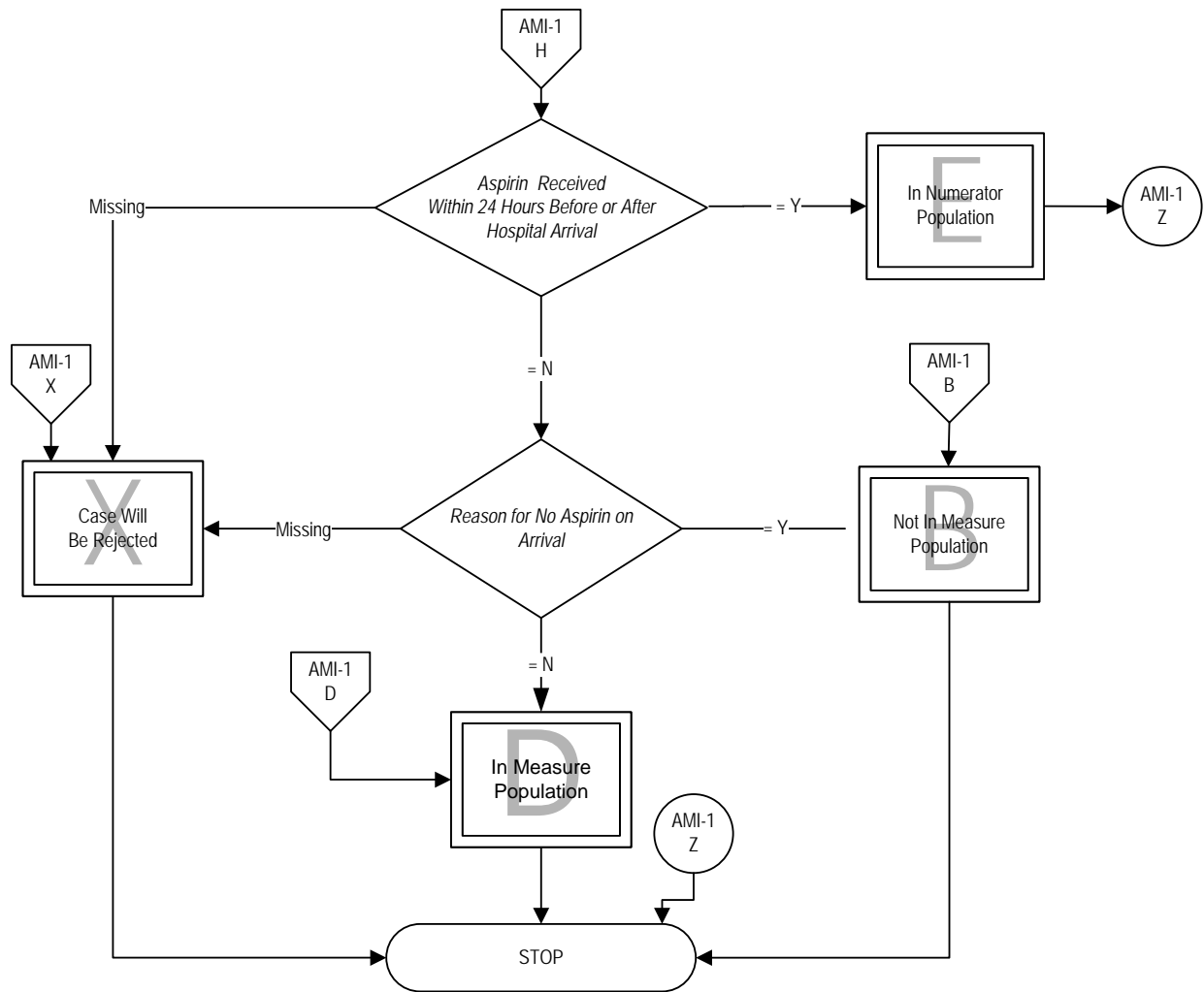
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- Risk of myocardial infarction and death during treatment with low dose aspirin and intravenous heparin in men with unstable coronary artery disease. The RISC Group. *Lancet.* 1990;336(8719):827-830.
- Theroux P, Ouimet H, McCans J et al. Aspirin, heparin, or both to treat acute unstable angina. *N Engl J Med.* 1988;319(17):1105-1111.

AMI-1: Aspirin at Arrival

Numerator: AMI patients who received aspirin within 24 hours before or after hospital arrival.

Denominator: AMI patients.





Acute Myocardial Infarction (AMI)-1: Aspirin at Arrival

Numerator: Acute Myocardial Infarction (AMI) patients who received aspirin within 24 hours before or after hospital arrival.

Denominator: AMI patients.

Variable Key: Duration of Stay

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 Comfort Measures Only
 - a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Comfort Measures Only equals 1, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If Comfort Measures Only equals 2, 3, or 4, continue processing and proceed to Clinical Trial.
3. 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 Arrival Date.
4. 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 the Duration of Stay calculation.
5. Calculate Duration of Stay. Duration of Stay, in days, is equal to the Discharge Date minus the Arrival Date.

6. Check Duration of Stay
 - a. If the Duration of Stay is equal to zero, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - b. If the Duration of Stay is equal to one, continue processing and proceed to Discharge Disposition.
 - c. If the Duration of Stay is greater than one, continue processing and proceed to step 8 to check Aspirin Received Within 24 Hours Before or After Hospital Arrival. Do not check Discharge Disposition.
7. Check Discharge Disposition only if Duration of Stay is equal to one.
 - a. If Discharge Disposition is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If the Discharge Disposition is equal to 4, 6 or 7, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If the Discharge Disposition is equal to 1, 2, 3, 5 or 8, continue processing and proceed to Aspirin Received Within 24 Hours Before or After Hospital Arrival.
8. Check Aspirin Received Within 24 Hours Before or After Hospital Arrival
 - a. If Aspirin Received Within 24 Hours Before or After Hospital Arrival is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Aspirin Received Within 24 Hours Before or After Hospital Arrival equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
 - c. If Aspirin Received Within 24 Hours Before or After Hospital Arrival equals No, continue processing and proceed to Reason for No Aspirin on Arrival.
9. Check Reason for No Aspirin on Arrival
 - a. If Reason for No Aspirin on Arrival is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Reason for No Aspirin on Arrival 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 Reason for No Aspirin on Arrival equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop Processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID#: AMI-2

Performance Measure Name: Aspirin Prescribed at Discharge

Description: Acute myocardial infarction (AMI) patients who are prescribed aspirin at hospital discharge

Rationale: Aspirin therapy in patients who have suffered an acute myocardial infarction reduces the risk of adverse events and mortality. Studies have demonstrated that aspirin can reduce this risk by 20% (Antiplatelet Trialists' Collaboration, 1994). National guidelines strongly recommend long-term aspirin for the secondary prevention of subsequent cardiovascular events in eligible older patients discharged after AMI (Antman, 2004; Antman, 2008; Anderson, 2007; and Smith, 2006).

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: AMI patients who are prescribed aspirin at hospital discharge

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:

Aspirin Prescribed at Discharge

Denominator Statement: AMI patients

Included Populations:

Discharges with an *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a documented *Reason for No Aspirin at Discharge*

Data Elements:

- *Admission Date*
- *Birthdate*
- *Clinical Trial*
- *Comfort Measures Only*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-9-CM Principal Diagnosis Code*
- *Reason for No Aspirin at Discharge*

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: None

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:

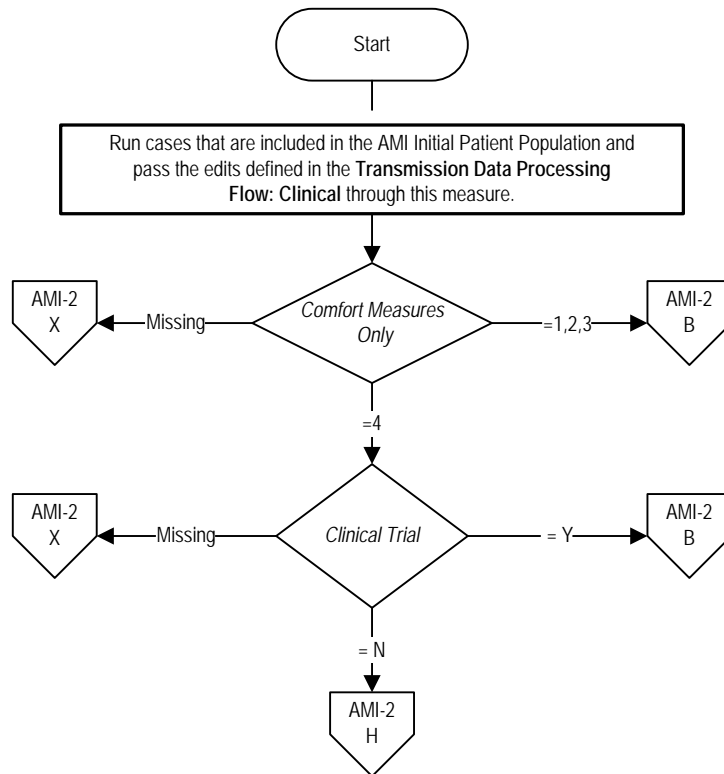
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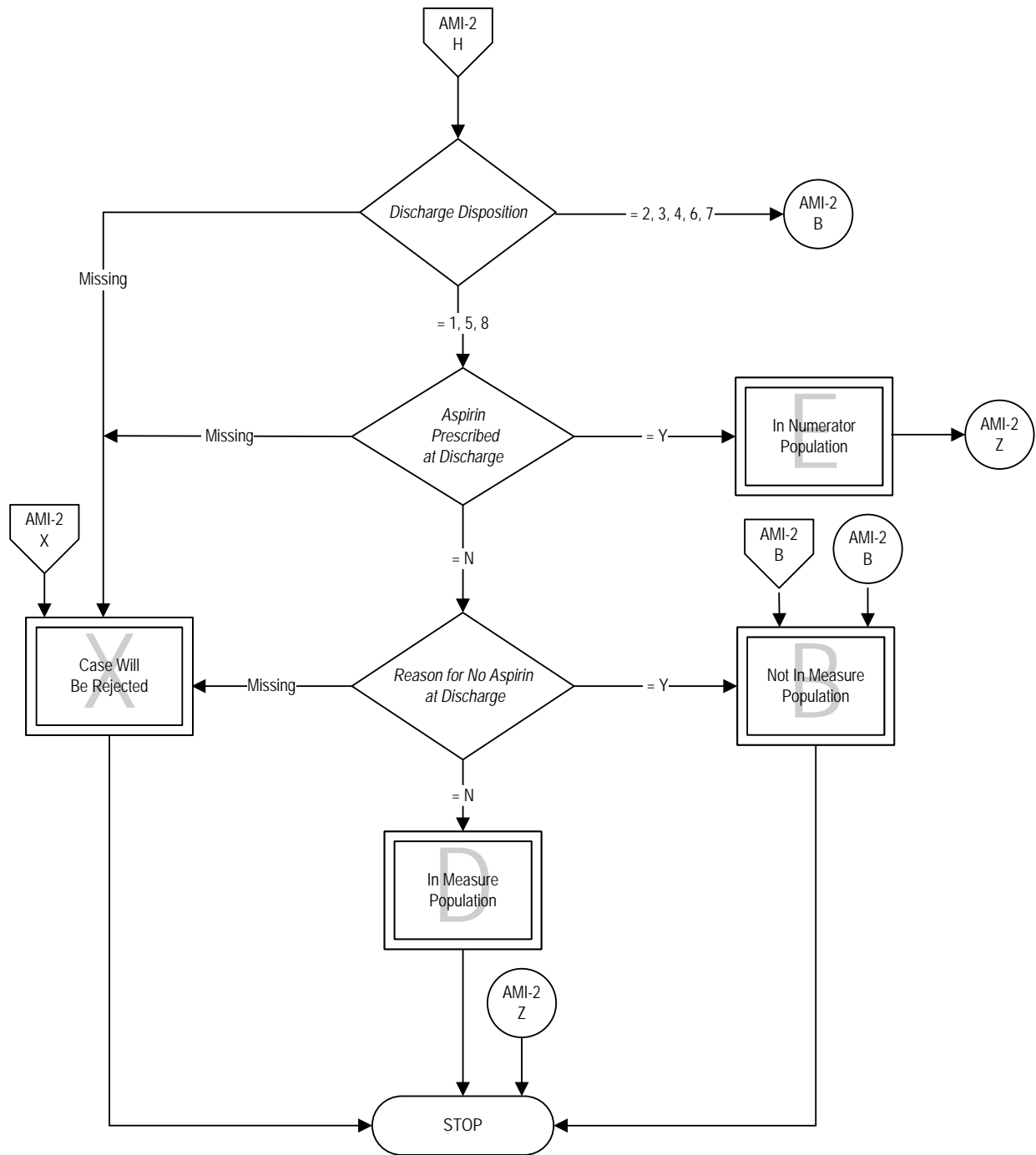
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AMI-2: Aspirin Prescribed at Discharge

