Measure Information Form

Measure Set: Venous Thromboembolism (VTE)

Set Measure Set ID #: VTE-6

Performance Measure Name: Hospital Acquired Potentially-Preventable Venous Thromboembolism

Description: This measure assesses the number of patients diagnosed with confirmed VTE during hospitalization (not present at admission) who did not receive VTE prophylaxis between hospital admission and the day before the VTE diagnostic testing order date.

Rationale: The concept of "failure to prevent" has generated interest in national health policy organizations to identify evidence-based practice that will improve patient safety in the hospital setting (Wachter et al 2008). The incidence of preventable venous thromboembolism (VTE) among hospitalized patients is overwhelming, and contributes to extended hospital stays, and the rising cost of health care. Zhan 2003, states that "VTE was the second most common medical complication of postoperative patients, the second most common cause of excess length of stay, and the third most common cause of excess mortality and excess charges". According to Arnold, D.M. (2001), preventable VTE is defined as "objectively diagnosed Deep Vein Thrombosis (DVT) or Pulmonary Emboli (PE) that occurred in a setting in which thromboprophylaxis was indicated but was either administered inadequately or not administered at all." In spite of formal guidelines, and recommendations for preventative care, pulmonary embolism is still the most common preventable cause of death among hospitalized patients (Wachter et al, 2008).

Type of Measure: Outcome

Improvement Noted As: A decrease in the rate

Numerator Statement: Patients who received no VTE prophylaxis prior to the VTE diagnostic test order date.

    Included Populations: Not Applicable

    Excluded Populations: None

    Data Elements:
    VTE Prophylaxis Status

Denominator Statement: Patients who developed confirmed VTE during hospitalization.

Included Populations:
Discharges with an *ICD-9-CM Other Diagnosis Codes* of VTE as defined in Appendix A, Table 7.03 or 7.04

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 with *ICD-9-CM Principal Diagnosis Code* of VTE as defined in Appendix A, Table 7.03 or 7.04
- Patients with *VTE Present at Admission*
- Patients with reasons for not administering mechanical and pharmacologic prophylaxis
- Patients without VTE confirmed by diagnostic testing

Data Elements:
- *Admission Date*
- *Birthdate*
- *Clinical Trial*
- *Comfort Measures Only*
- *Discharge Date*
- *ICD-9-CM Other Diagnosis Codes*
- *ICD-9-CM Principal Diagnosis Code*
- *Reason for No Administration of VTE Prophylaxis*
- *VTE Confirmed*
- *VTE Diagnostic Test*
- *VTE Present at Admission*

Risk Adjustment: No

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical record documents. Some hospitals may prefer to gather data concurrently by identifying patients in the population of interest. This approach provides opportunities for improvement at the point of care/service. However, complete documentation includes the principal or other ICD-9-CM diagnosis and procedure codes, which require retrospective data entry.

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: In order to identify areas for improvement, hospitals may want to stratify the numerator cases by patient age, diagnosis, or service designation. Patients that developed a VTE during hospitalization (denominator) that received prophylaxis could be evaluated in a separate analysis to determine if appropriate prophylaxis (modality, start time, duration) was administered.

Sampling: No, please refer to the measure set specific sampling requirements and for additional information see the Population and Sampling Specifications.

