SURGICAL CARE IMPROVEMENT PROJECT NATIONAL HOSPITAL INPATIENT QUALITY MEASURES

Set Measure ID # Infection	Measure Short Name
SCIP-Inf-1a	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Overall Rate
SCIP-Inf-1b	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - CABG
SCIP-Inf-1c	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Other Cardiac Surgery
SCIP-Inf-1d	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Hip Arthroplasty
SCIP-Inf-1e	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Knee Arthroplasty
SCIP-Inf-1f	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Colon Surgery
SCIP-Inf-1g	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Hysterectomy
SCIP-Inf-1h	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Vascular Surgery
SCIP-Inf-2a	Prophylactic Antibiotic Selection for Surgical Patients - Overall Rate
SCIP-Inf-2b	Prophylactic Antibiotic Selection for Surgical Patients - CABG
SCIP-Inf-2c	Prophylactic Antibiotic Selection for Surgical Patients - Other Cardiac Surgery
SCIP-Inf-2d	Prophylactic Antibiotic Selection for Surgical Patients - Hip Arthroplasty
SCIP-Inf-2e	Prophylactic Antibiotic Selection for Surgical Patients - Knee Arthroplasty
SCIP-Inf-2f	Prophylactic Antibiotic Selection for Surgical Patients - Colon Surgery
SCIP-Inf-2g	Prophylactic Antibiotic Selection for Surgical Patients - Hysterectomy
SCIP-Inf-2h	Prophylactic Antibiotic Selection for Surgical Patients - Vascular Surgery

Set Measure ID # Infection	Measure Short Name
SCIP-Inf-3a	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Overall Rate
SCIP-Inf-3b	Prophylactic Antibiotics Discontinued Within 48 Hours After Surgery End Time – CABG
SCIP-Inf-3c	Prophylactic Antibiotics Discontinued Within 48 Hours After Surgery End Time - Other Cardiac Surgery
SCIP-Inf-3d	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Hip Arthroplasty
SCIP-Inf-3e	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Knee Arthroplasty
SCIP-Inf-3f	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Colon Surgery
SCIP-Inf-3g	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time – Hysterectomy
SCIP-Inf-3h	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Vascular Surgery
SCIP-Inf-4	Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose
SCIP-Inf-6	Surgery Patients with Appropriate Hair Removal
SCIP-Inf-9	Urinary catheter removed on Postoperative Day 1 (POD 1) or Postoperative Day 2 (POD 2) with day of surgery being day zero
SCIP-Inf-10	Surgery Patients with Perioperative Temperature Management

Set Measure ID # Cardiac	Measure Short Name
SCIP-Card-2	Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

Set Measure ID # VTE	Measure Short Name
SCIP-VTE-1	Surgery Patients with Recommended Venous Thromboembolism Prophylaxis Ordered
SCIP-VTE-2	Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery

SCIP DATA ELEMENT LIST

General Data Element Name	Collected For:
Admission Date	All Records
Birthdate	All Records
Discharge Date	All Records (Used in Algorithm for SCIP-Inf-4)
First Name	All Records[1]
Hispanic Ethnicity	All Records[1]
Hospital Patient Identifier	All Records[1]
ICD-9-CM Other Diagnosis Codes	All Records
ICD-9-CM Other Procedure Codes	All Records
ICD-9-CM Other Procedure Dates	All Records
ICD-9-CM Principal Diagnosis Code	All Records
ICD-9-CM Principal Procedure Code	All Records (Used in Algorithm for all SCIP Measures)
ICD-9-CM Principal Procedure Date	All Records
Last Name	All Records[1]
Patient HIC #	All Records Collected by CMS for patients with a standard HIC#
Payment Source	All Records
Physician 1	Optional for All Records[1]
Physician 2	Optional for All Records[1]
Postal Code	All Records[1]
Race	All Records[1]
Sample	Used in transmission of the Joint Commission's aggregate data file and the Hospital Clinical Data file[2]
Sex	All Records

Algorithm Output Data Element Name	Collected For:
Measure Category Assignment	Used in the calculation of the Joint Commission's aggregate data and in the transmission of the Hospital Clinical Data file[2,3]

SCIP DATA ELEMENT LIST

SCIP Data Element Name	Collected For:
Anesthesia End Date	SCIP-Inf-2, SCIP-Inf-3, SCIP-Inf-4, SCIP-Inf-9, SCIP-Inf-10, SCIP-VTE-1, SCIP-VTE-2
Anesthesia End Time	SCIP-Inf-2, SCIP-Inf-3, SCIP-Inf-10, SCIP-VTE-1, SCIP-VTE-2
Anesthesia Start Date	ALL SCIP Measures
Anesthesia Start Time	SCIP-Inf-10, SCIP-VTE-1, SCIP-VTE-2
Anesthesia Type	SCIP-Inf-10, SCIP-VTE-1, SCIP-VTE-2
Antibiotic Administration Date	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Antibiotic Administration Route	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Antibiotic Administration Time	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Antibiotic Allergy	SCIP-Inf-2
Antibiotic Name	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Antibiotic Received	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Beta-Blocker Current Medication	SCIP-Card-2
Beta-Blocker During Pregnancy	SCIP-Card-2
Beta-Blocker Perioperative	SCIP-Card-2
Catheter Removed	SCIP-Inf-9
Clinical Trial	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3, SCIP-Inf-4, SCIP-Inf-6, SCIP-Inf-9, SCIP-Card-2, SCIP-VTE-1, SCIP-VTE-2
Glucose POD 1	SCIP-Inf-4
Glucose POD 2	SCIP-Inf-4
Infection Prior to Anesthesia	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3, SCIP-Inf-4
Intentional Hypothermia	SCIP-Inf-10
Laparoscope	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3, SCIP-Inf-4, SCIP-Inf-6, SCIP-Inf-9, SCIP-Card-2, SCIP-VTE-1, SCIP-VTE-2
Oral Antibiotics	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Other Surgeries	SCIP-Inf-1, SCIP-Inf-3, SCIP-Inf-9
Perioperative Death	SCIP-Inf-2, SCIP-Inf-3, SCIP-Inf-4, SCIP-Inf-9, SCIP-Card-2, SCIP-VTE-1, SCIP-VTE-2
Preadmission Warfarin	SCIP-VTE-1, SCIP-VTE-2
Preoperative Hair Removal	SCIP-Inf-6
Reason for Not Administering a Beta-Blocker- Perioperative	SCIP-Card-2
Reason for Not Administering VTE Prophylaxis	SCIP-VTE-1, SCIP-VTE-2
Reasons for Continuing Urinary Catheterization	SCIP-Inf-9

SCIP Data Element Name	Collected For:
Reasons to Extend Antibiotics	SCIP Inf-3
Surgical Incision Date	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Surgical Incision Time	SCIP-Inf-1, SCIP-Inf-2, SCIP-Inf-3
Temperature	SCIP-Inf-10
Urinary Catheter	SCIP-Inf-9
Vancomycin	SCIP-Inf-2
VTE Prophylaxis	SCIP-VTE-1, SCIP-VTE-2
VTE Timely	SCIP-VTE-2

[1] CMS ONLY
[2] Transmission Data Element
[3] The Joint Commission ONLY

Surgical Care Improvement Project (SCIP) Initial Patient Population

The SCIP Topic Population (common to all SCIP measures) is defined as patients admitted to the hospital for inpatient acute care with an *ICD-9-CM Principal Procedure Code* for SCIP as defined in Appendix A, Table 5.10 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days. There are eight distinct strata or sub-populations within the SCIP Topic Population, each identified by a specific group of procedure codes. The patients in each stratum are counted in the Initial Patient Population of multiple measures.

Measures	Initial Patient Population definition
SCIP-Inf-1a, 2a, 3a (overall measures)	The count of all patients in strata 1, 2, 3, 4, 5, 6, and 7
SCIP-Inf-1b, 2b, 3b	The count of all patients in stratum 1
SCIP-Inf-1c, 2c, 3c	The count of all patients in stratum 2
SCIP-Inf-1d, 2d, 3d	The count of all patients in stratum 3
SCIP-Inf-1e, 2e, 3e	The count of all patients in stratum 4
SCIP-Inf-1f, 2f, 3f	The count of all patients in stratum 5
SCIP-Inf-1g, 2g, 3g	The count of all patients in stratum 6
SCIP-Inf-1h, 2h, 3h	The count of all patients in stratum 7
SCIP-Inf-4, 6, 9, and 10	The count of all patients in strata 1, 2, 3, 4, 5, 6, 7, and 8
SCIP-CARD-2	The count of all patients in strata 1, 2, 3, 4, 5, 6, 7, and 8
SCIP-VTE-1 and 2	The count of all patients in strata 1, 2, 3, 4, 5, 6, 7, and 8

Patients admitted to the hospital for inpatient acute care are included in one of the SCIP ICD Strata Populations and are eligible to be sampled if they have:
1 – CABG stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.01 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

2 – Other Cardiac Surgery stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.02 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

3 – Hip Arthroplasty stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.04 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

4 – Knee Arthroplasty stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.05 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

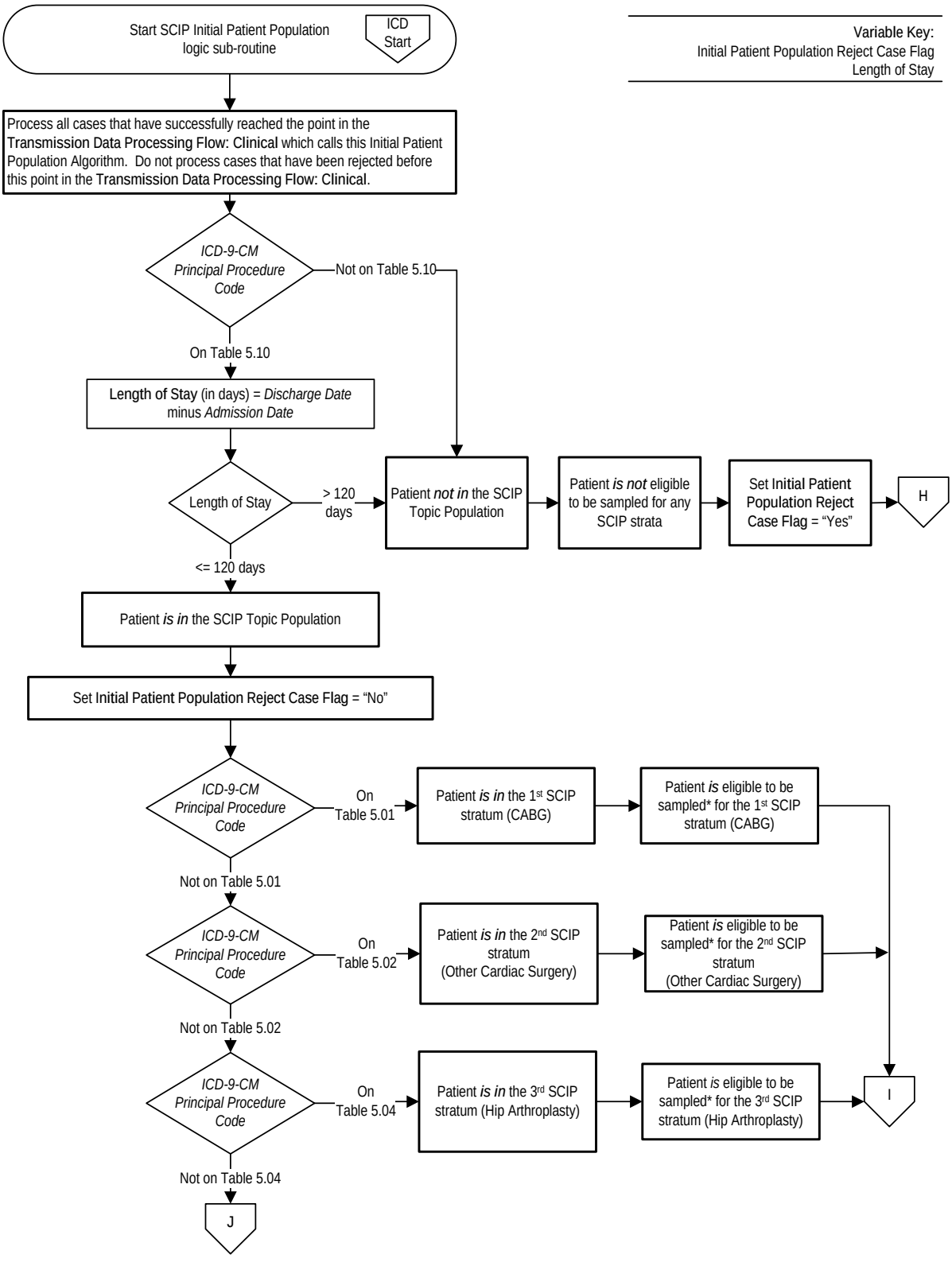
5 – Colon Surgery stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.03 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