Numerator: AMI patients who are prescribed aspirin at hospital discharge.

Denominator: AMI patients.





Acute Myocardial Infarction (AMI)-2: Aspirin Prescribed at Discharge

Numerator: Acute Myocardial Infarction (AMI) patients who are prescribed aspirin at hospital discharge.

Denominator: AMI patients.

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 Comfort Measures Only
 - a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Comfort Measures Only equals 1, 2 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If Comfort Measures Only equals 4, continue processing and proceed to Clinical Trial.
3. 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 Discharge Disposition.
4. Check Discharge Disposition
 - a. If Discharge Disposition is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Discharge Disposition is equal to 2, 3, 4, 6 or 7, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If Discharge Disposition is equal to 1, 5 or 8, continue processing and proceed to Aspirin Prescribed at Discharge.
5. Check Aspirin Prescribed at Discharge
 - a. If Aspirin Prescribed at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If Aspirin Prescribed at Discharge equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
 - c. If Aspirin Prescribed at Discharge equals No, continue processing and proceed to Reason for No Aspirin at Discharge.
6. Check Reason for No Aspirin at Discharge
- a. If Reason for No Aspirin at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Reason for No Aspirin at Discharge 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 Reason for No Aspirin at Discharge equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop Processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form Collected For: The Joint Commission Only CMS Voluntary Only

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID#: AMI-3

Performance Measure Name: ACEI or ARB for LVSD

Description: Acute myocardial infarction (AMI) patients with left ventricular systolic dysfunction (LVSD) who are prescribed an ACEI or ARB at hospital discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular systolic (LVS) function consistent with moderate or severe systolic dysfunction.

Rationale: ACE inhibitors reduce mortality and morbidity in patients with left ventricular systolic dysfunction (LVSD) after AMI (Flather, 2000; Pfeffer, 1992; Torp-Peterson, 1999; and Yusuf, 1992). Clinical trials have also established ARB therapy as an acceptable alternative to ACEI, especially in patients with heart failure and/or LVSD who are ACEI intolerant (Granger, 2003 and Pfeffer, 2003). National guidelines strongly recommend ACEI for patients hospitalized with AMI who have either clinical heart failure or LVSD (Antman, 2004 and Anderson, 2007). Guideline committees have also supported the inclusion of ARBs in performance measures for AMI (Antman, 2004; Antman, 2008; Anderson, 2007; and Smith, 2006).

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: AMI patients who are prescribed an ACEI or ARB at hospital discharge.

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:

- *ACEI Prescribed at Discharge*
- *ARB Prescribed at Discharge*

Denominator Statement: AMI patients with LVSD

Included Populations: Discharges with:

- An *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1

AND

- Chart documentation of a LVEF less than 40% or a narrative description of LVS function consistent with moderate or severe systolic dysfunction

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a documented *Reason for No ACEI and No ARB at Discharge*

Data Elements:

- *Admission Date*
- *Birthdate*
- *Clinical Trial*
- *Comfort Measures Only*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-9-CM Principal Diagnosis Code*
- *LVSD*
- *Reason for No ACEI and No ARB at Discharge*

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: None

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:

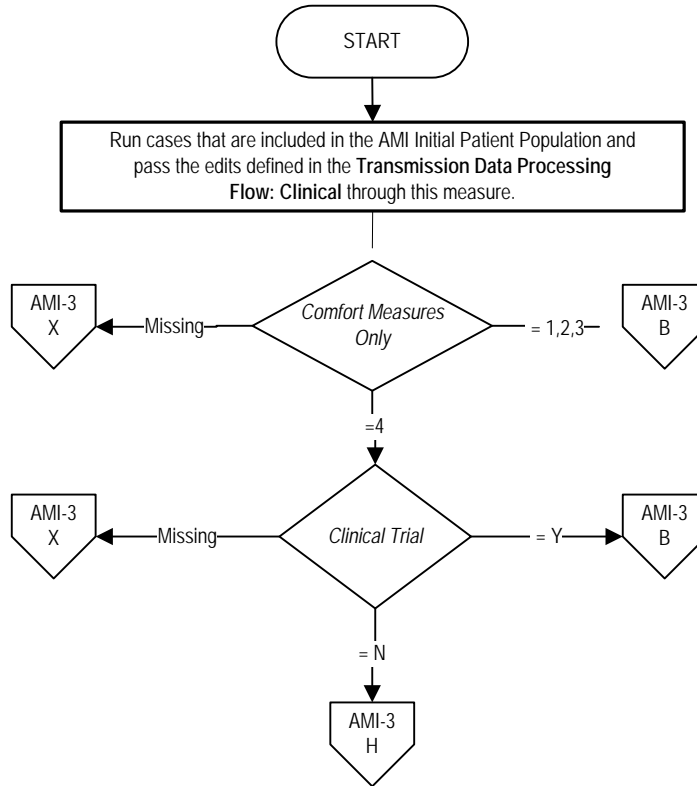
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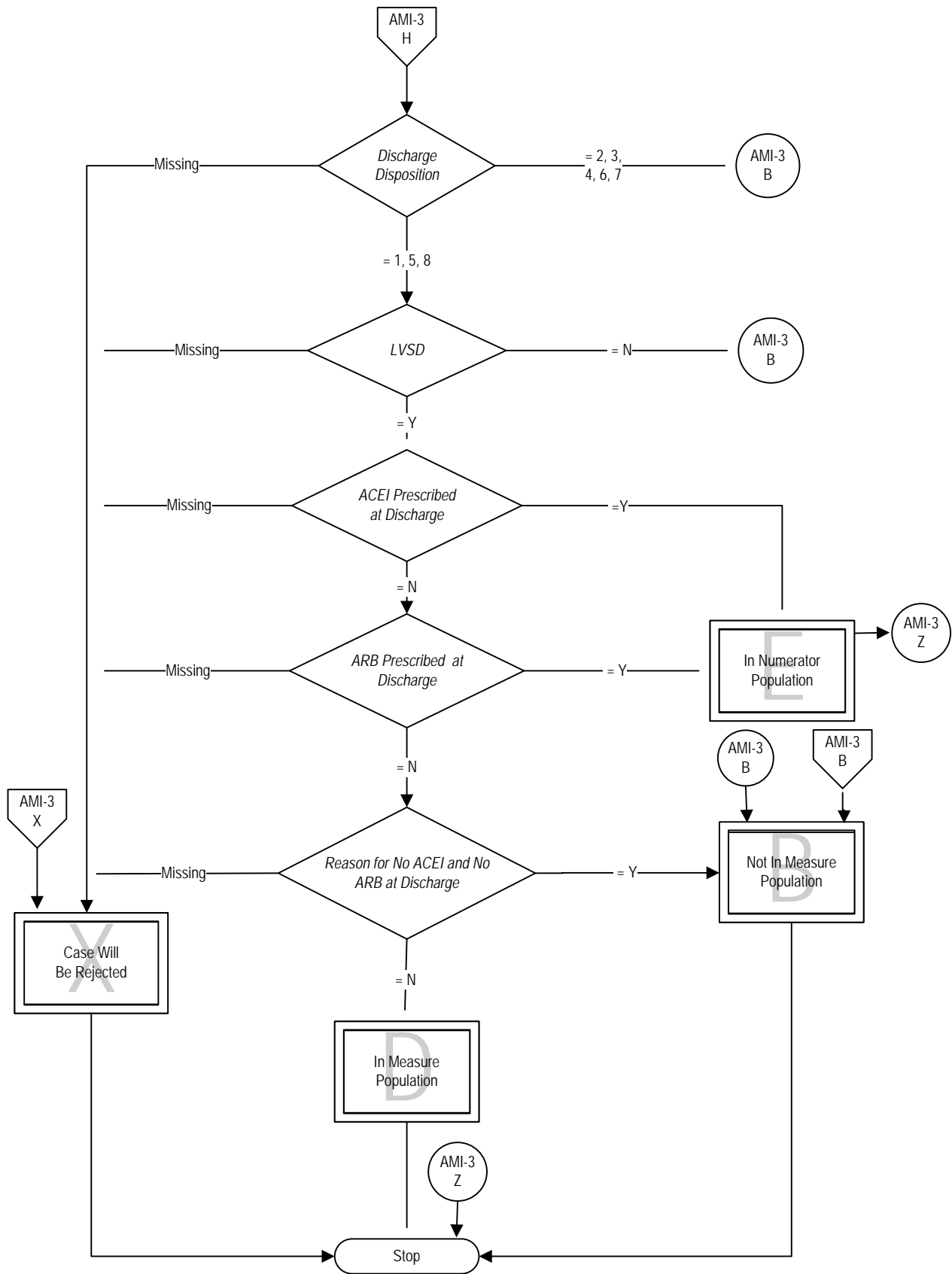
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AMI-3: ACEI or ARB for LVSD

Numerator: AMI patients who are prescribed an ACEI or ARB at hospital discharge.