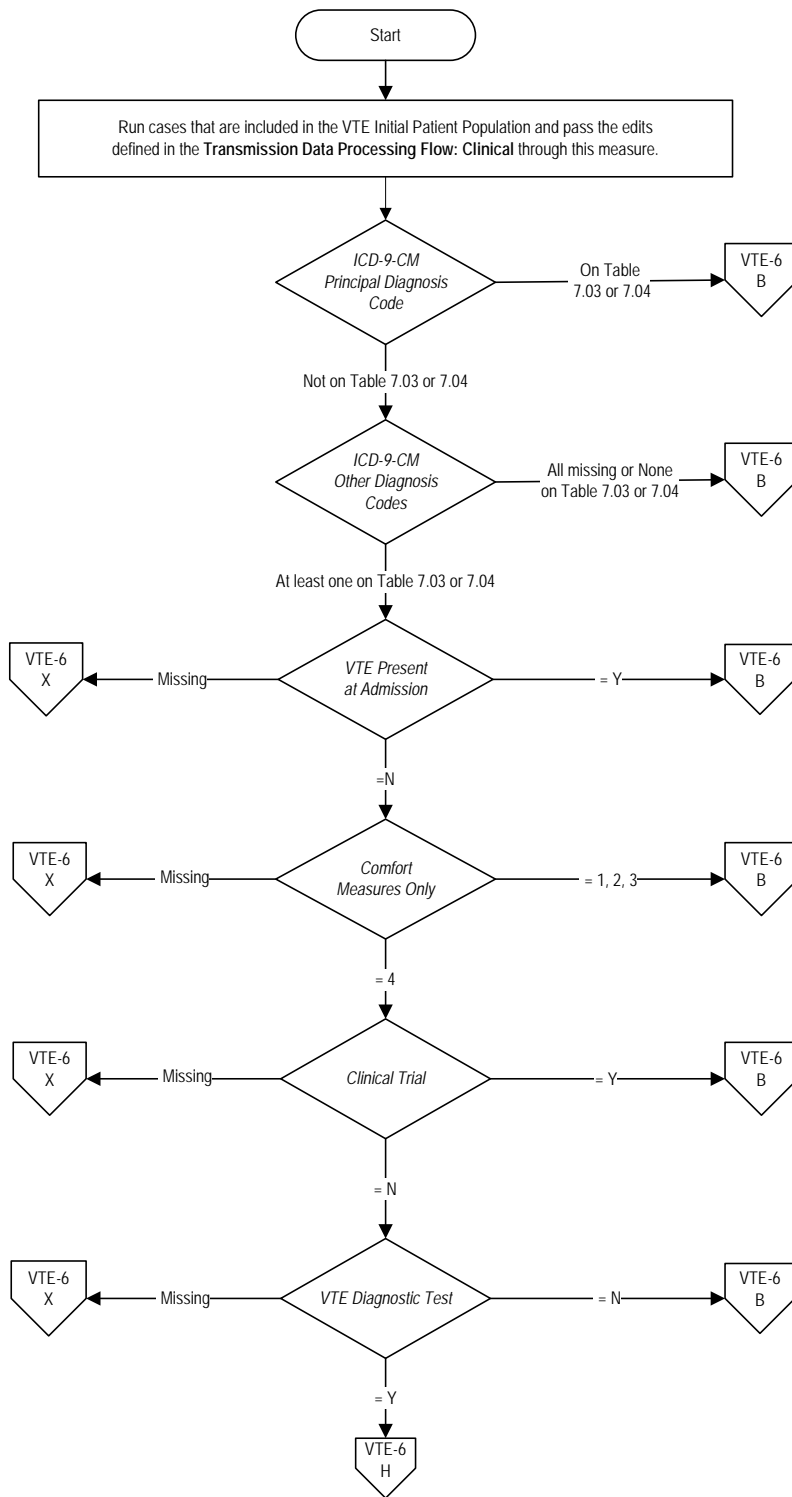**Data Reported as:** Aggregate rate generated from count data reported as a proportion.
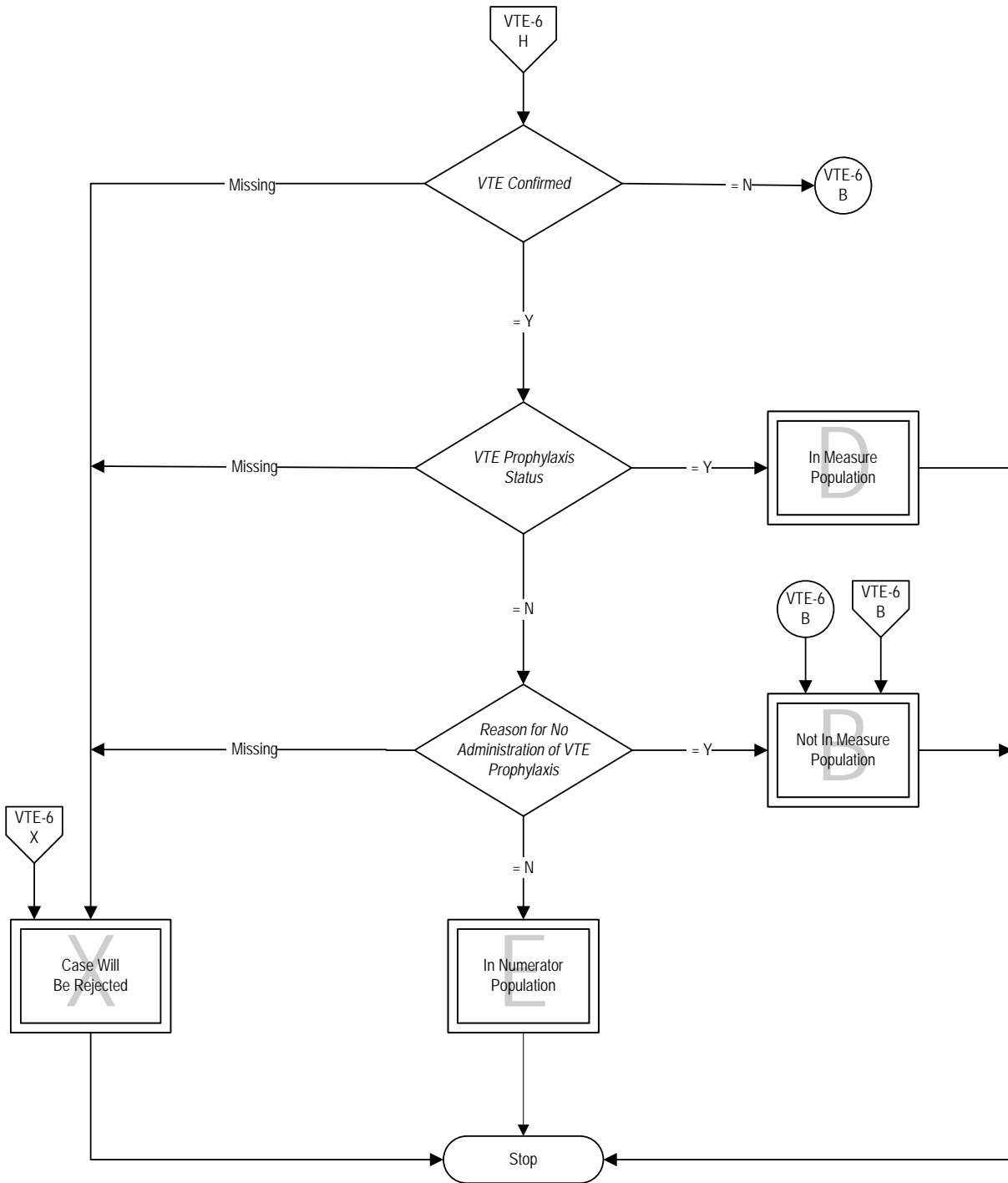
Selected References:
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VTE-6: Hospital Acquired Potentially-Preventable Venous Thromboembolism