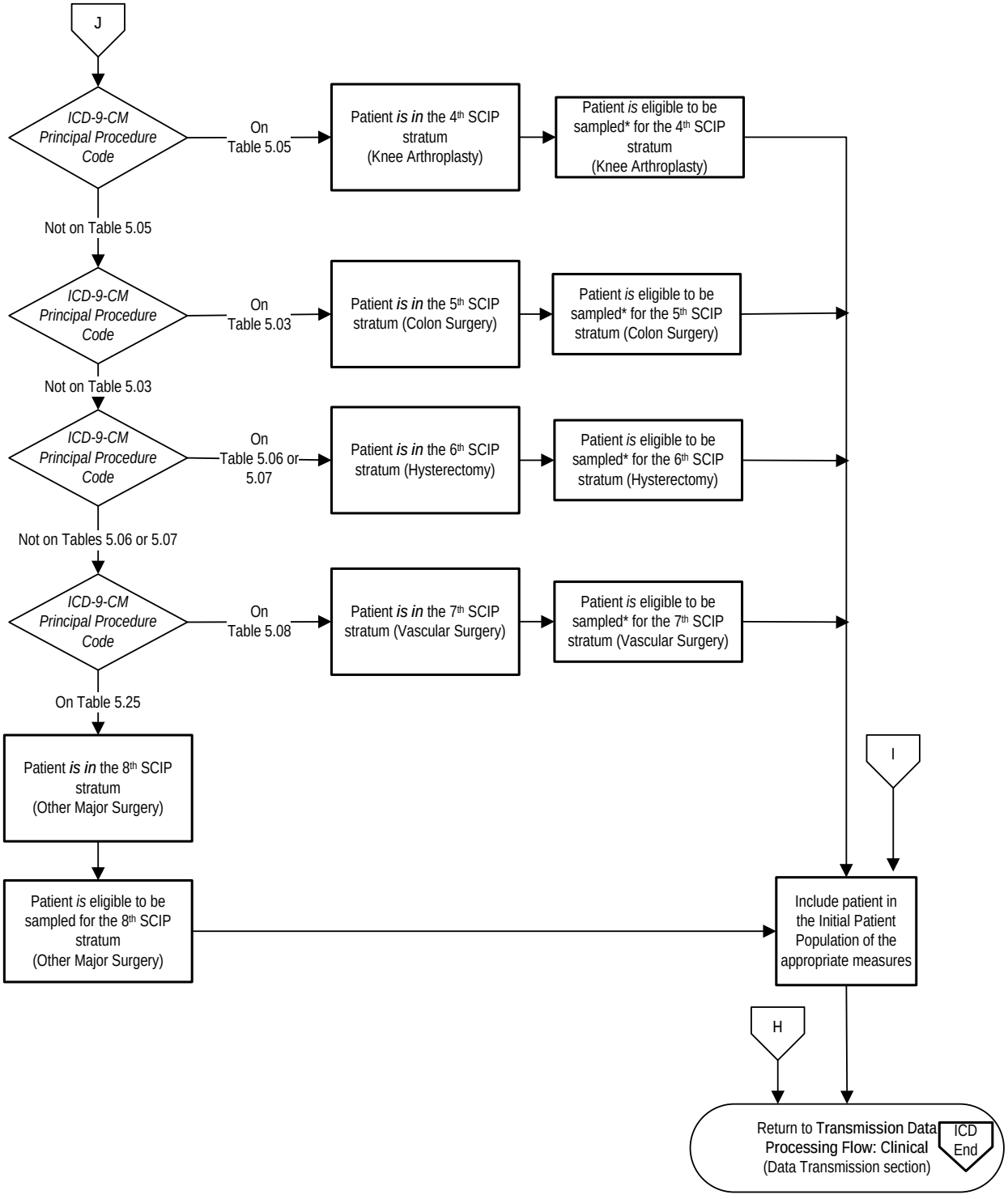
6 – Hysterectomy stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, on either Table 5.06 (Abdominal) or Table 5.07 (Vaginal) and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

7 – Vascular Surgery stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.08 and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

8 – Other Major Surgery stratum – Patients with an *ICD-9-CM Principal Procedure Code* as defined in Appendix A, Table 5.25 (Other Major Surgery for Sampling) and a Length of Stay (*Discharge Date* minus *Admission Date*) less than or equal to 120 days.

SCIP Initial Patient Population Algorithm




J
ICD-9-CM Principal Procedure Code
On Table 5.05
Patient is in the 4th SCIP stratum (Knee Arthroplasty)
Patient is eligible to be sampled* for the 4th SCIP stratum (Knee Arthroplasty)
Not on Table 5.05
ICD-9-CM Principal Procedure Code
On Table 5.03
Patient is in the 5th SCIP stratum (Colon Surgery)
Patient is eligible to be sampled* for the 5th SCIP stratum (Colon Surgery)
Not on Table 5.03
ICD-9-CM Principal Procedure Code
On Table 5.06 or 5.07
Patient is in the 6th SCIP stratum (Hysterectomy)
Patient is eligible to be sampled* for the 6th SCIP stratum (Hysterectomy)
Not on Tables 5.06 or 5.07
ICD-9-CM Principal Procedure Code
On Table 5.08
Patient is in the 7th SCIP stratum (Vascular Surgery)
Patient is eligible to be sampled* for the 7th SCIP stratum (Vascular Surgery)
On Table 5.25
Patient is in the 8th SCIP stratum (Other Major Surgery)
Patient is eligible to be sampled for the 8th SCIP stratum (Other Major Surgery)
I
Include patient in the Initial Patient Population of the appropriate measures
H
Return to Transmission Data Processing Flow: Clinical (Data Transmission section)
ICD End

Surgical Care Improvement Project (SCIP) Initial Patient Population Algorithm

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

1. Start SCIP 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 Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is not on Table 5.10, the patient is not in the SCIP Topic Population and is not eligible to be sampled for the SCIP strata. 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 Procedure Code is on Table 5.10, continue processing and proceed to the Length of Stay calculation.

3. Calculate the Length of Stay. Length of Stay, in days, is equal to the Discharge Date minus the Admission Date.

4. Check Length of Stay
   a. If the Length of Stay is greater than 120 days, the patient is not in the SCIP Topic Population and is not eligible to be sampled for any SCIP strata. 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 SCIP Topic Population. Continue processing.

5. Set the Initial Patient Population Reject Case Flag to equal No. Continue processing and proceed to the ICD-9-CM Principal Procedure Code to determine the SCIP strata.

6. Check ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is on Table 5.01, the patient is in the first SCIP or Coronary Artery Bypass Graft stratum and is eligible to be sampled for the first SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.02, the patient is in the second SCIP or Other Cardiac Surgery stratum and is eligible to be sampled for the second SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

c. If the ICD-9-CM Principal Procedure Code is on Table 5.04, the patient is in the third SCIP or Hip Arthroplasty stratum and is eligible to be sampled for the third SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

d. If the ICD-9-CM Principal Procedure Code is on Table 5.05, the patient is in the fourth SCIP or Knee Arthroplasty stratum and is eligible to be sampled for the fourth SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

e. If the ICD-9-CM Principal Procedure Code is on Table 5.03, the patient is in the fifth SCIP or Colon Surgery stratum and is eligible to be sampled for the fifth SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

f. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07, the patient is in the sixth SCIP or Hysterectomy stratum and is eligible to be sampled for the sixth SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

g. If the ICD-9-CM Principal Procedure Code is on Table 5.08, the patient is in the seventh SCIP or Vascular Surgery stratum and is eligible to be sampled for the seventh SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

h. If the ICD-9-CM Principal Procedure Code is on Table 5.25, the patient is in the eighth SCIP or Other Major Surgery stratum and is eligible to be sampled for the eighth SCIP stratum. Include the patient in the Initial Patient Population of the appropriate measures. Return to Transmission Data Processing Flow: Clinical in the Data Transmission section.

SCIP 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 a stratum cannot sample that stratum. Hospitals that have five or fewer SCIP discharges for the entire measure set (both Medicare and non-Medicare combined) in a quarter are not required to submit SCIP 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

For hospitals selecting sample cases for SCIP, a modified sampling procedure is required. Hospitals selecting sample cases for this set must ensure that each individual stratum's population and quarterly sample size meets the following conditions:

- *Select within each of the seven individual measure stratum (e.g., colorectal surgery, hip arthroplasty, etc.) and the 8th SCIP stratum (Table 5.25 in Appendix A).*

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

Hospital's Measure

Average Quarterly Stratum Initial Patient Population Size *"N"*	**Minimum Required Stratum Sample Size *"n"***
≥ 481	49
171-480	10% of Initial Patient Population size
17-170	17
< 17	No sampling; 100% Initial Patient Population required

Monthly Sampling

For hospitals selecting sample cases for SCIP, a modified sampling procedure is required. Hospitals selecting sample cases for this set must ensure that each individual strata population and monthly sample size meets the following conditions:

- *Select within each of the seven individual measure stratum (e.g., colorectal surgery, hip arthroplasty, etc.) and the 8th SCIP stratum (Table 5.25 in Appendix A).*

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

Hospital's Measure

Average Monthly Stratum Initial Patient Population Size *"N"*	**Minimum Required Stratum Sample Size *"n"***
≥ 151	16
61-150	10% of Initial Patient Population size
6-60	6
<6	No sampling; 100% Initial Patient Population required

Sample Size Examples

Note: All sampled strata in SCIP should be used in the calculation of all SCIP Infection, Venous Thromboembolism (VTE), and Cardiac measures, including the several surgery-specific measures (e.g., SCIP-Inf-4, Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose). All of the SCIP measures' specific exclusion criteria are used to filter out cases that do not belong in the measure denominator. Using SCIP-Inf-4 as an example, include cases covering all sampled strata, although the measure-specific exclusion criteria would only allow cases in the cardiac surgery stratum to be included in the denominator.

- Quarterly sampling:
  When applicable, larger hospitals must also abide by the required quarterly sample sizes for the seven individual measure stratums and the 8th SCIP stratum (Table 5.25 in Appendix A) a minimum of 17 required sample cases per strata when Initial Patient Population size is 17 or greater.

  - The SCIP Initial Patient Population sizes for a hospital are 5, 50, 16, 140, 35, 201, 3, and 481 patients respectively per stratum for the quarter. Since the total Initial Patient Population for SCIP is 931, the hospital must submit patient level data. The required quarterly sample sizes for each stratum would be 5, 17, 16, 17, 17, 21, 3, and 49.

        - The 1st, 3rd, and 7th strata are less than the minimum required quarterly sample size, so 100 % of each of these strata are sampled.
        - The 2nd, 4th, and 5th strata each require 17 cases to be sampled.
        - The 6th stratum has 201 patients per quarter, which requires a 10% sample size, or 21 cases (ten percent of 201 equals 20.1 rounded to the next highest whole number equal 21).
        - The 8th stratum is more than the maximum required quarterly sample size, so this stratum requires 49 cases to be sampled.

    - The SCIP Initial Patient Population sizes for a hospital are 1, 1, 0, 0, 1, 0, 1, and 1 patients respectively per stratum for the quarter. Since the total Initial Patient Population for SCIP is 5, the hospital may choose to not submit patient level data. If the hospital chooses to submit patient level data, the required quarterly sample sizes for each stratum would be 1, 1, 0, 0, 1, 0, 1, and 1.
        - The 1st, 2nd, 5th, 7th and 8th strata are less than the minimum required quarterly sample size, so 100% of each of these strata are sampled.
        - There is no data to sample for the 3rd, 4th, and 6th strata.

- Monthly sampling
  When applicable, larger hospitals must also abide by the required monthly sample sizes for the seven individual measure stratum and the 8th SCIP strata (Table 5.25 in Appendix A) a minimum of 6 required sample cases per strata when Initial Patient Population size is 6 or greater.

    - The SCIP Initial Patient Population sizes for a hospital are 5, 50, 15, 141, 35, 201, 3, and 481 patients respectively in June. The required monthly sample sizes would be 5, 6, 6, 15, 6, 16, 3, and 16.
        - The 1st and 7th strata are less than the minimum required monthly sample size, so 100% of each of these strata are sampled.
        - The 2nd, 3rd, and 5th strata each require 6 cases to be sampled.
        - The 4th stratum has 141 patients per month, which requires a 10% sample size, or 15 cases (ten percent of 141 equals 14.1 rounded to the next highest whole number equals 15).
        - The 6th and 8th strata are each more than the maximum required monthly sample size, so each of these strata requires 16 cases to be sampled.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-Inf-1

Set Measure ID #	Performance Measure Name
SCIP-Inf-1a	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Overall Rate
SCIP-Inf-1b	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - CABG
SCIP-Inf- 1c	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Other Cardiac Surgery
SCIP-Inf-1d	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Hip Arthroplasty
SCIP-Inf-1e	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Knee Arthroplasty
SCIP-Inf-1f	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Colon Surgery
SCIP-Inf-1g	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Hysterectomy
SCIP-Inf-1h	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision - Vascular Surgery

Performance Measure Name: Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision

Description: Surgical patients with prophylactic antibiotics initiated within one hour prior to surgical incision. Patients who received vancomycin or a fluoroquinolone for prophylactic antibiotics should have the antibiotics initiated within two hours prior to surgical incision. Due to the longer infusion time required for vancomycin or a fluoroquinolone, it is acceptable to start these antibiotics within two hours prior to incision time.