Denominator: AMI patients with LVSD.





Acute Myocardial Infarction (AMI)-3: Angiotensin Converting Enzyme Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB) for Left Ventricular Systolic Dysfunction (LVSD)

Numerator: Acute Myocardial Infarction (AMI) patients who are prescribed an ACEI or ARB at hospital discharge.

Denominator: AMI patients with LVSD.

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 Comfort Measures Only
 - a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Comfort Measures Only equals 1, 2 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If Comfort Measures Only equals 4, continue processing and proceed to Clinical Trial.
3. 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 Discharge Disposition.
4. Check Discharge Disposition
 - a. If Discharge Disposition is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If the Discharge Disposition is equal to 2, 3, 4, 6 or 7, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If the Discharge Disposition is equal to 1, 5 or 8, continue processing and proceed to LVSD.
5. Check LVSD

- a. If LVSD is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If LVSD 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 LVSD equals Yes, continue processing and proceed to ACEI Prescribed at Discharge.
6. Check ACEI Prescribed at Discharge
- a. If ACEI Prescribed at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If ACEI Prescribed at Discharge equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
 - c. If ACEI Prescribed at Discharge equals No, continue processing and proceed to ARB Prescribed at Discharge.
7. Check ARB Prescribed at Discharge
- a. If ARB Prescribed at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If ARB Prescribed at Discharge equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
 - c. If ARB Prescribed at Discharge equals No, continue processing and proceed to Reason for No ACEI and No ARB at Discharge.
8. Check Reason for No ACEI and No ARB at Discharge
- a. If Reason for No ACEI or No ARB at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Reason for No ACEI or No ARB at Discharge 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 Reason for No ACEI or No ARB at Discharge equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Last Updated: Version 4.0a

AMI 4 Adult Smoking Cessation Advice/Counseling was retired effective with January 01, 2012 discharges

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form
Collected For: The Joint Commission Only
CMS Voluntary Only

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID#: AMI-5

Performance Measure Name: Beta-Blocker Prescribed at Discharge

Description: Acute myocardial infarction (AMI) patients who are prescribed a beta-blocker at hospital discharge

Rationale: Long-term use of beta-blockers for patients who have suffered an acute myocardial infarction can reduce mortality and morbidity. Studies have demonstrated that the use of beta-blockers is associated with about a 20% reduction in this risk (Yusuf, 1988), and there is evidence of effectiveness in broad populations of patients with AMI (Krumholz, 1998). National guidelines strongly recommend long-term beta-blocker therapy for the secondary prevention of subsequent cardiovascular events in patients discharged after AMI (Antman, 2004; Antman, 2008; Anderson, 2007; and Smith 2006).

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: AMI patients who are prescribed a beta-blocker at hospital discharge.

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:

Beta-Blocker Prescribed at Discharge

Denominator Statement: AMI patients

Included Populations:

Discharges with an *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a documented *Reason for No Beta-Blocker at Discharge*

Data Elements:

- *Admission Date*
- *Birthdate*
- *Clinical Trial*
- *Comfort Measures Only*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-9-CM Principal Diagnosis Code*
- *Reason for No Beta-Blocker at Discharge*

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: None

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.

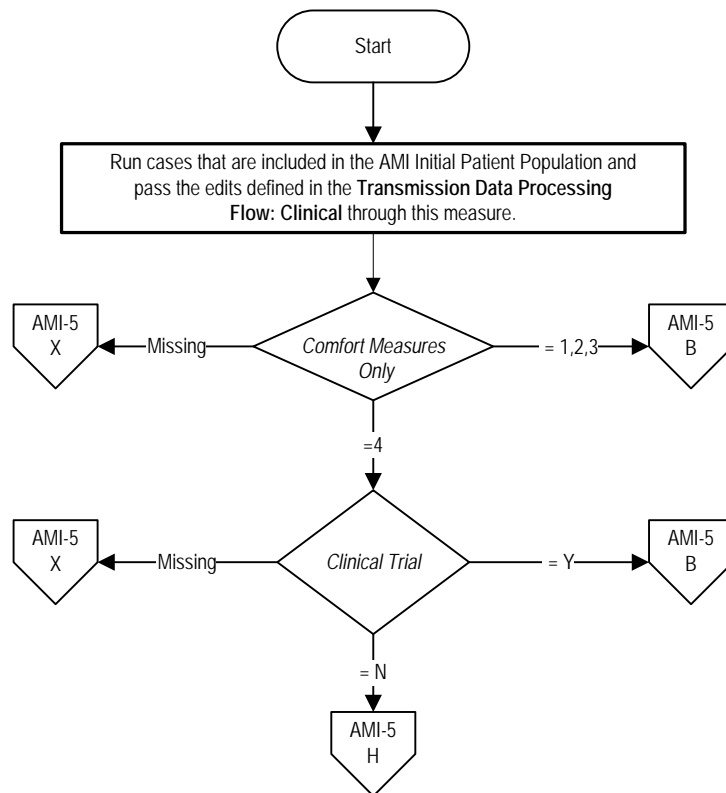
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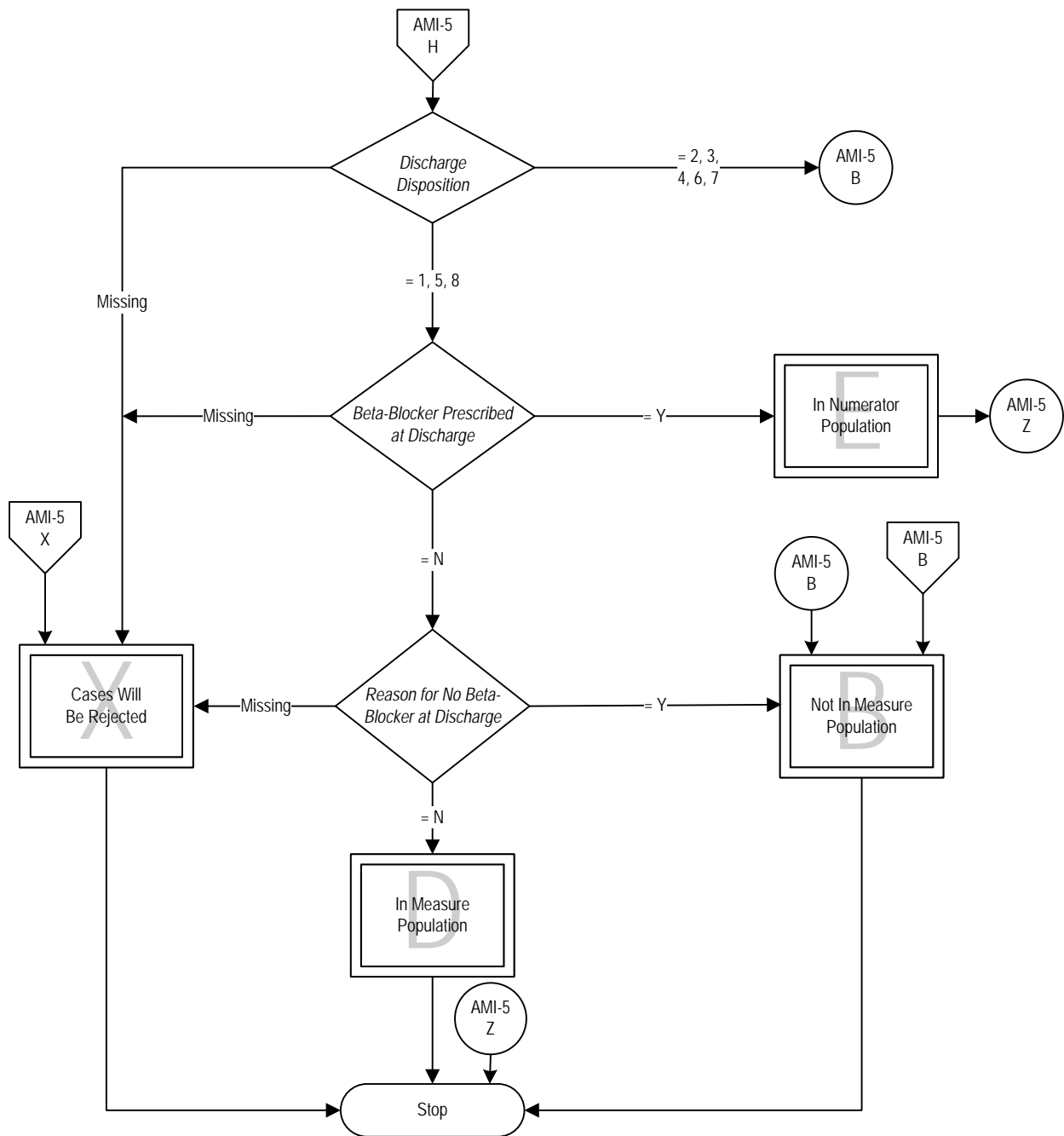
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AMI-5: Beta-Blocker Prescribed at Discharge

Numerator: AMI patients who are prescribed a beta-blocker at hospital discharge.

Denominator: AMI patients.





Acute Myocardial Infarction (AMI)-5: Beta-Blocker Prescribed at Discharge

Numerator: Acute Myocardial Infarction (AMI) patients who are prescribed a beta-blocker at hospital discharge.

Denominator: AMI patients.

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 Comfort Measures Only
 - a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Comfort Measures Only equals 1, 2 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If Comfort Measures Only equals 4, continue processing and proceed to Clinical Trial.
3. 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 Discharge Disposition.
4. Check Discharge Disposition
 - a. If Discharge Disposition is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If the Discharge Disposition is equal to 2, 3, 4, 6 or 7, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing.
 - c. If the Discharge Disposition is equal to 1, 5 or 8, continue processing and proceed to Beta-Blocker Prescribed at Discharge.
5. Check Beta-Blocker Prescribed at Discharge
 - a. If Beta-Blocker Prescribed at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If Beta-Blocker Prescribed at Discharge equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
 - c. If Beta-Blocker Prescribed at Discharge equals No, continue processing and proceed to Reason for No Beta-Blocker at Discharge.
6. Check Reason for No Beta-Blocker at Discharge
- a. If Reason for No Beta-Blocker at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Reason for No Beta-Blocker at Discharge 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 Reason for No Beta-Blocker at Discharge equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Measure Information Form

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID#: AMI-7

Performance Measure Name: Median Time to Fibrinolysis

Description: Median time from arrival to administration of fibrinolytic therapy in acute myocardial infarction (AMI) patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time

Rationale: Time to fibrinolytic therapy is a strong predictor of outcome in patients with an acute myocardial infarction. Nearly 2 lives per 1000 patients are lost per hour of delay (Fibrinolytic Therapy Trialists' Collaborative Group, 1994). National guidelines recommend that fibrinolytic therapy be given within 30 minutes of hospital arrival in patients with ST-elevation myocardial infarction (Antman, 2004).

Type of Measure: Process

Improvement Noted As: A decrease in the median value

Continuous Variable Statement: Time (in minutes) from hospital arrival to administration of fibrinolytic therapy in patients with ST-segment elevation or LBBB on the ECG performed closest to hospital arrival.