Numerator: Patients who received no VTE prophylaxis prior to the VTE diagnostic test order date
Denominator: Patients who developed confirmed VTE during hospitalization

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                              ┌──────────────┐
                              │    Start     │
                              └──────┬───────┘
                                     │
         ┌───────────────────────────┴────────────────────────────┐
         │  Run cases that are included in the VTE Initial Patient  │
         │  Population and pass the edits defined in the            │
         │  Transmission Data Processing Flow: Clinical through     │
         │  this measure.                                           │
         └───────────────────────────┬────────────────────────────┘
                                     │
                              ◇ ICD-9-CM          On Table          VTE-6
                                Principal Diagnosis ────7.03 or 7.04──── B
                                Code ◇
                                     │
                            Not on Table 7.03 or 7.04
                                     │
                              ◇ ICD-9-CM          All missing or None   VTE-6
                                Other Diagnosis ──on Table 7.03 or 7.04── B
                                Codes ◇
                                     │
                         At least one on Table 7.03 or 7.04
                                     │
   VTE-6          Missing    ◇ VTE Present        = Y        VTE-6
     X      ◄────────────────  at Admission ◇ ──────────────  B
                                     │
                                    =N
                                     │
   VTE-6          Missing    ◇ Comfort           = 1, 2, 3   VTE-6
     X      ◄────────────────  Measures Only ◇ ─────────────  B
                                     │
                                    = 4
                                     │
   VTE-6          Missing    ◇ Clinical Trial ◇    = Y       VTE-6
     X      ◄────────────────                  ─────────────  B
                                     │
                                    = N
                                     │
   VTE-6          Missing    ◇ VTE Diagnostic Test ◇  = N    VTE-6
     X      ◄────────────────                  ─────────────  B
                                     │
                                    = Y
                                     │
                                  VTE-6
                                    H
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                            ┌─────────┐
                            │  VTE-6  │
                            │    H    │
                            └────┬────┘
                                 │
                                 ▼
      Missing               ╱ VTE Confirmed ╲           = N        ╱  VTE-6  ╲
  ◄──────────────────────── ╲               ╱ ─────────────────►  │    B    │
                                   │                               ╲         ╱
                                   │ = Y
                                   ▼
                            ╱ VTE Prophylaxis ╲    = Y      ┌─────────────────┐
      Missing              ╲     Status       ╱ ─────────► │   In Measure    │
  ◄──────────────────────── ╲               ╱             │   Population  D │
                                   │                        └─────────────────┘
                                   │ = N
                                   │                   ╱ VTE-6 ╲     ┌ VTE-6 ┐
                                   │                   │   B   │     │   B   │
                                   ▼                   ╲       ╱     └───┬───┘
                            ╱ Reason for No ╲     = Y       ┌─────────────────┐
      Missing              ╱ Administration of VTE ╲ ────► │  Not In Measure │
  ◄──────────────────────── ╲   Prophylaxis   ╱           │   Population  B │
                                   │                        └─────────────────┘
                                   │ = N
     ┌ VTE-6 ┐                     ▼
     │   X   │              ┌─────────────────┐
     └───┬───┘              │  In Numerator   │
         ▼                  │   Population  E │
  ┌─────────────┐           └────────┬────────┘
  │  Case Will  │                    │
  │ Be Rejected X│                   │
  └──────┬──────┘                    ▼
         │                     ╭──────────╮
         └────────────────────►│   Stop   │◄──────────────
                               ╰──────────╯
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VTE-6: Hospital Acquired Potentially-Preventable Venous Thromboembolism

Numerator: Patients who received no VTE prophylaxis prior to the VTE diagnostic test order date.

Denominator: Patients who developed confirmed VTE during hospitalization.

1. Start processing. Run cases that are included in the VTE Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Check ICD-9-CM Principal Diagnosis Code
   a. If the ICD-9-CM Principal Diagnosis Code is on Table 7.03 or 7.04, 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 Diagnosis Code is not on Table 7.03 or 7.04, continue processing and proceed to ICD-9-CM Other Diagnosis Codes.

3. Check ICD-9-CM Other Diagnosis Codes
   a. If all ICD-9-CM Other Diagnosis Codes are missing or none of them on Table 7.03 or 7.04, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If at least one of the ICD-9-CM Other Diagnosis Codes is on Table 7.03 or 7.04, continue processing and proceed to VTE Present at Admission.

4. Check VTE Present at Admission
   a. If VTE Present at Admission is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If VTE Present at Admission 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 VTE Present at Admission equals No, continue processing and proceed to Comfort Measures Only.

5. 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.

6. Check Clinical Trial

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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 VTE Diagnostic Test.

7.   Check VTE Diagnostic Test
a.   If VTE Diagnostic Test is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
b.   If VTE Diagnostic Test 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 VTE Diagnostic Test equals Yes, continue processing and proceed to VTE Confirmed.

8.   Check VTE Confirmed
a.   If VTE Confirmed is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
b.   If VTE Confirmed 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 VTE Confirmed equals Yes, continue processing and proceed to VTE Prophylaxis Status.

9.   Check VTE Prophylaxis Status
a.   If VTE Prophylaxis Status is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
b.   If VTE Prophylaxis Status equals Yes, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
c.   If VTE Prophylaxis Status equals No, continue processing and proceed to Reason for No Administration of VTE Prophylaxis.

10.   Check Reason for No Administration of VTE Prophylaxis
a.   If Reason for No Administration of VTE Prophylaxis is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
b.   If Reason for No Administration of VTE Prophylaxis 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 Administration of VTE Prophylaxis equals No, the case will proceed to a Measure Category Assignment of E and will be in Numerator Population. Stop processing.