Rationale: A goal of prophylaxis with antibiotics is to establish bactericidal tissue and serum levels at the time of skin incision. Studies performed in the 1960's and 1970's demonstrated that a common reason for failure of prophylaxis was delay of antibiotic administration until after the operation. In a study of 2,847 surgery patients at LDS Hospital in Salt Lake City, it was found that the lowest incidence of post-operative infection was associated with antibiotic administration during the one hour prior to

surgery. The risk of infection increased progressively with greater time intervals between administration and skin incision. This relationship was observed whether antibiotics preceded or followed skin incision (Classen 1993).

Opportunities to improve care have been demonstrated and timely administration has been recommended. For example, at LDS Hospital, administration of the first antibiotic dose “on call” to the operating room was frequently associated with timing errors. Altering the system there resulted in an increase in appropriate timing from 40% of cases in 1985 to 99% of cases in 1998.

Type of Measure: Process

Improvement Noted As: An increase in the rate.

Numerator Statement: Number of surgical patients with prophylactic antibiotics initiated within one hour prior to surgical incision (two hours if receiving vancomycin, in Appendix C, Table 3.8, or a fluoroquinolone, in Appendix C, Table 3.10).

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:
- *Anesthesia Start Date*
- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Surgical Incision Date*
- *Surgical Incision Time*

Denominator Statement: All selected surgical patients with no evidence of prior infection.

Included Populations:
- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

AND

- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.01-5.08 for ICD-9-CM codes).

Excluded Populations:
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients who had a hysterectomy and a caesarean section performed during this hospitalization
- Patients who had a principal diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 5.09 for ICD-9-CM

codes)
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients who had other procedures requiring general or spinal anesthesia that occurred within 3 days (4 days for CABG or Other Cardiac Surgery) prior to or after the procedure of interest (during separate surgical episodes) during this hospital stay
- Patients who were receiving antibiotics more than 24 hours prior to surgery
- Patients who were receiving antibiotics within 24 hours prior to arrival (except colon surgery patients taking oral prophylactic antibiotics)

Data Elements:
- *Anesthesia Start Date*
- *Admission Date*
- *Antibiotic Administration Route*
- *Antibiotic Name*
- *Antibiotic Received*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Infection Prior to Anesthesia*
- *Laparoscope*
- *Oral Antibiotics*
- *Other Surgeries*

Risk Adjustment: No

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

Data Accuracy: Abstracted antibiotics are those administered from the time of arrival through the first 48 hours (72 hours for CABG or Other Cardiac Surgery) after the *Anesthesia End Time.* Refer to Appendix C, Table 2.1 which contains a complete listing of antibiotics.

Measure Analysis Suggestions: Consideration may be given to relating this measure to SCIP-Inf-2 and to SCIP-Inf-3 in order to evaluate which aspects of antibiotic prophylaxis (i.e., timing, selection) would most benefit from an improvement effort. The process-owners for timing of administration of antibiotics, as assessed in this measure, may include clinicians and support staff on the nursing unit as well as in the presurgical holding area, as well as in the operating room itself. Opportunities may exist in any of these arenas which, when addressed jointly, can generate true process improvement.

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: Overall aggregate rate for all surgeries and stratified rates by data element *ICD-9-CM Principal Procedure Code*, generated from count data reported as a proportion.

Selected References:

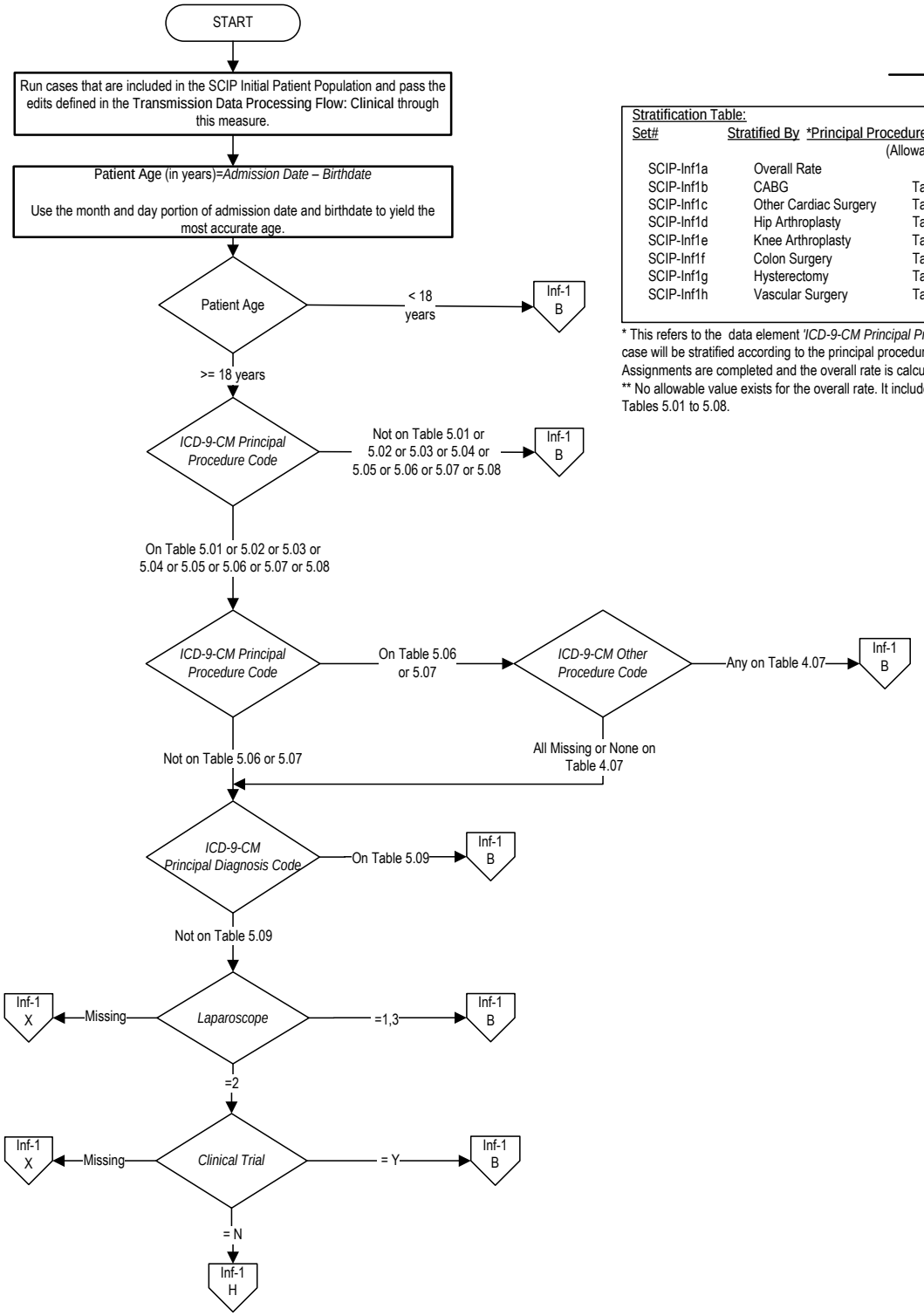
- Bratzler DW, Houck PM, for the Surgical Infection Prevention Guidelines Writers Group. Antimicrobial prophylaxis for surgery: An advisory statement from the National Surgical Infection Prevention Project. *CID*. 2004:38(15 June):1706-1715.
- Mangram AJ, Horan TC, Pearson ML, et al. Guidelines for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol.* 1999;20:247-280.
- Silver A, Eichorn A, Kral J, et al. Timeliness and use of antibiotic prophylaxis in selected inpatient surgical procedures. *Am J Surg.* 1996;171:548-552.
- Larsen RA, Evans RS, Burke JP, et al. Improved perioperative antibiotic use and reduced surgical wound infections through use of computer decision analysis. *Infect Control Hosp Epidemiol.* 1989;10:316-320.
- Finkelstein R, Reinhertz G, Embom A. Surveillance of the use of antibiotic prophylaxis in surgery. *Isr J Med Sci.* 1996;32:1093-1097.
- Matuschka PR, Cheadle WG, Burke JD, et al. A new standard of care: administration of preoperative antibiotics in the operating room. *Am Surg.* 1997;63:500-503.
- Gorecki P, Schein M, Rucinski JC, et al. Antibiotic administration in patients undergoing common surgical procedures in a community teaching hospital: the chaos continues. *World J Surg.* 1999;23:429-432.
- Bernard HR, Cole WR. The prophylaxis of surgical infections: the effect of prophylactic antimicrobial drugs on the incidence of infection following potentially contaminated operations. *Surgery.* 1964;56:151-157.
- Polk HC, Lopez-Mayor JF. Postoperative wound infection: a prospective study of determinant factors and prevention. *Surgery.* 1969;66:97-103.
- Stone HH, Hooper CA, Kolb LD, et al. Antibiotic prophylaxis in gastric, biliary, and colonic surgery. *Ann Surg.* 1976;184:443-452.
- American College of Obstetricians and Gynecologists (ACOG) Committee on Practice Bulletins ACOG Practice Bulletin No 104 Antibiotic prophylaxis for gynecologic procedures. *Obstet Gynecol* May 2009; 113(5) : 1180-1189.

SCIP-Inf-1: Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision

Numerator: Number of surgical patients with prophylactic antibiotics initiated within one hour prior to surgical incision (two hours if receiving vancomycin or fluoroquinolone).

Denominator: All selected surgical patients with no evidence of prior infection.

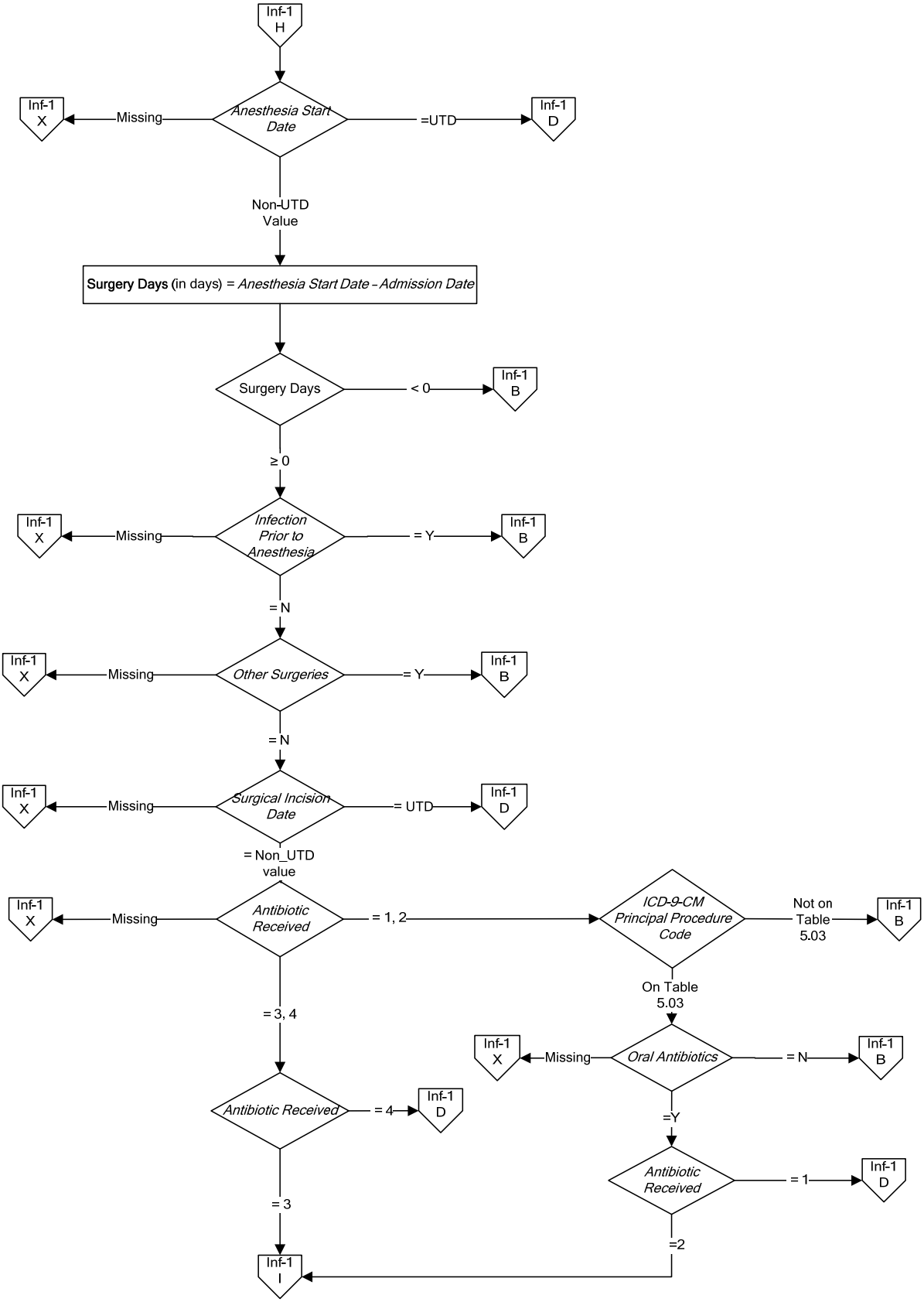
Variable Key:
Patient Age
Antibiotic Days I
Antibiotic Timing I
Surgery Days