Included Populations: Discharges with:

- An ICD-9-CM Principal Diagnosis Code for AMI as defined in Appendix A, Table 1.1
- AND**
- ST-segment elevation or LBBB on the ECG performed closest to hospital arrival
- AND**
- Fibrinolytic therapy within 6 hours after hospital arrival
- AND**
- Fibrinolytic therapy is primary reperfusion therapy

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 who did not receive fibrinolytic therapy within 30 minutes and had a reason for delay documented by a physician/advanced practice nurse/physician assistant (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*
- *Fibrinolytic Administration Date*
- *Fibrinolytic Administration Time*
- *ICD-9-CM Principal Diagnosis Code*
- *Initial ECG Interpretation*
- *Reason for Delay in Fibrinolytic Therapy*
- *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 median time to fibrinolysis should be analyzed in conjunction with the measure rate for fibrinolysis received within 30 minutes of hospital arrival (AMI-7a). These measures, used together, will assist in understanding the median time to fibrinolysis and will identify the number of AMI patients that are receiving fibrinolysis within 30 minutes of hospital arrival and potential opportunities for improvement to decrease the median time to fibrinolysis.

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

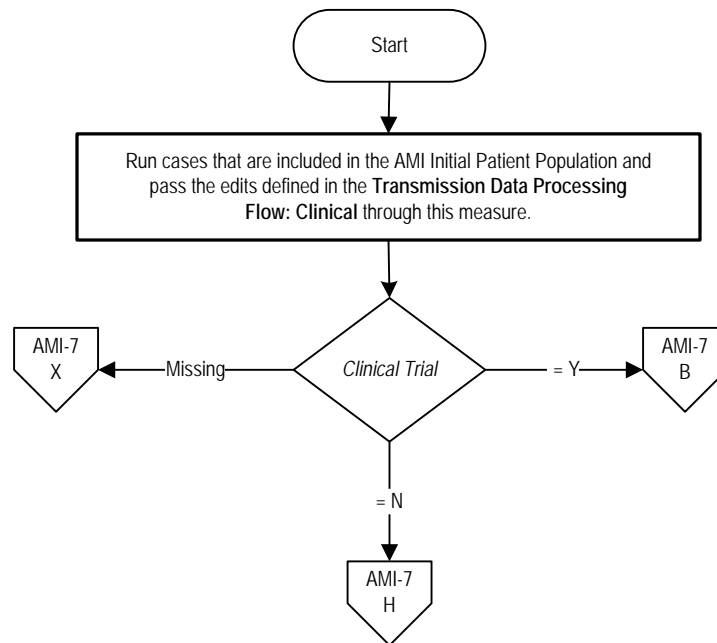
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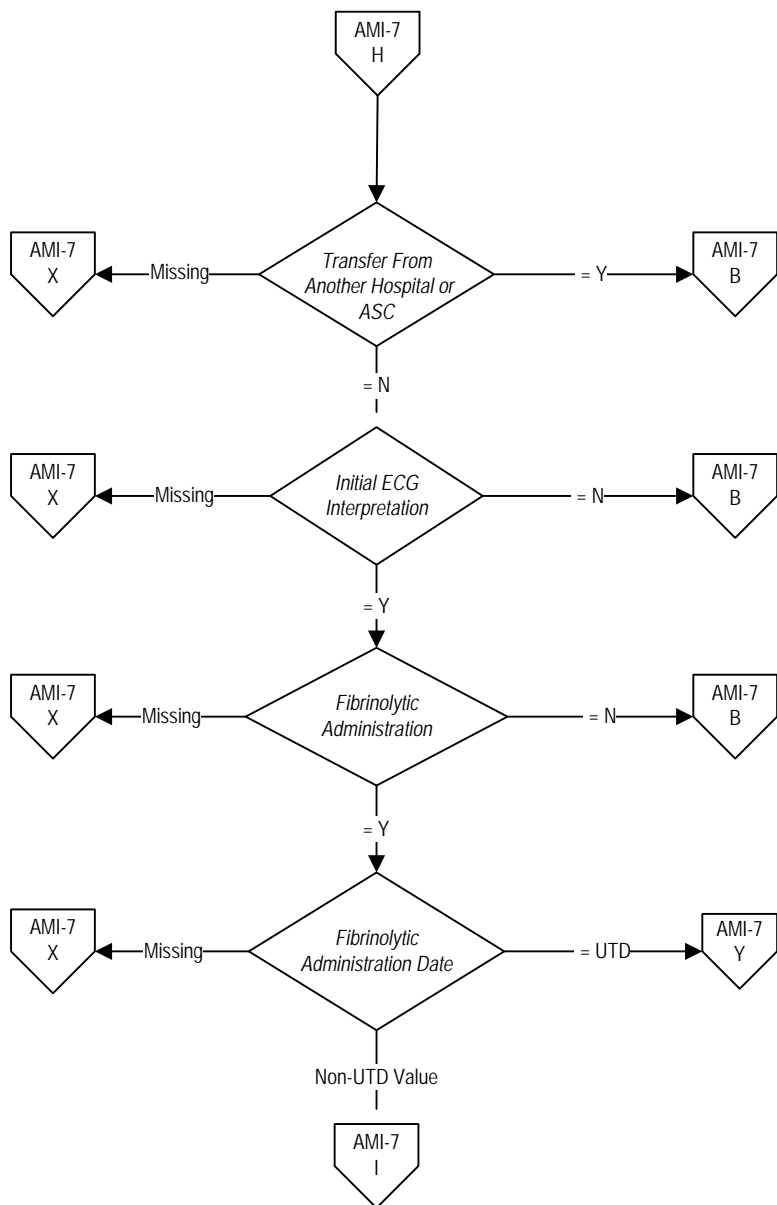
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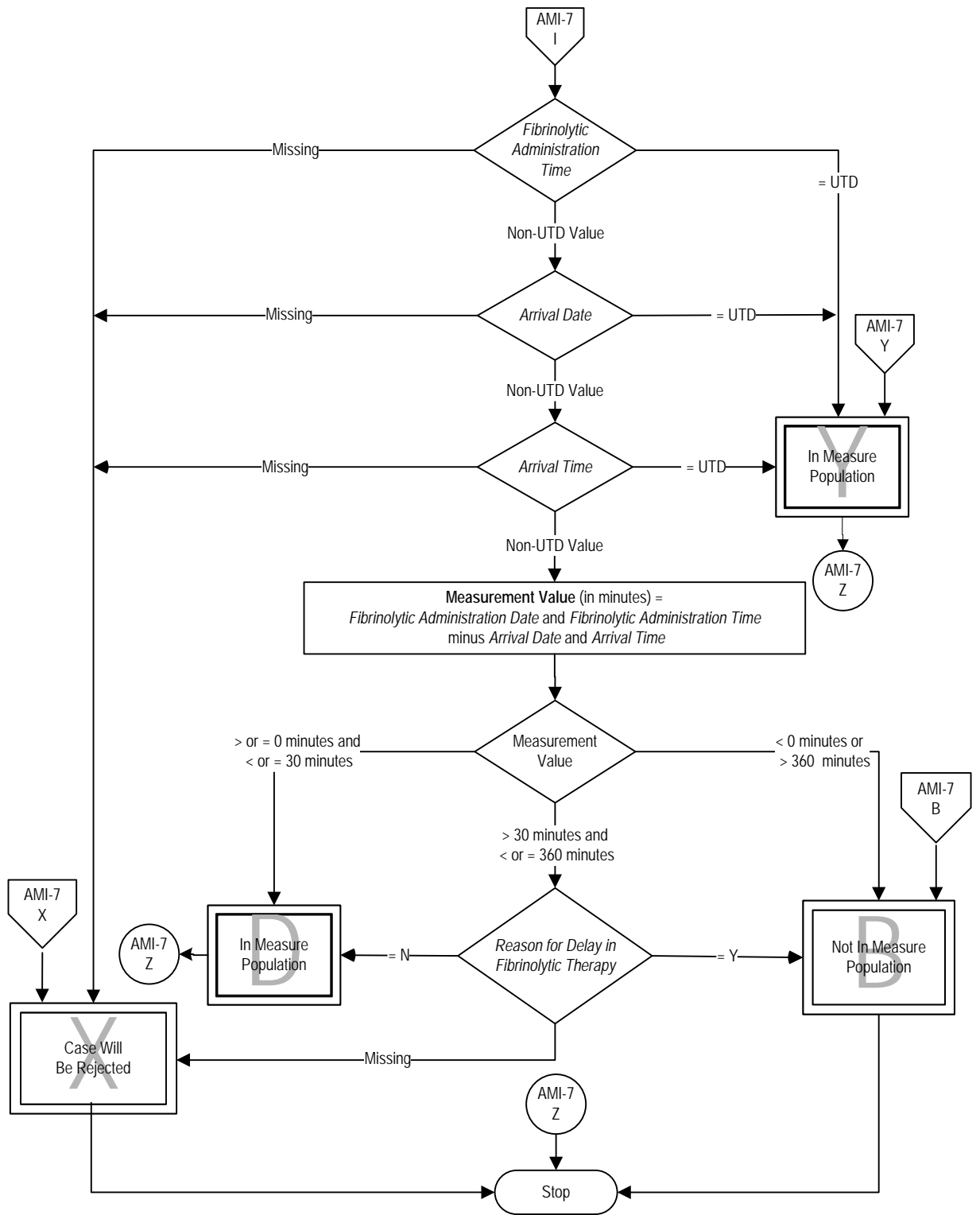
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AMI-7: Median Time to Fibrinolysis

Continuous Variable Statement: Time (in minutes) from hospital arrival to administration of fibrinolytic therapy in patients with ST-segment elevation or LBBB on the ECG performed closest to hospital arrival.







Note: There will be no category assignment E for this measure because it is a continuous variable.

Acute Myocardial Infarction (AMI)-7: Median Time to Fibrinolysis

Continuous Variable Statement: Time (in minutes) from hospital arrival to administration of fibrinolytic therapy in patients with ST-segment elevation or Left Bundle Branch Block (LBBB) on the Electrocardiogram (ECG) performed closest to hospital arrival.

1. Start processing. Run cases that are included in the Acute Myocardial Infarction (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 **Yes**, 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 **No**, 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 No, 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 Yes, continue processing and proceed to Fibrinolytic Administration Date.
6. Check Fibrinolytic Administration Date
- a. If Fibrinolytic Administration Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Fibrinolytic Administration Date equals Unable to Determine, the case will proceed to a Measure Category Assignment of Y and will be in the Measure Population. Stop processing.
 - c. If Fibrinolytic Administration Date equals a Non Unable to Determine value, continue processing and proceed to Fibrinolytic Administration Time.
7. Check Fibrinolytic Administration Time
- a. If Fibrinolytic Administration Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Fibrinolytic Administration Time equals Unable to Determine, the case will proceed to a Measure Category Assignment of Y and will be in the Measure Population. Stop processing.
 - c. If Fibrinolytic Administration Time equals a Non Unable to Determine value, continue processing and proceed to Arrival Date.
8. 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 Y 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.
9. 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 Y 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 Measurement Value calculation.