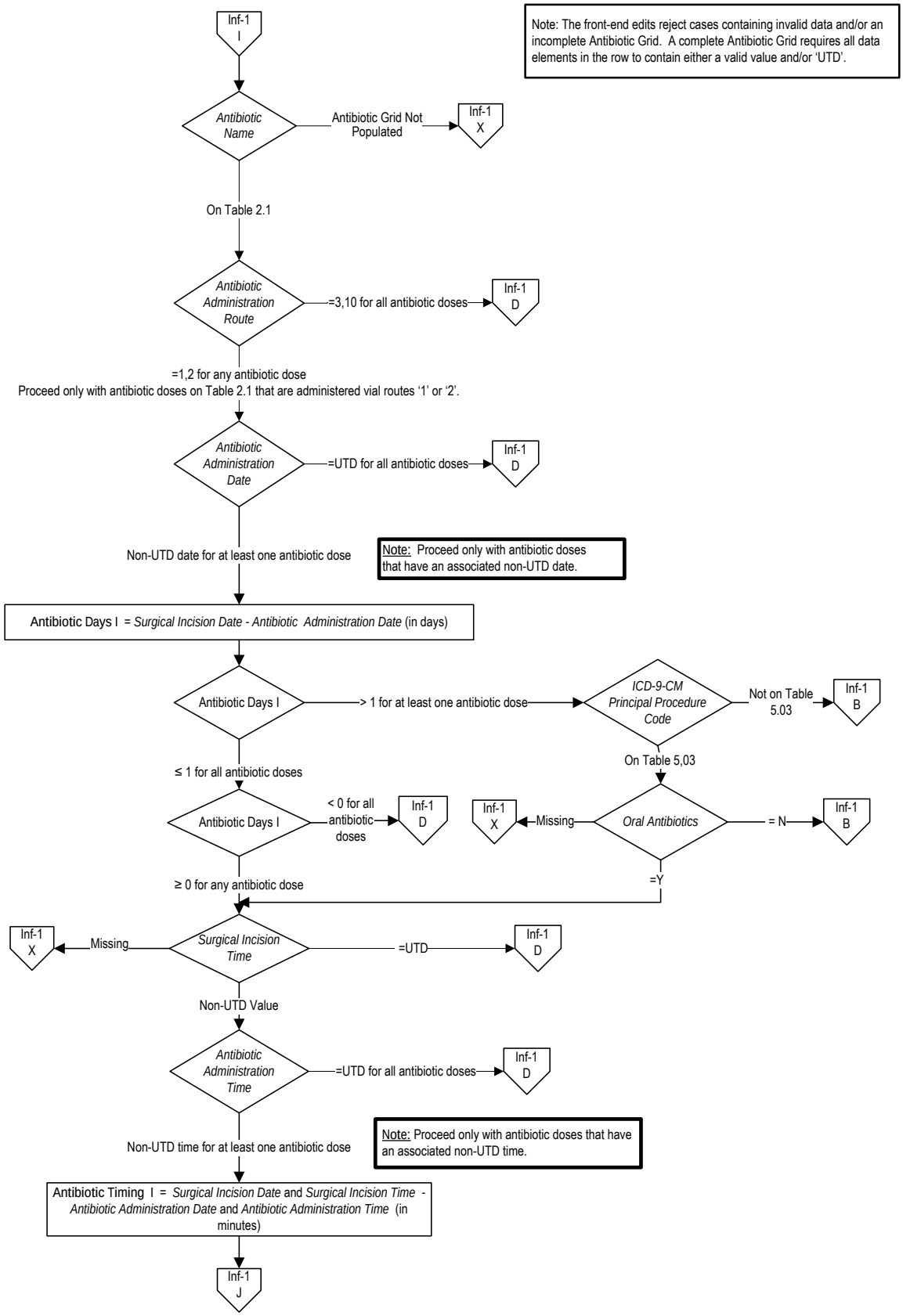


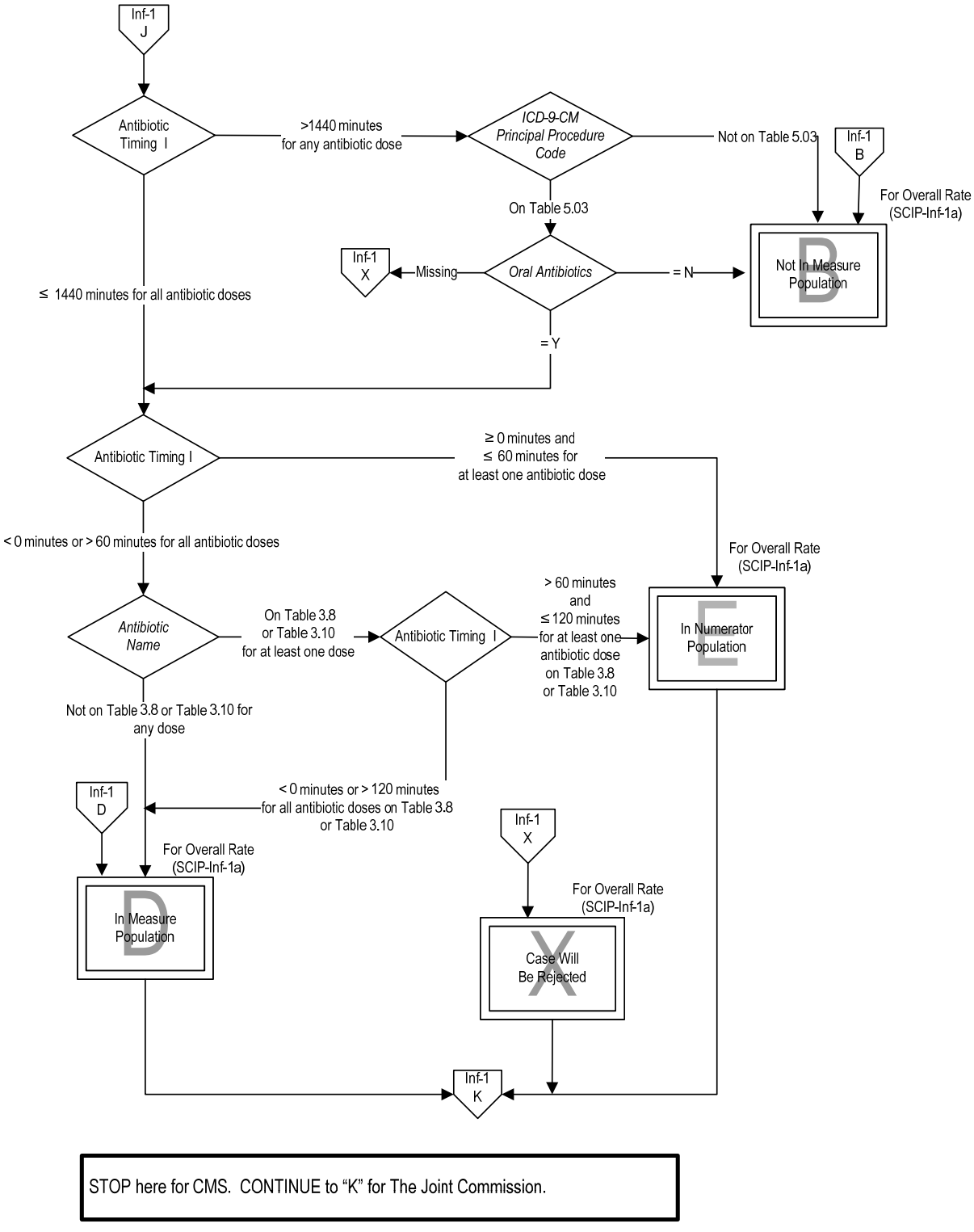
Stratification Table:

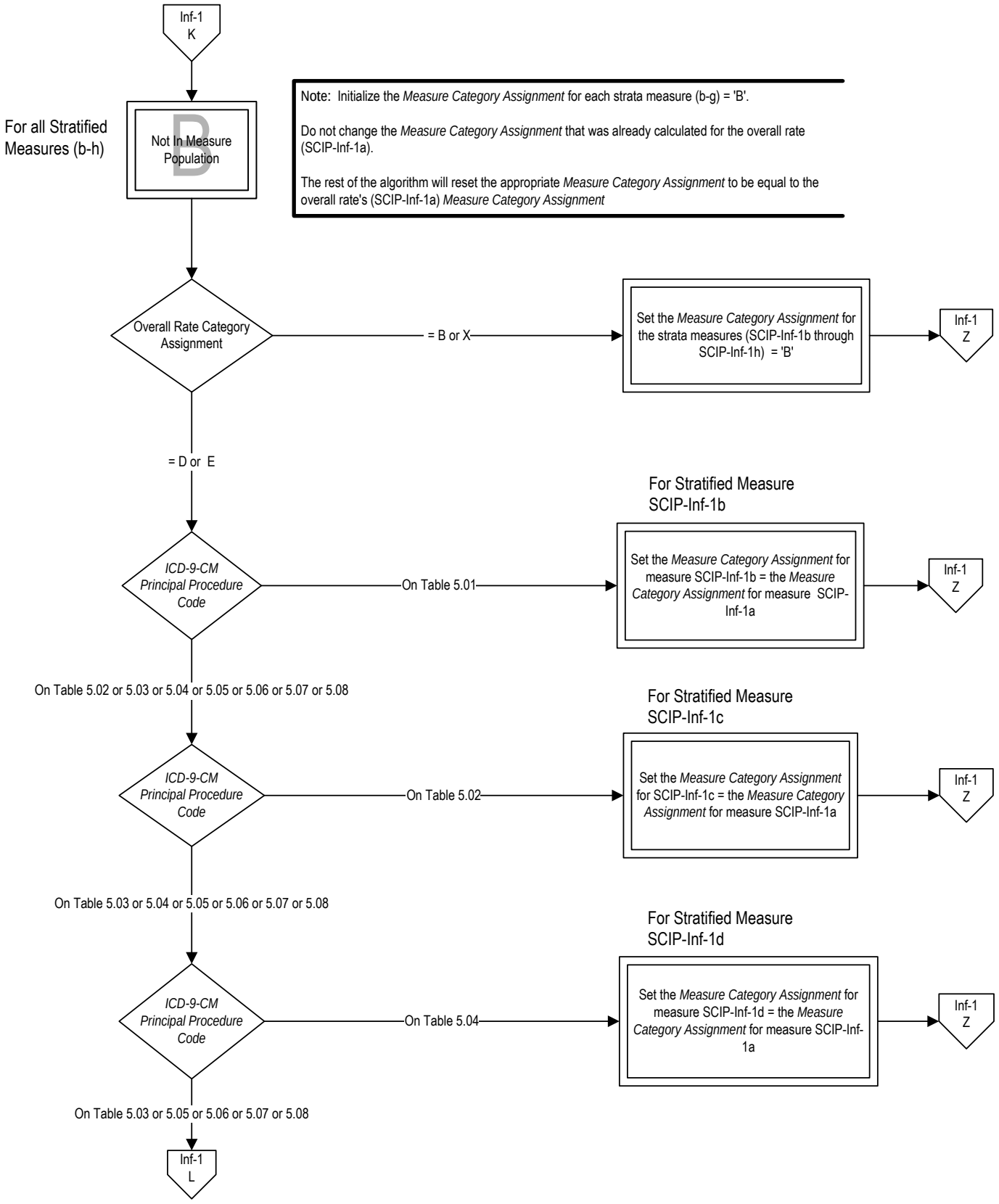
Set#	Stratified By	*Principal Procedure Code (Allowable Value)
SCIP-Inf1a	Overall Rate	**
SCIP-Inf1b	CABG	Table 5.01
SCIP-Inf1c	Other Cardiac Surgery	Table 5.02
SCIP-Inf1d	Hip Arthroplasty	Table 5.04
SCIP-Inf1e	Knee Arthroplasty	Table 5.05
SCIP-Inf1f	Colon Surgery	Table 5.03
SCIP-Inf1g	Hysterectomy	Table 5.06 Or 5.07
SCIP-Inf1h	Vascular Surgery	Table 5.08

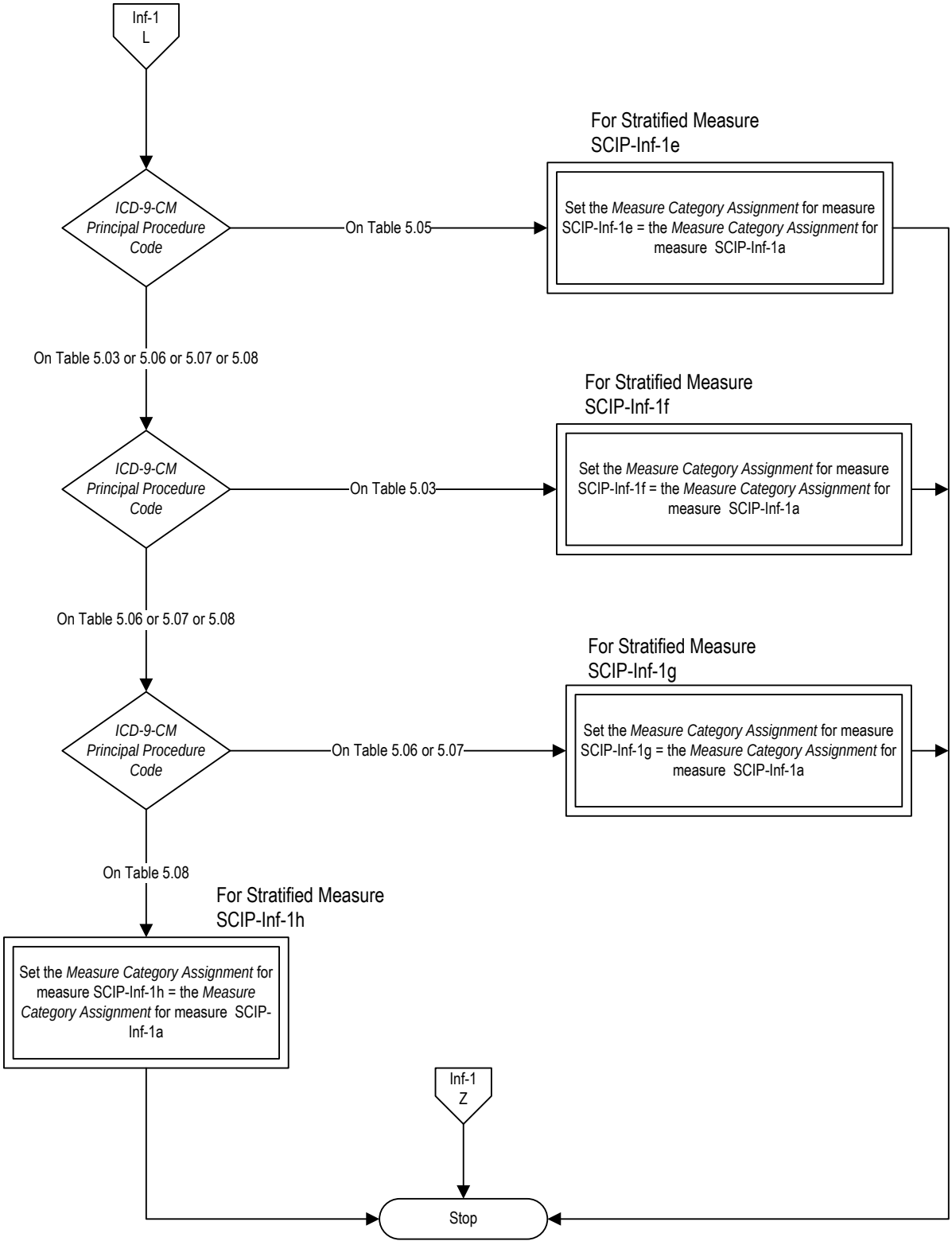
* This refers to the data element *'ICD-9-CM Principal Procedure Code'*. Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.
** No allowable value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.


Inf-1 H
Anesthesia Start Date
Missing
Inf-1 X
=UTD
Inf-1 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
Inf-1 B
≥ 0
Infection Prior to Anesthesia
Missing
Inf-1 X
= Y
Inf-1 B
= N
Other Surgeries
Missing
Inf-1 X
= Y
Inf-1 B
= N
Surgical Incision Date
Missing
Inf-1 X
= UTD
Inf-1 D
= Non_UTD value
Antibiotic Received
Missing
Inf-1 X
= 1, 2
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-1 B
On Table 5.03
= 3, 4
Antibiotic Received
= 4
Inf-1 D
= 3
Oral Antibiotics
Missing
Inf-1 X
= N
Inf-1 B
=Y
Antibiotic Received
= 1
Inf-1 D
=2
Inf-1 I


Inf-1 I
Note: The front-end edits reject cases containing invalid data and/or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or 'UTD'.
Antibiotic Name
Antibiotic Grid Not Populated
Inf-1 X
On Table 2.1
Antibiotic Administration Route
=3,10 for all antibiotic doses
Inf-1 D
=1,2 for any antibiotic dose
Proceed only with antibiotic doses on Table 2.1 that are administered vial routes '1' or '2'.
Antibiotic Administration Date
=UTD for all antibiotic doses
Inf-1 D
Non-UTD date for at least one antibiotic dose
Note: Proceed only with antibiotic doses that have an associated non-UTD date.
Antibiotic Days I = Surgical Incision Date - Antibiotic Administration Date (in days)
Antibiotic Days I
> 1 for at least one antibiotic dose
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-1 B
On Table 5,03
≤ 1 for all antibiotic doses
Antibiotic Days I
< 0 for all antibiotic doses
Inf-1 D
Inf-1 X
Missing
Oral Antibiotics
= N
Inf-1 B
=Y
≥ 0 for any antibiotic dose
Inf-1 X
Missing
Surgical Incision Time
=UTD
Inf-1 D
Non-UTD Value
Antibiotic Administration Time
=UTD for all antibiotic doses
Inf-1 D
Non-UTD time for at least one antibiotic dose
Note: Proceed only with antibiotic doses that have an associated non-UTD time.
Antibiotic Timing I = Surgical Incision Date and Surgical Incision Time - Antibiotic Administration Date and Antibiotic Administration Time (in minutes)
Inf-1 J


Inf-1 J
Antibiotic Timing I
>1440 minutes for any antibiotic dose
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-1 B
For Overall Rate (SCIP-Inf-1a)
On Table 5.03
Inf-1 X
Missing
Oral Antibiotics
= N
Not In Measure Population
D
≤ 1440 minutes for all antibiotic doses
= Y
Antibiotic Timing I
≥ 0 minutes and ≤ 60 minutes for at least one antibiotic dose
< 0 minutes or > 60 minutes for all antibiotic doses
For Overall Rate (SCIP-Inf-1a)
Antibiotic Name
On Table 3.8 or Table 3.10 for at least one dose
Antibiotic Timing I
> 60 minutes and ≤ 120 minutes for at least one antibiotic dose on Table 3.8 or Table 3.10
In Numerator Population
E
Not on Table 3.8 or Table 3.10 for any dose
< 0 minutes or > 120 minutes for all antibiotic doses on Table 3.8 or Table 3.10
Inf-1 D
For Overall Rate (SCIP-Inf-1a)
In Measure Population
D
Inf-1 X
For Overall Rate (SCIP-Inf-1a)
Case Will Be Rejected
X
Inf-1 K
STOP here for CMS. CONTINUE to "K" for The Joint Commission.


Inf-1 K
For all Stratified Measures (b-h)
B
Not In Measure Population
Note: Initialize the Measure Category Assignment for each strata measure (b-g) = 'B'.
Do not change the Measure Category Assignment that was already calculated for the overall rate (SCIP-Inf-1a).
The rest of the algorithm will reset the appropriate Measure Category Assignment to be equal to the overall rate's (SCIP-Inf-1a) Measure Category Assignment
Overall Rate Category Assignment
= B or X
Set the Measure Category Assignment for the strata measures (SCIP-Inf-1b through SCIP-Inf-1h) = 'B'
Inf-1 Z
= D or E
For Stratified Measure SCIP-Inf-1b
ICD-9-CM Principal Procedure Code
On Table 5.01
Set the Measure Category Assignment for measure SCIP-Inf-1b = the Measure Category Assignment for measure SCIP-Inf-1a
Inf-1 Z
On Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
For Stratified Measure SCIP-Inf-1c
ICD-9-CM Principal Procedure Code
On Table 5.02
Set the Measure Category Assignment for SCIP-Inf-1c = the Measure Category Assignment for measure SCIP-Inf-1a
Inf-1 Z
On Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
For Stratified Measure SCIP-Inf-1d
ICD-9-CM Principal Procedure Code
On Table 5.04
Set the Measure Category Assignment for measure SCIP-Inf-1d = the Measure Category Assignment for measure SCIP-Inf-1a
Inf-1 Z
On Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08
Inf-1 L


Inf-1
L
ICD-9-CM
Principal Procedure
Code
On Table 5.05
For Stratified Measure
SCIP-Inf-1e
Set the Measure Category Assignment for measure SCIP-Inf-1e = the Measure Category Assignment for measure SCIP-Inf-1a
On Table 5.03 or 5.06 or 5.07 or 5.08
ICD-9-CM
Principal Procedure
Code
On Table 5.03
For Stratified Measure
SCIP-Inf-1f
Set the Measure Category Assignment for measure SCIP-Inf-1f = the Measure Category Assignment for measure SCIP-Inf-1a
On Table 5.06 or 5.07 or 5.08
ICD-9-CM
Principal Procedure
Code
On Table 5.06 or 5.07
For Stratified Measure
SCIP-Inf-1g
Set the Measure Category Assignment for measure SCIP-Inf-1g = the Measure Category Assignment for measure SCIP-Inf-1a
On Table 5.08
For Stratified Measure
SCIP-Inf-1h
Set the Measure Category Assignment for measure SCIP-Inf-1h = the Measure Category Assignment for measure SCIP-Inf-1a
Inf-1
Z
Stop

SCIP-Infection (Inf)-1: Prophylactic Antibiotics Received Within One Hour Prior to Surgical Incision

Numerator: Number of surgical patients with prophylactic antibiotics initiated within one hour prior to surgical incision (two hours if receiving vancomycin or fluoroquinolone).

Denominator: All selected surgical patients with no evidence of prior infection.

Variable Key: Patient Age, Antibiotic Days I, Antibiotic Timing I, Surgery Days

Stratification Table

The Stratification Table includes the Set Number, Stratified By, and the Principal Procedure Code (Allowable Value). The Principal Procedure Code refers to the data element ICD-9-CM Principal Procedure Code. Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.

Set Number	Stratified By the Overall Rate	Principal Procedure Code
SCIP-Inf 1a	Overall Rate	No allowable Value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.
SCIP-Inf 1b	Coronary Artery Bypass Graft (CABG)	Table 5.01
SCIP-Inf 1c	Other Cardiac Surgery	Table 5.02
SCIP-Inf 1d	Hip Arthroplasty	Table 5.04
SCIP-Inf 1e	Knee Arthroplasty	Table 5.05
SCIP-Inf 1f	Colon Surgery	Table 5.03
SCIP-Inf 1g	Hysterectomy	Table 5.06 or Table 5.07
SCIP-Inf 1h	Vascular Surgery	Table 5.08

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If the Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for Centers for Medicare and Medicaid Services (CMS). Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.

b. If the Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is not on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   b. If the ICD-9-CM Principal Procedure Code is on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code.

5. Recheck ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07, continue processing and check ICD-9-CM Other Procedure Code.
      1. If any of the ICD-9-CM Other Procedure Codes are on Table 4.07, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
      2. If all of the ICD-9-CM Other Procedure Codes are missing or none are on Table 4.07, continue processing and proceed to ICD-9-CM Principal Diagnosis Code.
   b. If the ICD-9-CM Principal Procedure Code is not on Table 5.06 or 5.07, continue processing and proceed to ICD-9-CM Principal Diagnosis Code.

6. Check ICD-9-CM Principal Diagnosis Code
   a. If the ICD-9-CM Principal Diagnosis Code is on Table 5.09, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   b. If the ICD-9-CM Principal Diagnosis Code is not on Table 5.09, continue processing and proceed to Laparoscope.

7. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.

b. If Laparoscope equals 1 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
c. If Laparoscope equals 2, continue processing and proceed to Clinical Trial.

8. 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 for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   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 for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   c. If Clinical Trial equals No, continue processing and proceed to Anesthesia Start Date.

9. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   b. If the Anesthesia Start 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 for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   c. If Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

10. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

11. Check Surgery Days
   a. If the Surgery Days is less than zero, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
   b. If the Surgery Days is greater than or equal to zero, continue processing and proceed to Infection Prior to Anesthesia.

12. Check Infection Prior to Anesthesia
    a. If Infection Prior to Anesthesia is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If Infection Prior to Anesthesia equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    c. If Infection Prior to Anesthesia equals No, continue processing and proceed to Other Surgeries.

13. Check Other Surgeries
    a. If Other Surgeries is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If Other Surgeries equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    c. If Other Surgeries equals No, continue processing and proceed to Surgical Incision Date.