10. Calculate Measurement Value. Measurement Value, in minutes, is equal to the Fibrinolytic Administration Date and Fibrinolytic Administration Time minus the Arrival Date and Arrival Time.
11. Check Measurement Value
 - a. If the Measurement Value is less than zero minutes or greater than 360 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 Measurement Value is greater than or equal to zero minutes and less than or equal to 30 minutes, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
 - c. If the Measurement Value is greater than 30 minutes and less than or equal to 360 minutes, continue processing and proceed to Reason for Delay in Fibrinolytic Therapy.
12. Check Reason for Delay in Fibrinolytic Therapy
 - a. If Reason for Delay in Fibrinolytic Therapy 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 Fibrinolytic Therapy 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 Fibrinolytic Therapy is No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Note: There will be no Measure Category Assignment E for this measure because it is a continuous variable.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID#: AMI-7a

Performance Measure Name: Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival

Description: Acute myocardial infarction (AMI) patients with ST-segment elevation or LBBB on the ECG closest to arrival time receiving fibrinolytic therapy during the hospital stay and having a time from hospital arrival to fibrinolysis of 30 minutes or less

Rationale: Time to fibrinolytic therapy is a strong predictor of outcome in patients with an acute myocardial infarction. Nearly 2 lives per 1000 patients are lost per hour of delay (Fibrinolytic Therapy Trialists' Collaborative Group, 1994). National guidelines recommend that fibrinolytic therapy be given within 30 minutes of hospital arrival in patients with ST-elevation myocardial infarction (Antman, 2004).

Type of Measure: Process

Improvement Noted as: An increase in the rate

Numerator Statement: AMI patients whose time from hospital arrival to fibrinolysis is 30 minutes or less.

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:

- *Arrival Date*
- *Arrival Time*
- *Fibrinolytic Administration Date*
- *Fibrinolytic Administration Time*

Denominator Statement: AMI patients with ST-elevation or LBBB on ECG who received fibrinolytic therapy.

Included Populations: Discharges with:

- An *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1

AND

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

AND

- Fibrinolytic therapy within 6 hours after hospital arrival

AND

- Fibrinolytic therapy is primary reperfusion therapy

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 who did not receive fibrinolytic therapy within 30 minutes and had a reason for delay documented by a physician/advanced practice nurse/physician assistant (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*
- *Fibrinolytic Administration Date*
- *Fibrinolytic Administration Time*
- *ICD-9-CM Principal Diagnosis Code*
- *Initial ECG Interpretation*
- *Reason for Delay in Fibrinolytic Therapy*
- *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 fibrinolytic agent received within 30 minutes of hospital arrival should be analyzed in conjunction with the median time to fibrinolysis measure (AMI-7). These measures, used together, will assist in understanding the number of AMI patients that are receiving fibrinolysis within 30 minutes of hospital arrival and will identify the hospital's median time to fibrinolysis and potential opportunities for improvement to increase the rate of patients receiving fibrinolysis in 30 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:

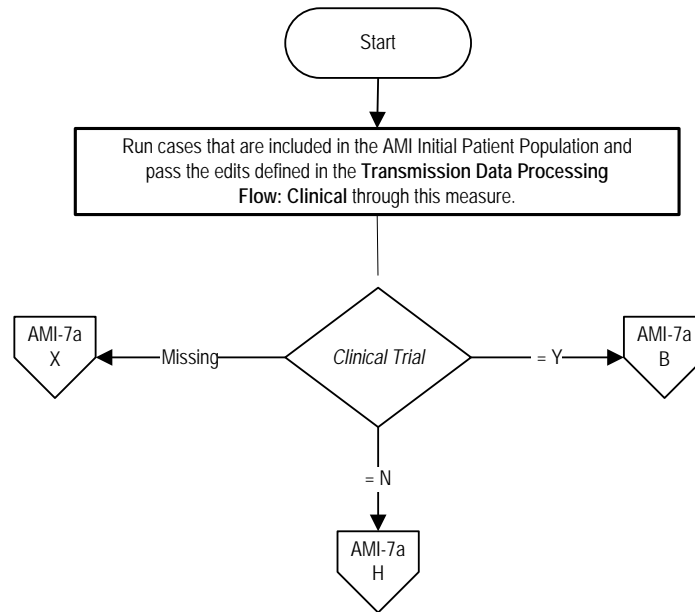
- Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). 2004.
- Fibrinolytic Therapy Trialists' (FTT) Collaborative Group. Indications for fibrinolytic therapy in suspected acute myocardial infarction: collaborative overview of early mortality and major morbidity results from all randomized trials of more than 1000 patients. *Lancet*. 1994;343:311-22.
- 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.

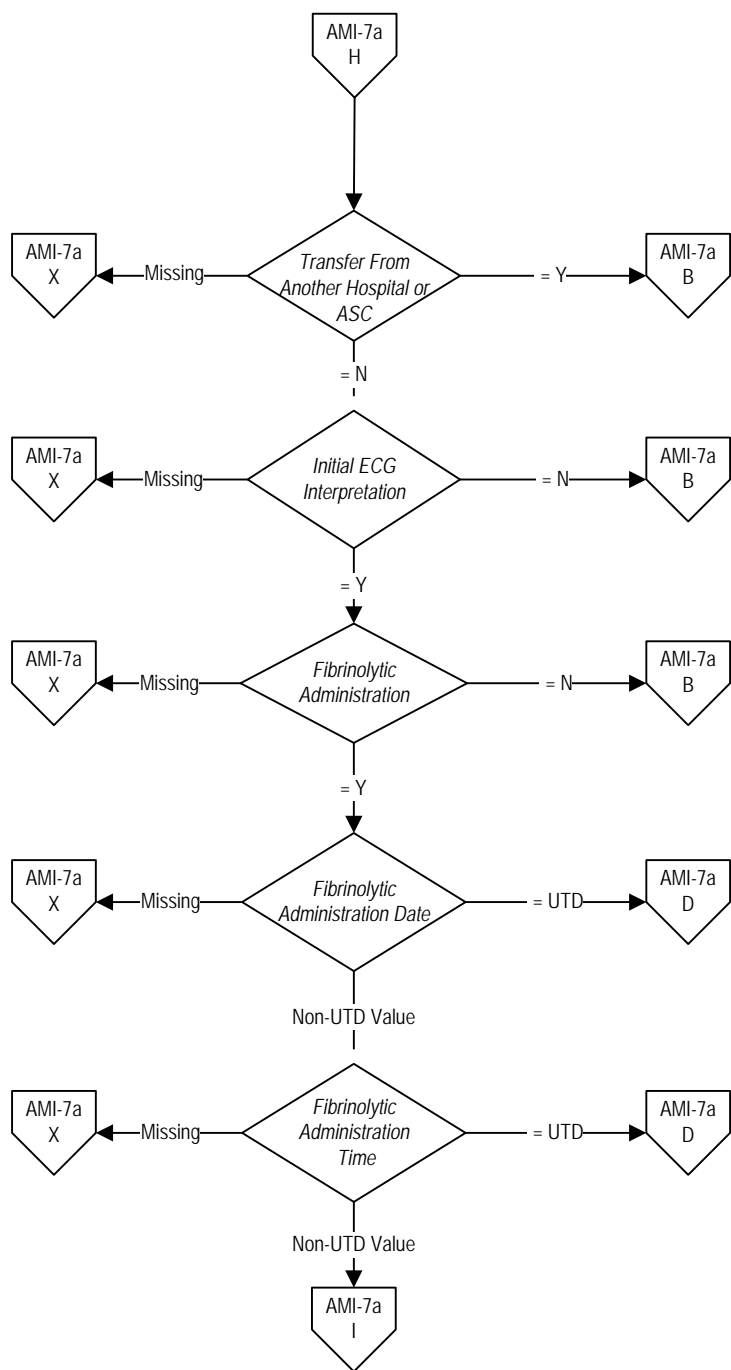
AMI-7a: Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival

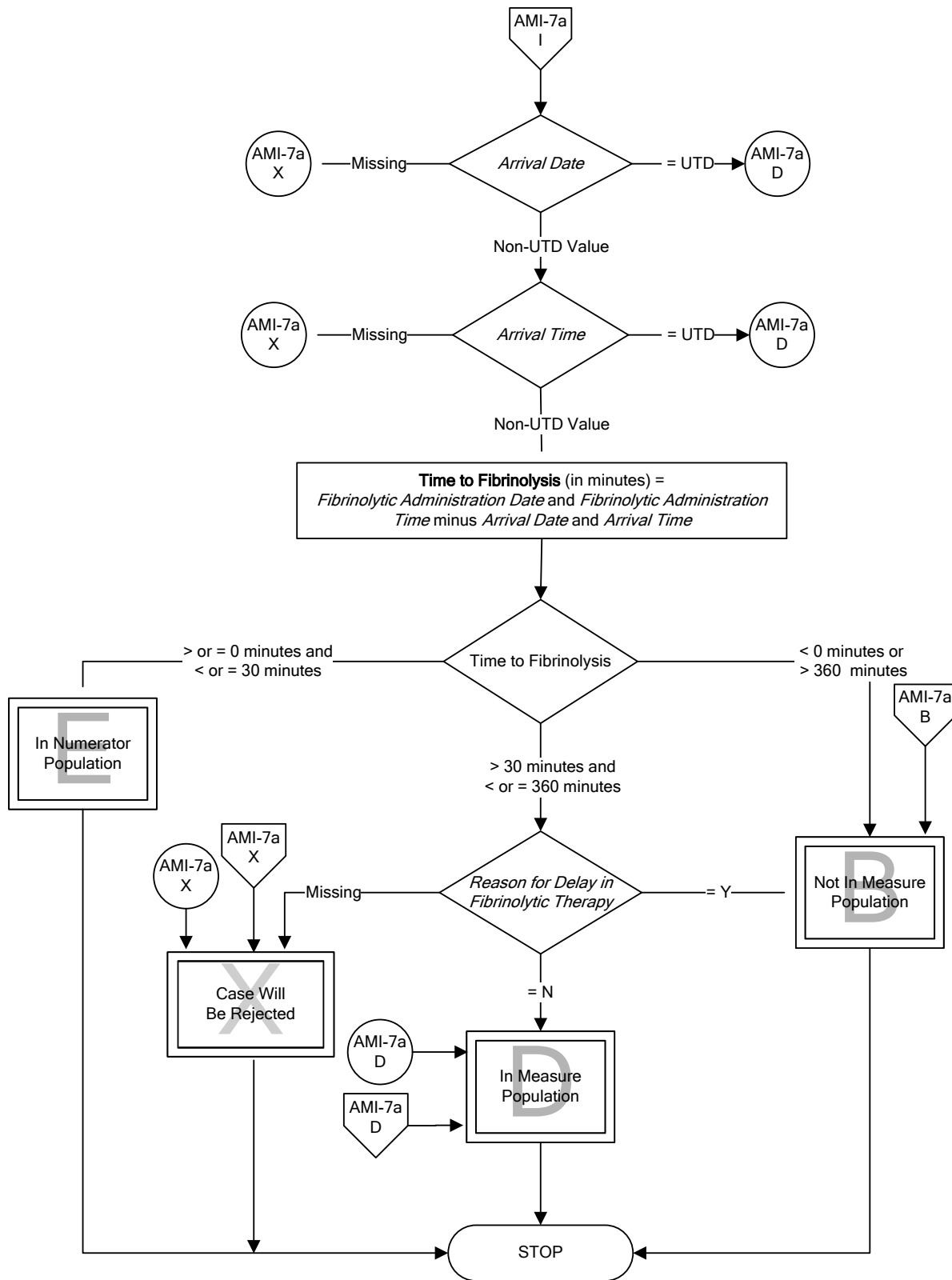
Numerator: AMI patients whose time from hospital arrival to fibrinolysis is 30 minutes or less.