14. Check Surgical Incision Date
    a. If the Surgical Incision Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP- Inf-1a) for The Joint Commission.
    b. If the Surgical Incision 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 for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    c. If Surgical Incision Date equals a Non Unable To Determine Value, continue processing and proceed to Antibiotic Received.

15. Check Antibiotic Received
    a. If Antibiotic Received equals 1 or 2, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code

b. If Antibiotic Received equals 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
c. If Antibiotic Received equals 3, continue processing and proceed to step 19 and check Antibiotic Name. Do not check ICD-9-CM Principal Procedure Code, Oral Antibiotics or Antibiotic Received.

16. Recheck ICD-9-CM Principal Procedure Code only if Antibiotic Received equals 1 or 2
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and proceed to check Oral Antibiotics.

17. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    c. If Oral Antibiotics equals Yes, continue processing and proceed to recheck Antibiotic Received.

18. Recheck Antibiotic Received
    a. If Antibiotic Received equals 1, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If Antibiotic Received equals 2, continue processing and proceed to Antibiotic Name.

19. Check Antibiotic Name
    a. If the Antibiotic Grid is not populated, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate

(SCIP-Inf-1a) for The Joint Commission. Note: The front-end edits reject cases containing invalid data and/or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or Unable to Determine.

b. If the Antibiotic Name is on Table 2.1, continue processing and proceed to Antibiotic Administration Route.

20. Check Antibiotic Administration Route
    a. If the Antibiotic Administration Route is equal to 3 or 10 for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Antibiotic Administration Route is equal to 1 or 2 for any antibiotic dose, continue processing and proceed to Antibiotic Administration Date. Proceed only with antibiotic doses on Table 2.1 that are administered via routes 1 or 2.

21. Check Antibiotic Administration Date
    a. If the Antibiotic Administration Date is equal to Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Antibiotic Administration Date is equal to a Non Unable to Determine date for at least one antibiotic dose, continue processing and proceed to the Antibiotic Days I calculation. Note: Proceed only with antibiotic doses that have an associated non Unable to Determine date.

22. Calculate Antibiotic Days I. Antibiotic Days I, in days, is equal to the Surgical Incision Date minus the Antibiotic Administration Date.

23. Check Antibiotic Days I
    a. If the Antibiotic Days I is greater than 1 for at least one antibiotic dose, continue processing and recheck the ICD-9-CM Principal Procedure Code.
    b. If the Antibiotic Days I is less than or equal to 1 for all antibiotic doses, continue processing. Proceed to step 26 and recheck Antibiotics Days I. Do not recheck ICD-9-CM Principal Procedure Code or Oral Antibiotics.

24. Recheck ICD-9-CM Principal Procedure Code only if the Antibiotic Days I is greater than 1 for at least one antibiotic dose.

a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and check Oral Antibiotics.

25. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    c. If Oral Antibiotics equals Yes, continue processing and proceed to step 27 and check Surgical Incision Time. Do not recheck Antibiotic Days I.

26. Recheck Antibiotic Days I
    a. If the Antibiotic Days I is less than zero for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Antibiotic Days I is greater than or equal to zero for any antibiotic dose, continue processing and proceed to Surgical Incision Time.

27. Check Surgical Incision Time
    a. If the Surgical Incision Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Surgical Incision Time is equal to Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    c. If the Surgical Incision Time is equal to a Non Unable to Determine Value, continue processing and check Antibiotic Administration Time.

28. Check Antibiotic Administration Time
    a. If the Antibiotic Administration Time equals Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Antibiotic Administration Time equals a Non Unable to Determine time for at least one antibiotic dose, continue processing and proceed to the Antibiotic Timing I calculation. Note: Proceed only with antibiotic doses that have an associated non Unable to Determine time.

29. Calculate Antibiotic Timing I. Antibiotic Timing I, in minutes, is equal to the Surgical Incision Date and Surgical Incision Time minus the Antibiotic Administration Date and Antibiotic Administration Time.

30. Check Antibiotic Timing I
    a. If the Antibiotic Timing I is greater than 1440 minutes for any antibiotic dose, continue processing and recheck the ICD-9-CM Principal Procedure Code.
    b. If the Antibiotic Timing I is less than or equal to 1440 minutes for all antibiotic doses, continue processing. Proceed to step 33 and recheck Antibiotic Timing I. Do not recheck ICD-9-CM Principal Procedure Code or Oral Antibiotics.

31. Recheck ICD-9-CM Principal Procedure Code only if the Antibiotic Timing I is greater than 1440 minutes for any antibiotic dose.
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and check Oral Antibiotics.

32. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop

processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.

c. If Oral Antibiotics equals Yes, continue processing and proceed to recheck Antibiotic Timing I.

33. Recheck Antibiotic Timing I
    a. If the Antibiotic Timing I is greater than or equal to zero minutes and less than or equal to 60 minutes for at least one antibiotic dose, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Antibiotic Timing I is less than zero minutes or greater than 60 minutes for all antibiotic doses, continue processing and recheck Antibiotic Name.

34. Recheck Antibiotic Name
    a. If the Antibiotic Name is on Table 3.8 or Table 3.10 for at least one dose, continue processing and recheck Antibiotic Timing I.
    b. If the Antibiotic Name is not on Table 3.8 or Table 3.10 for any dose, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Do not recheck Antibiotic Timing I. Stop processing for CMS. Proceed to step 36 and check the Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.

35. Recheck Antibiotic Timing I
    a. If the Antibiotic Timing I is greater than 60 minutes and less than or equal to 120 minutes for at least one antibiotic dose on Table 3.8 or Table 3.10, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.
    b. If the Antibiotic Timing I is less than zero minutes or greater than 120 minutes for all antibiotic doses on Table 3.8 or Table 3.10, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-1a) for The Joint Commission.

36. For The Joint Commission Only, continue processing for the Stratified Measures. Note: Initialize the Measure Category Assignment for each strata measure (b-g) to equal B, not in the Measure Population. Do not change the Measure Category Assignment that was already calculated for the overall rate (SCIP-Inf-1a). The

rest of the algorithm will reset the appropriate Measure Category Assignment to be equal to the overall rate's (SCIP-Inf-1a) Measure Category Assignment.

37. Check Overall Rate Category Assignment
    a. If the Overall Rate Category Assignment is equal to B or X, set the Measure Category Assignment for the strata measures (SCIP-Inf-1b through SCIP-Inf-1h) to equal B, not in the Measure Population. Stop processing.
    b. If the Overall Rate Category Assignment is equal to D or E, continue processing and check the ICD-9-CM Principal Procedure Code.

38. Check ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.01, for Stratified Measure SCIP-Inf-1b, set the Measure Category Assignment for measure SCIP-Inf-1b to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

39. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.02, for Stratified Measure SCIP-Inf-1c, set the Measure Category Assignment for measure SCIP-Inf-1c to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

40. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.04, for Stratified Measure SCIP-Inf-1d, set the Measure Category Assignment for measure SCIP-Inf-1d to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

41. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.05, for Stratified Measure SCIP-Inf-1e, set the Measure Category Assignment for measure

SCIP-Inf-1e to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

42. Recheck ICD-9-CM Principal Procedure Code

a. If the ICD-9-CM Principal Procedure Code is on Table 5.03, for Stratified Measure SCIP-Inf-1f, set the Measure Category Assignment for measure SCIP-Inf-1f to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

43. Recheck ICD-9-CM Principal Procedure Code

a. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07, for Stratified Measure SCIP-Inf-1g, set the Measure Category Assignment for measure SCIP-Inf-1g to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.08, for Stratified Measure SCIP-Inf-1h, set the Measure Category Assignment for measure SCIP-Inf-1h to equal the Measure Category Assignment for measure SCIP-Inf-1a. Stop processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID #: SCIP-Inf-2

Set Measure ID#	Performance Measure Name
SCIP-Inf-2a	Prophylactic Antibiotic Selection for Surgical Patients - Overall Rate
SCIP-Inf-2b	Prophylactic Antibiotic Selection for Surgical Patients - CABG
SCIP-Inf-2c	Prophylactic Antibiotic Selection for Surgical Patients - Other Cardiac Surgery
SCIP-Inf-2d	Prophylactic Antibiotic Selection for Surgical Patients - Hip Arthroplasty
SCIP-Inf-2e	Prophylactic Antibiotic Selection for Surgical Patients - Knee Arthroplasty
SCIP-Inf-2f	Prophylactic Antibiotic Selection for Surgical Patients - Colon Surgery
SCIP-Inf-2g	Prophylactic Antibiotic Selection for Surgical Patients - Hysterectomy
SCIP-Inf-2h	Prophylactic Antibiotic Selection for Surgical Patients - Vascular Surgery

Performance Measure Name: Prophylactic Antibiotic Selection for Surgical Patients

Description: Surgical patients who received prophylactic antibiotics consistent with current guidelines (specific to each type of surgical procedure).

Rationale: A goal of prophylaxis with antibiotics is to use an agent that is safe, cost-effective, and has a spectrum of action that covers most of the probable intraoperative contaminants for the operation. First or second-generation cephalosporins satisfy these criteria for most operations, although anaerobic coverage is needed for colon surgery. Vancomycin is not recommended for routine use because of the potential for development of antibiotic resistance, but is acceptable if a patient is allergic to beta-lactams, as are fluoroquinolones and clindamycin in selected situations.

Type of Measure: Process

Improvement Noted As: An increase in the rate.

Numerator Statement: Number of surgical patients who received prophylactic antibiotics recommended for their specific surgical procedure.

Included populations: Not Applicable

Excluded Populations: None

Data Elements:

- *Antibiotic Administration Route*
- *Antibiotic Allergy*
- *Antibiotic Name*
- *Oral Antibiotics*
- *Vancomycin*

The antibiotic regimens described in the table which follows later in this section reflect the combined, published recommendations of the American Society of Health-System Pharmacists, the Medical Letter, the Infectious Diseases Society of America, the Sanford Guide to Antimicrobial Therapy 2009, and the Surgical Infection Society.

Denominator Statement: All selected surgical patients with no evidence of prior infection.

Included Populations:

- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

AND

- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.01-5.08 for ICD-9-CM codes).

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a length of Stay greater than 120 days
- Patients who had a principal diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 5.09 for ICD-9-CM codes)
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients who expired perioperatively
- Patients who were receiving antibiotics more than 24 hours prior to surgery (except colon surgery patients taking oral prophylactic antibiotics)
- Patients who were receiving antibiotics within 24 hours prior to arrival (except colon surgery patients taking oral prophylactic antibiotics)
- Patients who did not receive any antibiotics before or during surgery, or within 24 hours after *Anesthesia End Time* (i.e., patient did not receive prophylactic antibiotics)
- Patients who did not receive any antibiotics during this hospitalization

Data Elements:

- *Anesthesia End Date*
- *Anesthesia End Time*
- *Anesthesia Start Date*
- *Admission Date*
- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Antibiotic Received*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Infection Prior to Anesthesia*
- *Laparoscope*
- *Perioperative Death*
- *Surgical Incision Date*
- *Surgical Incision Time*

Risk Adjustment: No

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

Data Accuracy: Abstracted antibiotics are those administered from the time of arrival through the first 48 hours (72 hours for CABG or Other Cardiac Surgery) after the *Anesthesia End Time.* Refer to Appendix C, Table 2.1, which contains a complete listing of antibiotics.

Measure Analysis Suggestions: Consideration may be given to relating this measure to SCIP-Inf-1 and SCIP-Inf-3 in order to evaluate which aspects of antibiotic prophylaxis would most benefit from an improvement effort. The process owners for selection of appropriate antibiotics could include physicians/APNs/PAs and hospital committees (e.g., QA, Infection Control, Pharmacy and Therapeutics, Surgical Section Subcommittees, etc.) any of which may choose to address this physician/APN/PA practice issue as part of a larger surgical infection prevention initiative.

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: Overall aggregate rate for all surgeries and stratified rates by data element *ICD-9-CM Principal Procedure Code*, generated from count data reported as a proportion.

Selected References:

- Bratzler DW, Houck PM, for the Surgical Infection Prevention Guidelines Writers Group. Antimicrobial prophylaxis for surgery: An advisory statement from the

National Surgical Infection Prevention Project. *CID*. 2004:38(15 June):1706-1715.