Denominator: AMI patients with ST-elevation or LBBB on ECG who received fibrinolytic therapy.

Variable Key:
Time to Fibrinolysis







Acute Myocardial Infarction (AMI)-7a: Fibrinolytic Therapy Received Within 30 Minutes of Hospital Arrival

Numerator: Acute Myocardial Infarction (AMI) patients whose time from hospital arrival to fibrinolysis is 30 minutes or less.

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

Variable Key: Time to Fibrinolysis

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 **Yes**, 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 **No**, 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 No, 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 Yes, continue processing and proceed to Fibrinolytic Administration Date.

6. Check Fibrinolytic Administration Date
 - a. If Fibrinolytic Administration Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Fibrinolytic Administration 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 Fibrinolytic Administration Date equals a Non Unable to Determine value, continue processing and proceed to Fibrinolytic Administration Time.

7. Check Fibrinolytic Administration Time
 - a. If Fibrinolytic Administration Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Fibrinolytic Administration 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 Fibrinolytic Administration Time equals a Non Unable to Determine value, continue processing and proceed to Arrival Date.

8. 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.

9. 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 Fibrinolysis calculation.
- 10. Calculate Time to Fibrinolysis. Time to Fibrinolysis, in minutes, is equal to the Fibrinolytic Administration Date and Fibrinolytic Administration Time minus the Arrival Date and Arrival Time.
- 11. Check Time to Fibrinolysis
 - a. If the Time to Fibrinolysis is less than zero minutes or greater than 360 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 Fibrinolysis is greater than or equal to zero minutes and less than or equal to 30 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 Fibrinolysis is greater than 30 minutes and less than or equal to 360 minutes, continue processing and proceed to Reason for Delay in Fibrinolytic Therapy.
- 12. Check Reason for Delay in Fibrinolytic Therapy
 - a. If Reason for Delay in Fibrinolytic Therapy 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 Fibrinolytic Therapy 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 Fibrinolytic Therapy is No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Measure Information Form

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID#: AMI-8

Performance Measure Name: Median Time to Primary PCI

Description: Median time from hospital arrival to primary percutaneous coronary intervention (PCI) in acute myocardial infarction (AMI) patients with ST-segment elevation or left bundle branch block (LBBB) on the electrocardiogram (ECG) performed closest to hospital arrival time

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: A decrease in the median value

Continuous Variable Statement: Time (in minutes) from hospital arrival to primary PCI in patients with ST-segment elevation or LBBB on the ECG performed closest to hospital arrival.

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 median time to primary PCI should be analyzed in conjunction with the measure rate for primary PCI received within 90 minutes of hospital arrival (AMI-8a). These measures, used together, will assist in understanding the median time to primary PCI, and will identify the number of AMI patients that are receiving primary PCI within 90 minutes of hospital arrival and potential opportunities for improvement to decrease the median time to primary PCI.

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

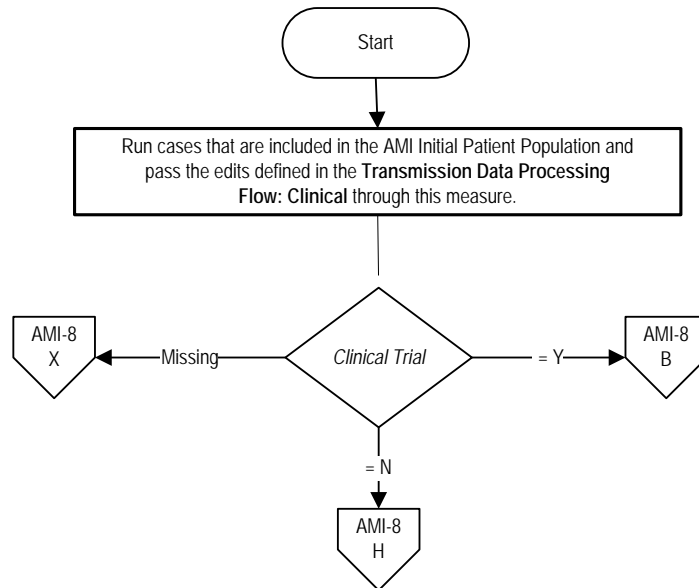
Data Reported As: Aggregate measure of central tendency

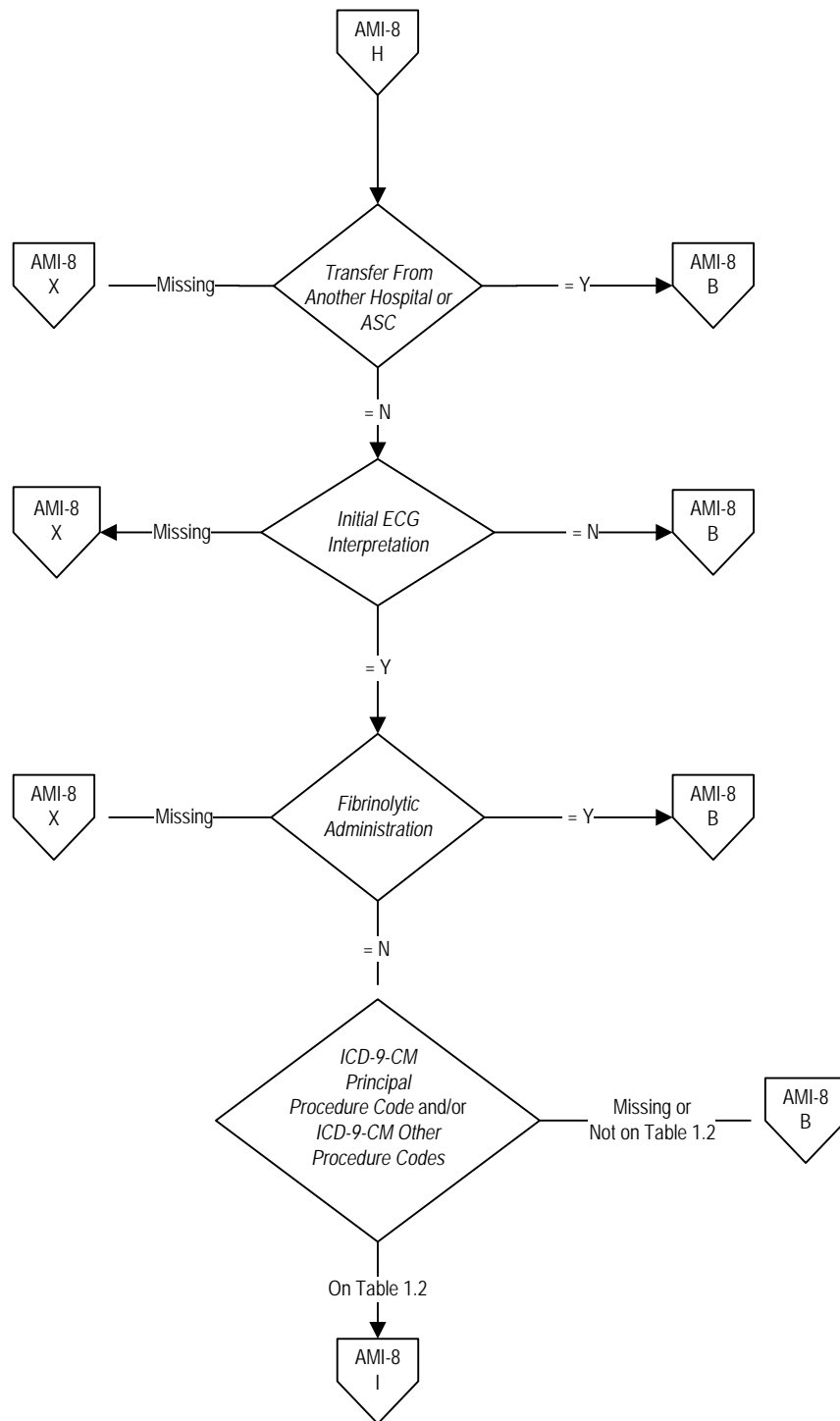
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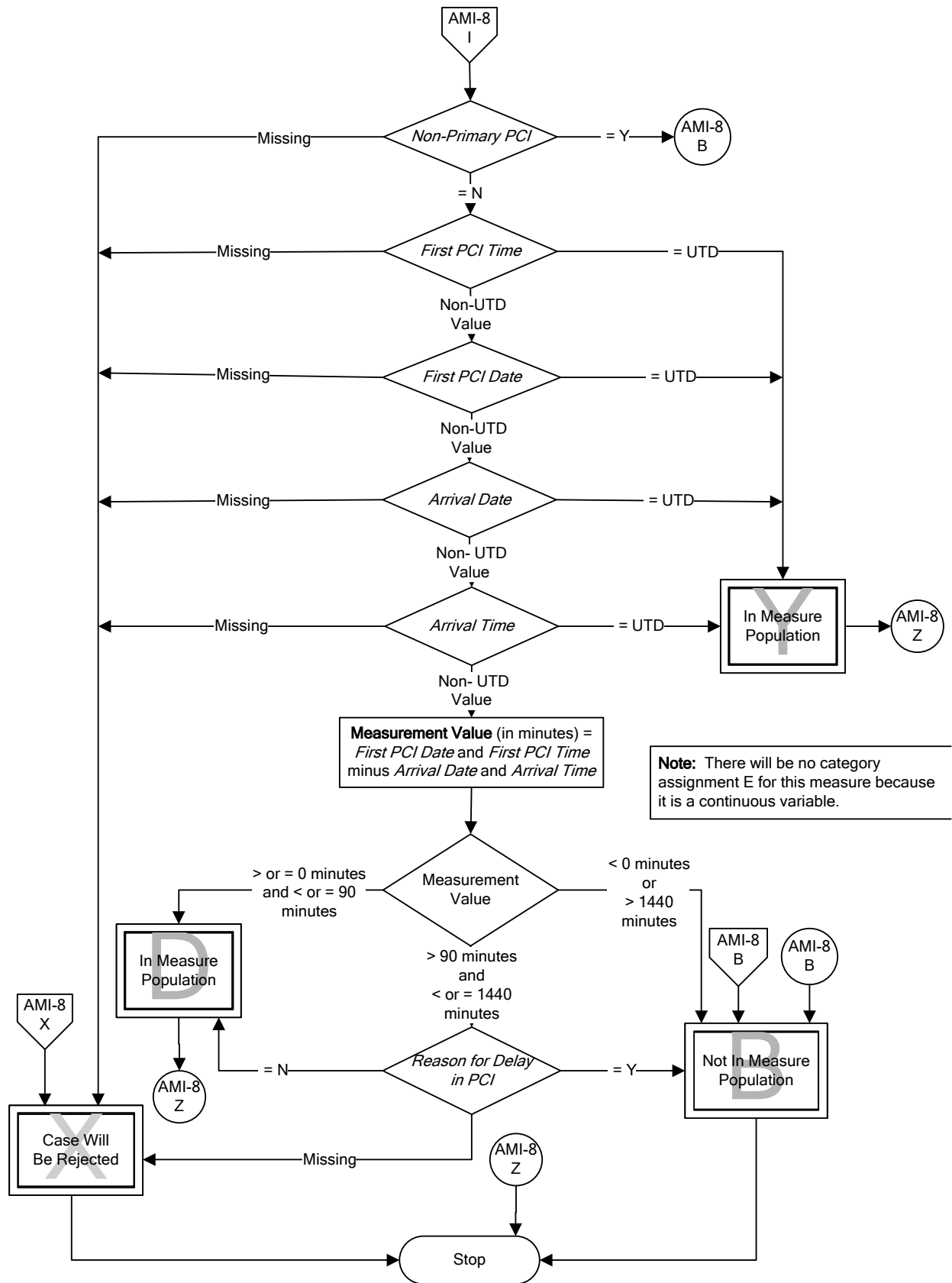
- Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). 2004.
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- 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-8: Median Time to Primary PCI

Continuous Variable Statement: Time (in minutes) from hospital arrival to primary PCI in patients with ST-segment elevation or LBBB on the ECG performed closest to hospital arrival.







Acute Myocardial Infarction (AMI)-8: Median Time to Primary Percutaneous Coronary Intervention (PCI)

Continuous Variable Statement: Time (in minutes) from hospital arrival to primary PCI in patients with ST-segment elevation or Left Bundle Branch Block (LBBB) on the Electrocardiogram (ECG) performed closest to hospital arrival.

1. Start processing. Run cases that are included in the Acute Myocardial Infarction (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 **Yes**, 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 **No**, 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 Y 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 Y 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 Y 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 Y 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 Measurement Value calculation.
12. Calculate Measurement Value. Measurement Value, in minutes, is equal to the First PCI Date and First PCI Time minus the Arrival Date and Arrival Time.
13. Check Measurement Value
- a. If the Measurement Value 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 Measurement Value 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 D and will be in the Measure Population. Stop processing.
 - c. If the Measurement Value 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.

Note: There will be no Measure Category Assignment E for this measure because it is a continuous variable.

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:

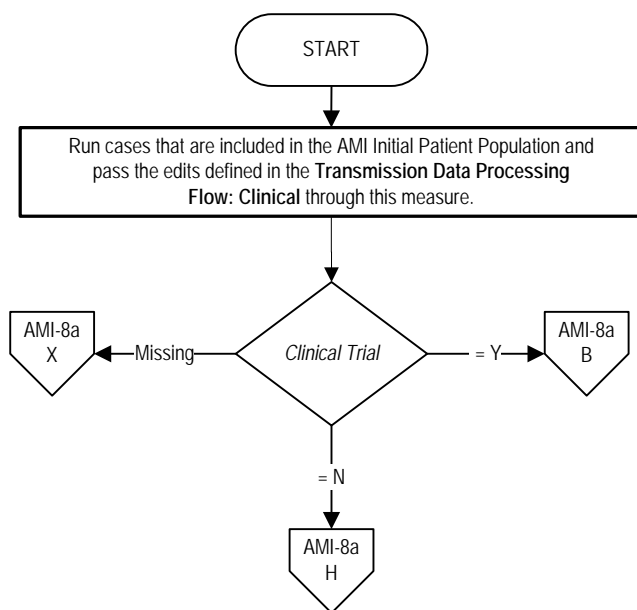
- Antman EM, Anbe DT, Armstrong PW, Bates ER, Green LA, Hand M, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines 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.

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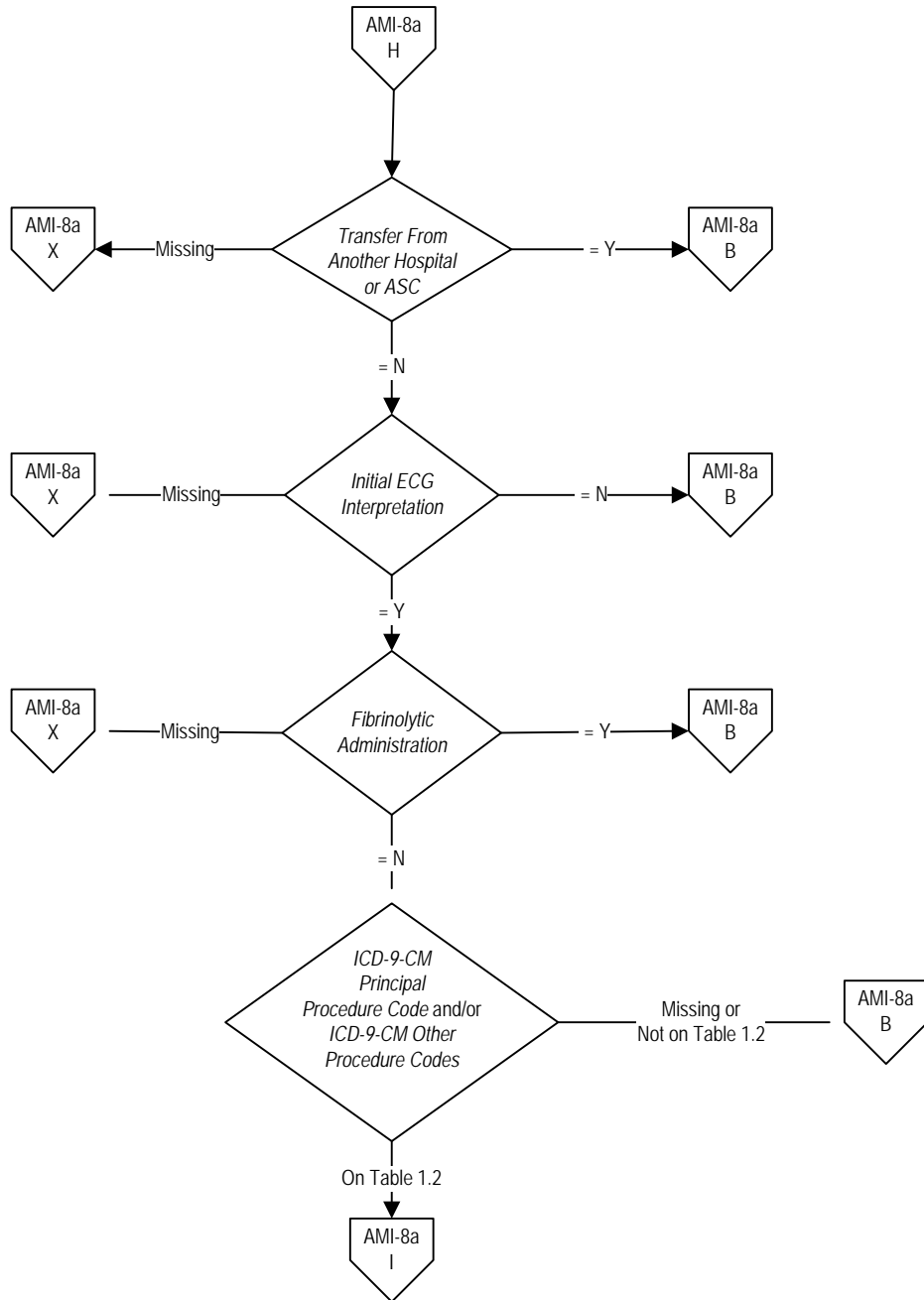
AMI-8a: Primary PCI Received Within 90 Minutes of Hospital Arrival

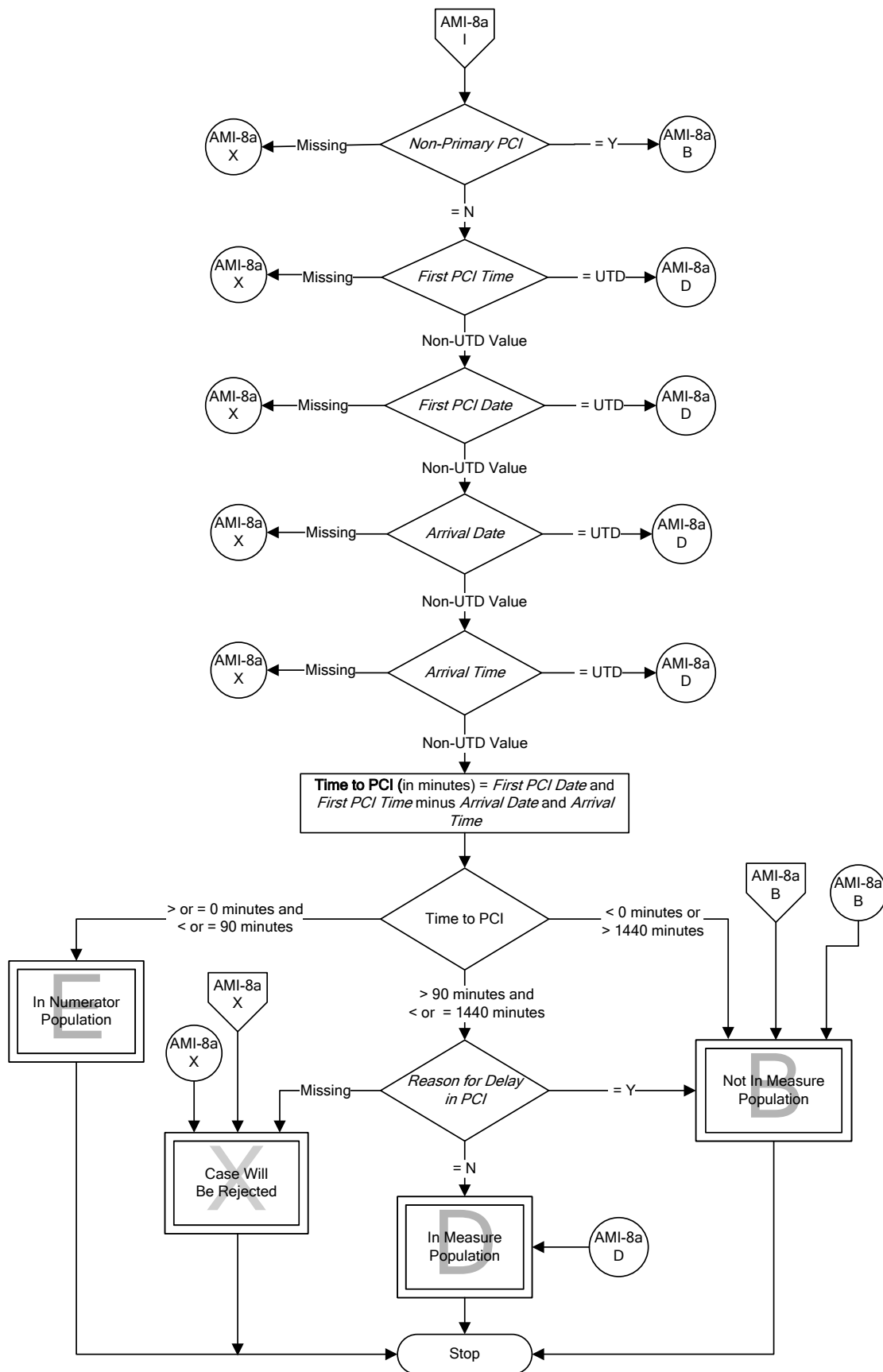
Numerator: AMI patients whose time from hospital arrival to primary PCI is 90 minutes or less.

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



Variable Key:
Time to Primary PCI





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 **Yes**, 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 **No**, 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.

Last Updated: Version 4.0

AMI-9 Inpatient Mortality was retired effective with January 1, 2011 discharges.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Acute Myocardial Infarction (AMI)

Set Measure ID #: AMI-10

Performance Measure Name: Statin Prescribed at Discharge

Description: Acute myocardial infarction (AMI) patients who are prescribed a statin at hospital discharge.

Rationale: Several randomized clinical trials have proven the benefits of statin drugs (also known as HMG Co-A reductase inhibitors) in reducing the risk of death and recurrent cardiovascular events in a broad range of patients with established cardiovascular disease, including those with prior myocardial infarction (4S, 1994; Sacks, 1996; LIPID Study Group, 1998; and MRC/BHF Heart Protection Study, 2002). Current ACC/AHA guidelines place a strong emphasis on the initiation or maintenance of statin drugs for patients hospitalized with AMI, particularly those with LDL-cholesterol levels above 100 mg/dL (Antman, 2004; Smith, 2006; Anderson, 2007; and Antman, 2008). As a result of the strength of the evidence and guideline support, the ACC/AHA have developed a performance measure to assess this aspect of care for patients with acute myocardial infarction (Krumholz, 2008). Because statins are generally well-tolerated, most patients with AMI are appropriate candidates for this therapy.

Type of Measure: Process

Improvement Noted As: An increase in rate

Numerator Statement: AMI patients who are prescribed a statin medication at hospital discharge.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

Statin Medication Prescribed at Discharge

Denominator Statement: AMI patients.

Included Populations:

- Discharges with an *ICD-9-CM Principal Diagnosis Code* for AMI as defined in Appendix A, Table 1.1

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with LDL less than 100 mg/dL within the first 24 hours after hospital arrival **or 30 days prior to hospital arrival** and not discharged on a statin
- Patients with a *Reason for Not Prescribing Statin Medication at Discharge*

Data Elements:

- *Admission Date*
- *Birthdate*
- *Clinical Trial*
- *Comfort Measures Only*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-9-CM Principal Diagnosis Code*
- *LDL-c Less Than 100 mg/dL*
- *Reason for Not Prescribing Statin Medication at Discharge*

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: None

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:

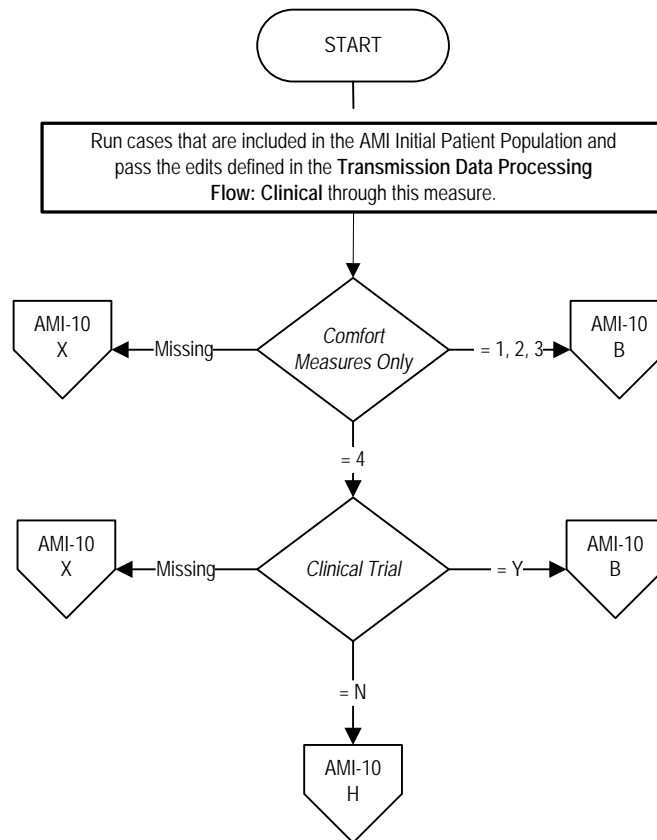
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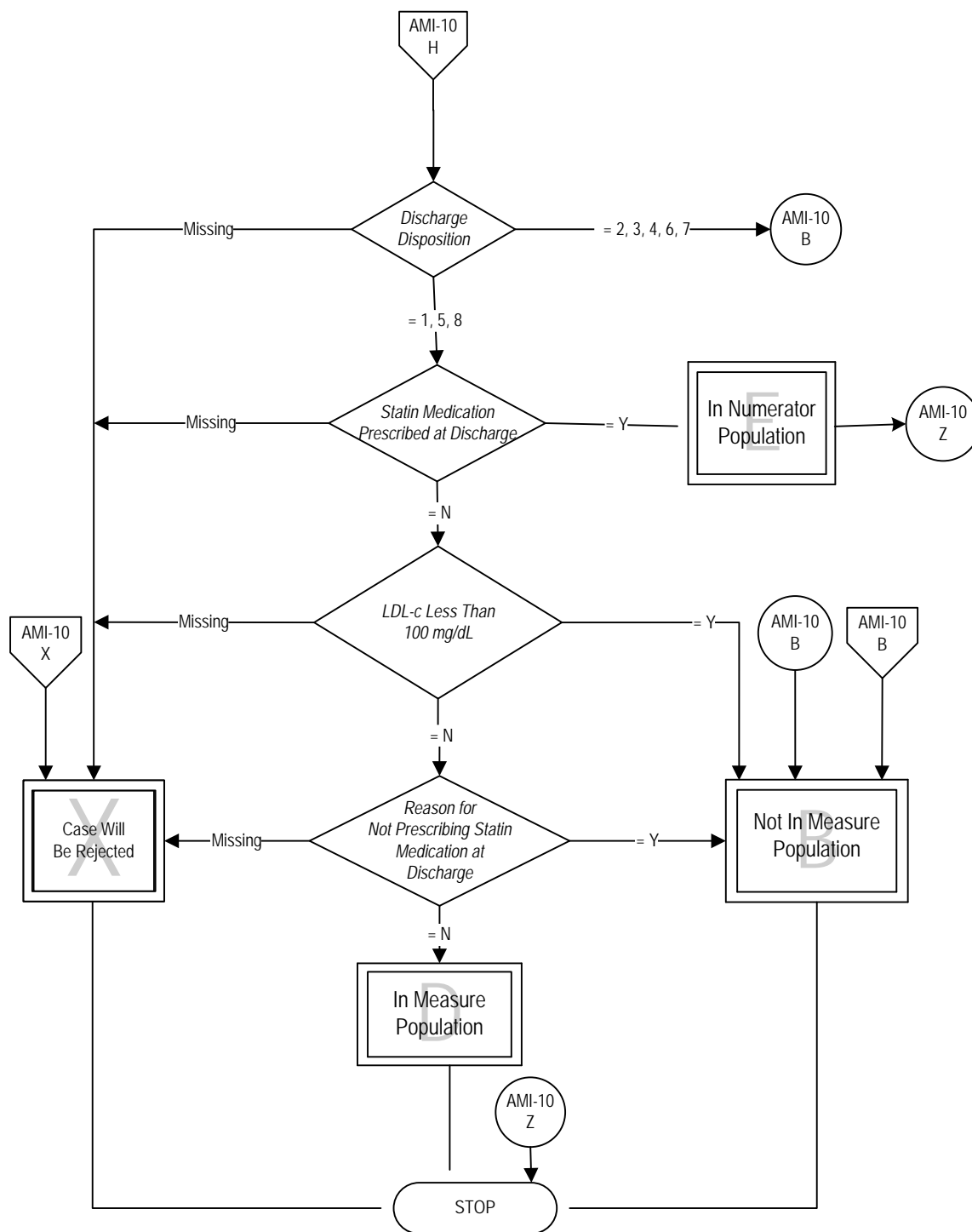
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AMI-10: Statin Prescribed at Discharge

Numerator: AMI patients who are prescribed a statin medication at hospital discharge.

Denominator: AMI patients.





Acute Myocardial Infarction (AMI)-10: Statin Prescribed at Discharge

Numerator: Acute Myocardial Infarction (AMI) patients who are prescribed a statin medication at hospital discharge.

Denominator: AMI patients.

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 Comfort Measures Only
 - a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Comfort Measures Only equals 1, 2, or 3 the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
 - c. If Comfort Measures Only equals 4, continue processing and proceed to Clinical Trial.
3. 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 Discharge Disposition.
4. Check Discharge Disposition
 - a. If Discharge Disposition is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Discharge Disposition is equal to 2, 3, 4, 6 or 7, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
 - c. If Discharge Disposition is equal to 1, 5 or 8, continue processing and proceed to Statin Medication Prescribed at Discharge.
5. Check Statin Medication Prescribed at Discharge
 - a. If Statin Medication Prescribed at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

- b. If Statin Medication Prescribed at Discharge equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
 - c. If Statin Prescribed at Discharge equals No, continue processing and proceed to LDL-c Less Than 100 mg/dL.
6. Check LDL-c Less Than 100 mg/dL
- a. If LDL-c Less Than 100 mg/dL is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If LDL-c Less Than 100 mg/dL 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 LDL-c Less Than 100 mg/dL equals No, continue processing and proceed to Reason for Not Prescribing Statin Medication at Discharge.
7. Check Reason for Not Prescribing Statin Medication at Discharge
- a. If Reason for Not Prescribing Statin Medication at Discharge is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
 - b. If Reason for Not Prescribing Statin Medication at Discharge 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 Reason for Not Prescribing Statin Medication at Discharge equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.