- Mangram AJ, Horan TC, Pearson ML, et al. Guidelines for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol.* 1999;20:247-280.
- American Society of Health-System Pharmacists. ASHP therapeutic guidelines on antimicrobial prophylaxis in surgery. *Am J Health Syst Pharm.* 1999;56:1839-1888.
- No author listed. *The Medical letter*. Antimicrobial prophylaxis for Surgery. *Med Lett Drugs Ther.* 2009; 82: 47-52.
- Dellinger EP, Gross PA, Barrett TL, et al. Quality standard for antimicrobial prophylaxis in surgical procedures. *Clin Infect Dis.* 1994;18:422-427.
- Gilbert DN, Moellering RC Jr., Elipoulos GM, Chamber HF, Saag MS, eds. *The Sanford Guide to Antimicrobial Therapy* 2009. 39st ed. Sperryville, VA: Antimicrobial Therapy, Inc; 2009.
- Itani KMF, Wilson SE, Awad SS, Jensen EH, Finn TS, Abramson MA. Ertapenem versus cefotetan prophylaxis in elective colorectal surgery. *N Engl J Med*. 2006 Dec 21; 355 (25): 2640-2651.
- Page CP, Bohnen JM, Fletcher JR, et al. Antimicrobial prophylaxis for surgical wounds. *Arch Surg.* 1993;128:79-88.
- American College of Obstetricians and Gynecologists (ACOG) Committee on Practice Bulletins ACOG Practice Bulletin No 104 Antibiotic prophylaxis for gynecologic procedures. *Obstet Gynecol* May 2009; 113(5) : 1180-1189.

Prophylactic Antibiotic Regimen Selection for Surgery

Surgical Procedure	Approved Antibiotics
CABG, Other Cardiac or Vascular	Cefazolin, Cefuroxime,Table 3.1 or Vancomycin[1] Table 3.8 If β-lactam allergy: Vancomycin[2] Table 3.8 or Clindamycin[2] Table 3.9
Hip/Knee Arthroplasty	Cefazolin or Cefuroxime Table 3.2 or Vancomycin[1] Table 3.8 If β-lactam allergy: Vancomycin[2] Table 3.8 or Clindamycin[2] Table 3.9
Colon	Cefotetan, Cefoxitin, Ampicillin/Sulbactam Table 3.5, or Ertapenem[3] Table 3.6b **OR** Cefazolin or Cefuroxime Table 3.2 + Metronidazole Table 3.6a If β-lactam allergy: Clindamycin Table 3.9 + Aminoglycoside Table 2.11 or Clindamycin Table 3.9 + Quinolone Table 3.12, or Clindamycin Table 3.9 + Aztreonam Table 2.7 **OR** Metronidazole Table 3.6a with Aminoglycoside Table 2.11, or Metronidazole Table 3.6a + Quinolone Table 3.12
Hysterectomy	Cefotetan, Cefazolin, Cefoxitin, Cefuroxime, or Ampicillin/Sulbactam Table 3.7 If β-lactam allergy: Clindamycin Table 3.9 + Aminoglycoside Table 2.11 or Clindamycin Table 3.9 + Quinolone Table 3.12 or Clindamycin Table 3.9 + Aztreonam Table 2.7 **OR** Metronidazole Table 3.6a + Aminoglycoside Table 2.11 or Metronidazole Table 3.6a + Quinolone Table 3.12

Special Considerations:

[1] Vancomycin is acceptable with a physician/APN/PA/pharmacist documented justification for its use (see data element *Vancomycin*)

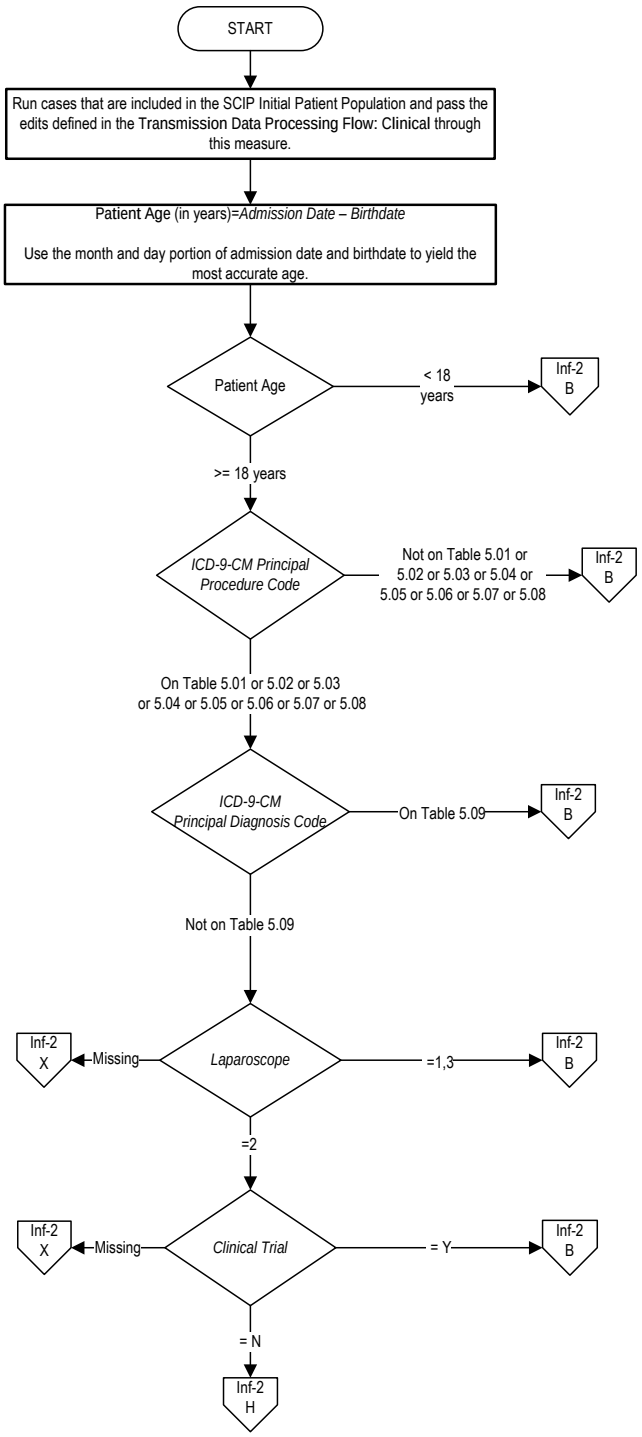
[2] For cardiac, orthopedic, and vascular surgery, if the patient is allergic to beta-lactam antibiotics, Vancomycin or Clindamycin are acceptable substitutes.

[3] A single dose of ertapenem is recommended for colon procedures.

SCIP-Inf-2: Prophylactic Antibiotic Selection for Surgical Patients

Numerator: Number of surgical patients who received prophylactic antibiotics recommended for their specific surgical procedure.

Denominator: All selected surgical patients with no evidence of prior Infection.

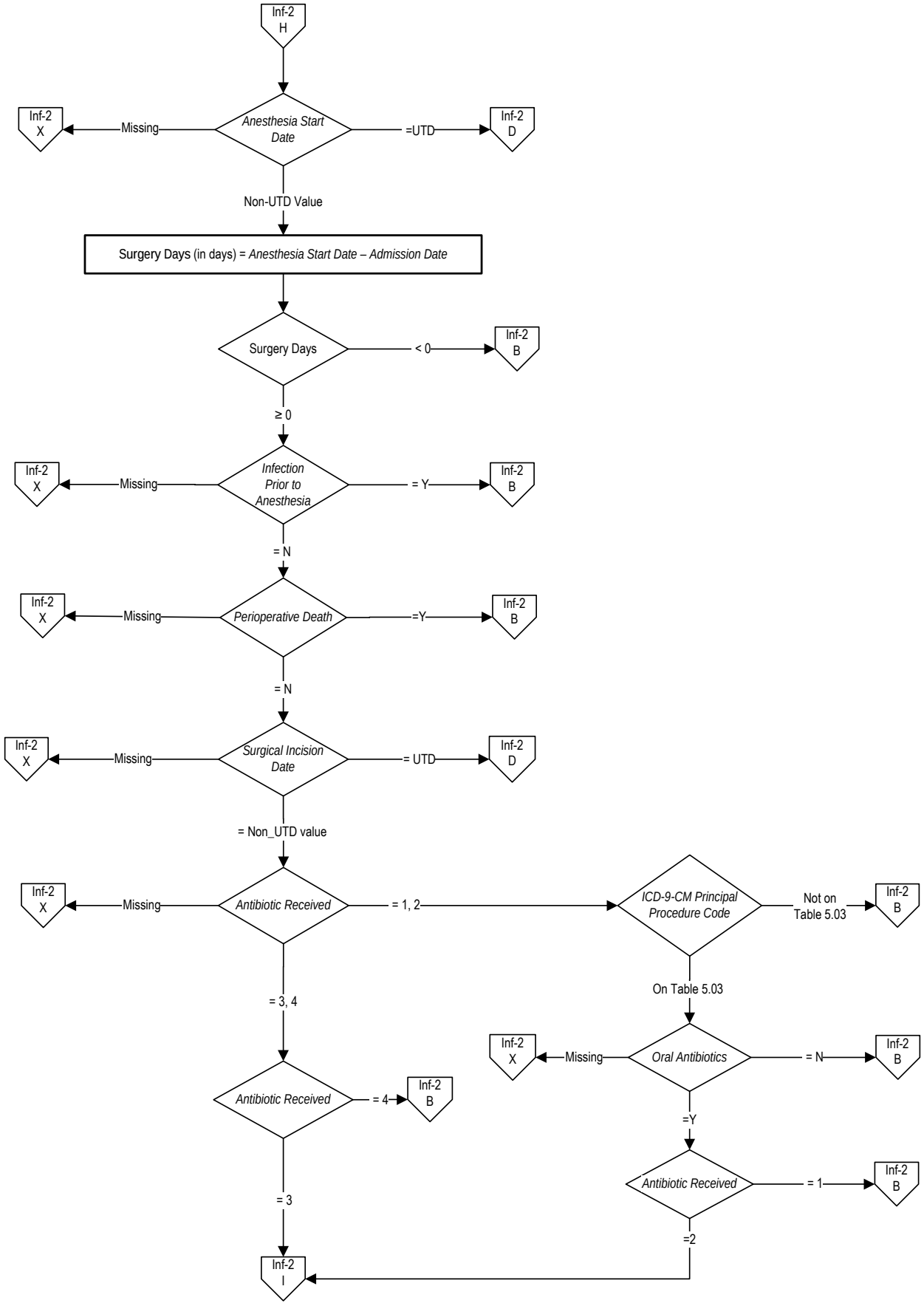


Variable Key:
Patient Age
Antibiotic Days I
Antibiotic Timing I
Antibiotic Days II
Antibiotic Timing II
Surgery Days

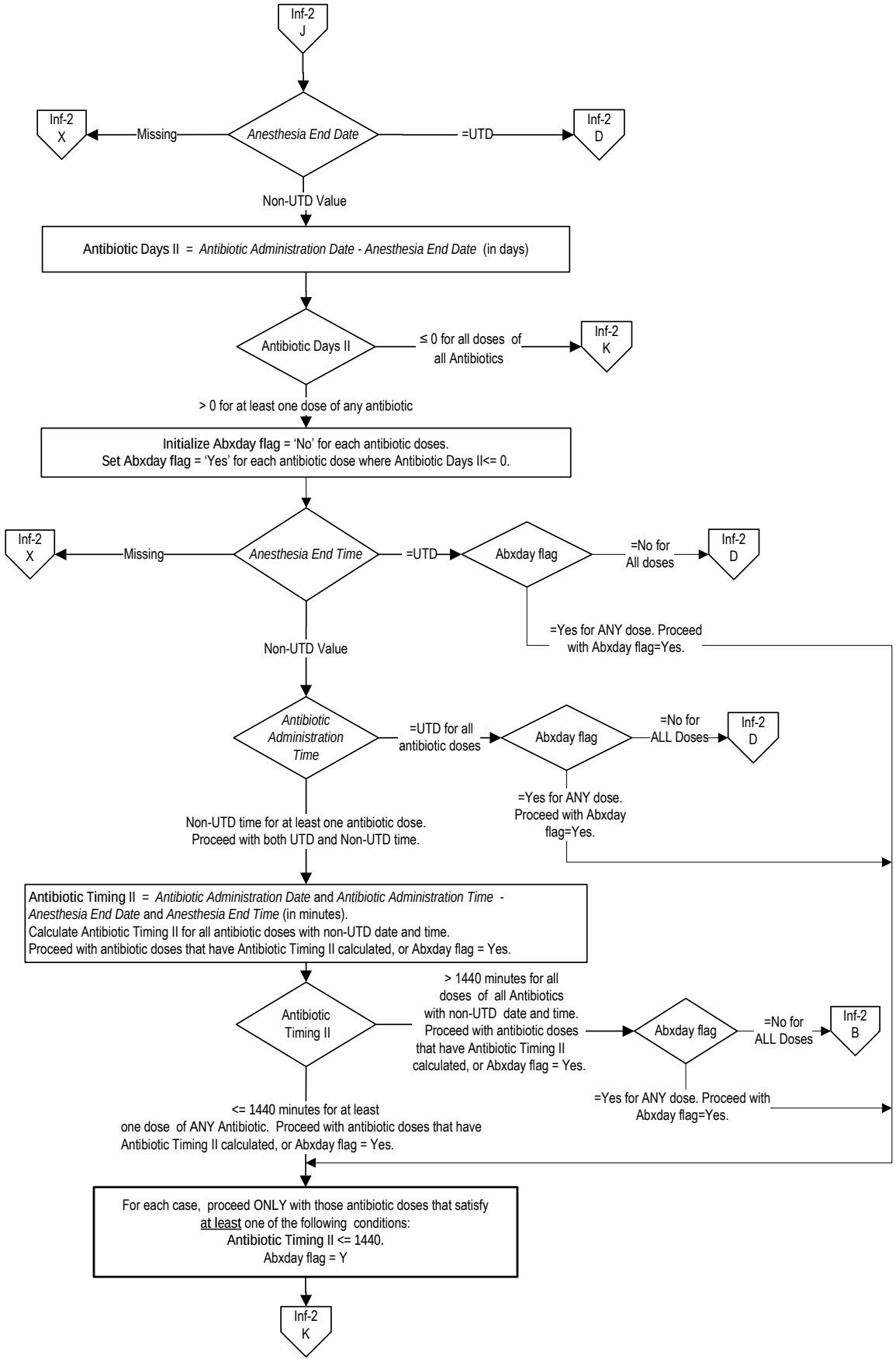
Stratification Table:

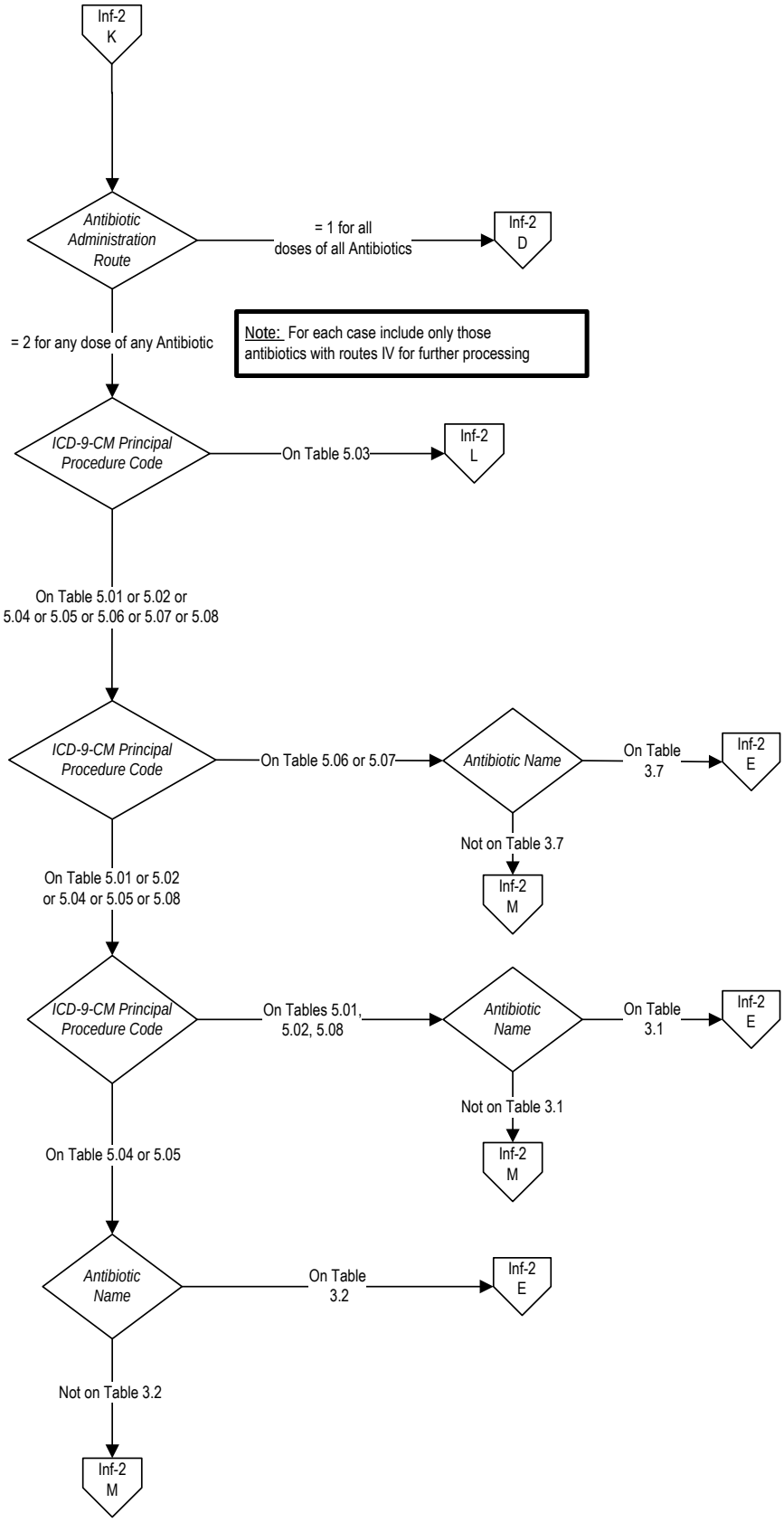
Set#	Stratified By	*Principal Procedure Code (Allowable Value)
SCIP-Inf2a	Overall Rate	**
SCIP-Inf2b	CABG	Table 5.01
SCIP-Inf2c	Other Cardiac Surgery	Table 5.02
SCIP-Inf2d	Hip Arthroplasty	Table 5.04
SCIP-Inf2e	Knee Arthroplasty	Table 5.05
SCIP-Inf2f	Colon Surgery	Table 5.03
SCIP-Inf2g	Hysterectomy	Table 5.06 Or 5.07
SCIP-Inf2h	Vascular Surgery	Table 5.08

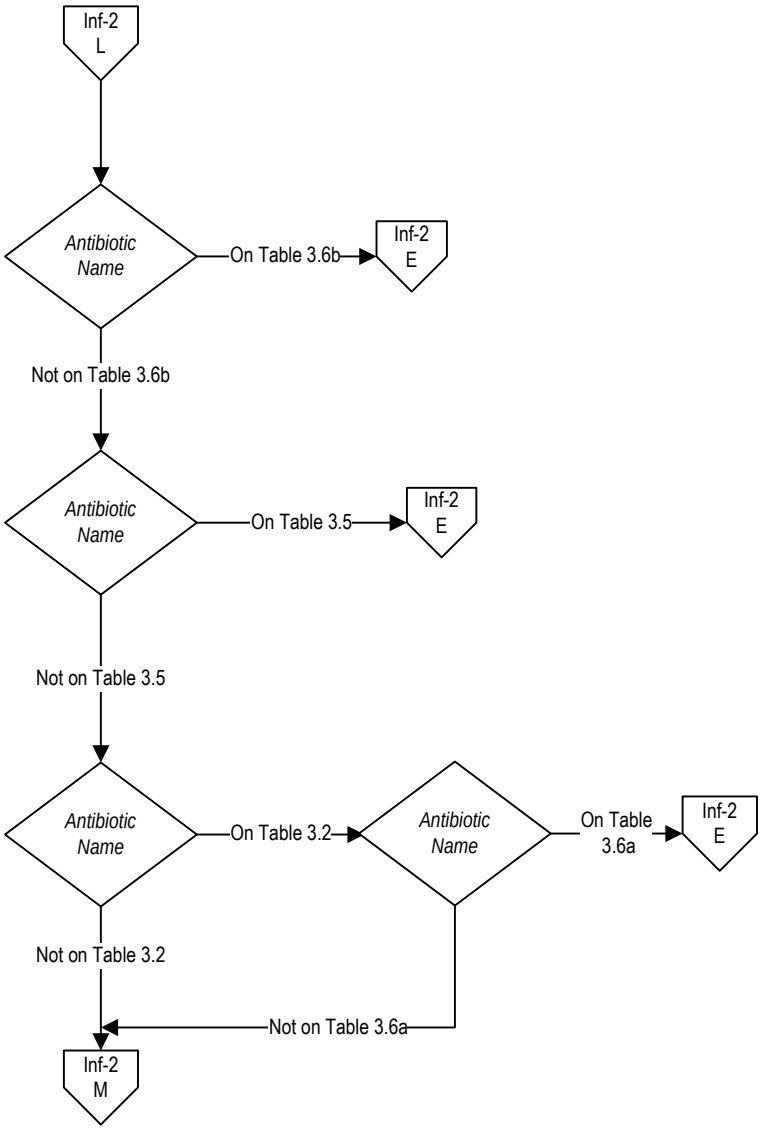
* This refers to the data element '*ICD-9-CM Principal Procedure Code*'. Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.
** No allowable value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.

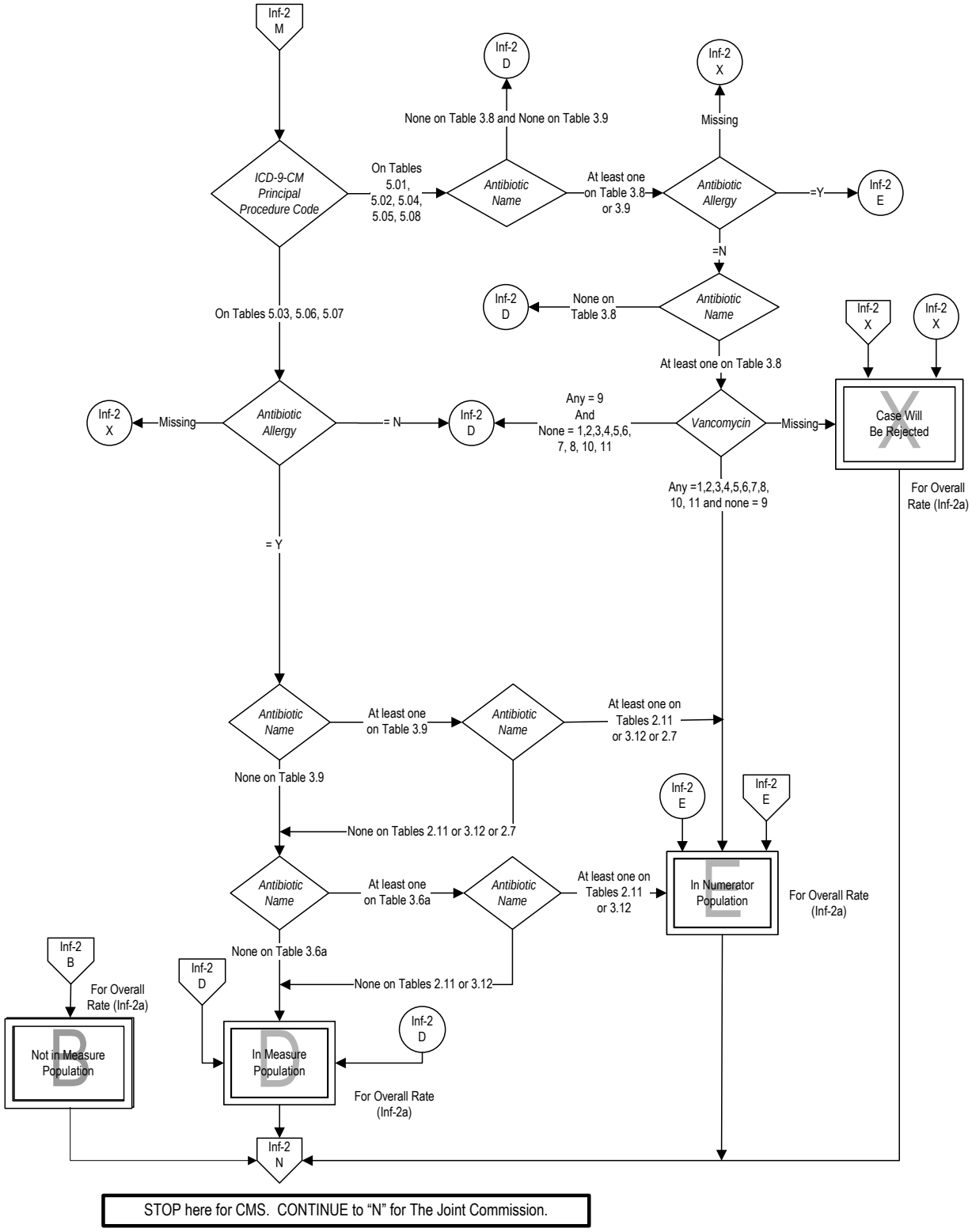

Inf-2 H
Anesthesia Start Date
Missing
Inf-2 X
=UTD
Inf-2 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
Inf-2 B
≥ 0
Infection Prior to Anesthesia
Missing
Inf-2 X
= Y
Inf-2 B
= N
Perioperative Death
Missing
Inf-2 X
=Y
Inf-2 B
= N
Surgical Incision Date
Missing
Inf-2 X
= UTD
Inf-2 D
= Non_UTD value
Antibiotic Received
Missing
Inf-2 X
= 1, 2
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-2 B
On Table 5.03
= 3, 4
Antibiotic Received
= 4
Inf-2 B
= 3
Oral Antibiotics
Missing
Inf-2 X
= N
Inf-2 B
=Y
Antibiotic Received
= 1
Inf-2 B
=2
Inf-2 I

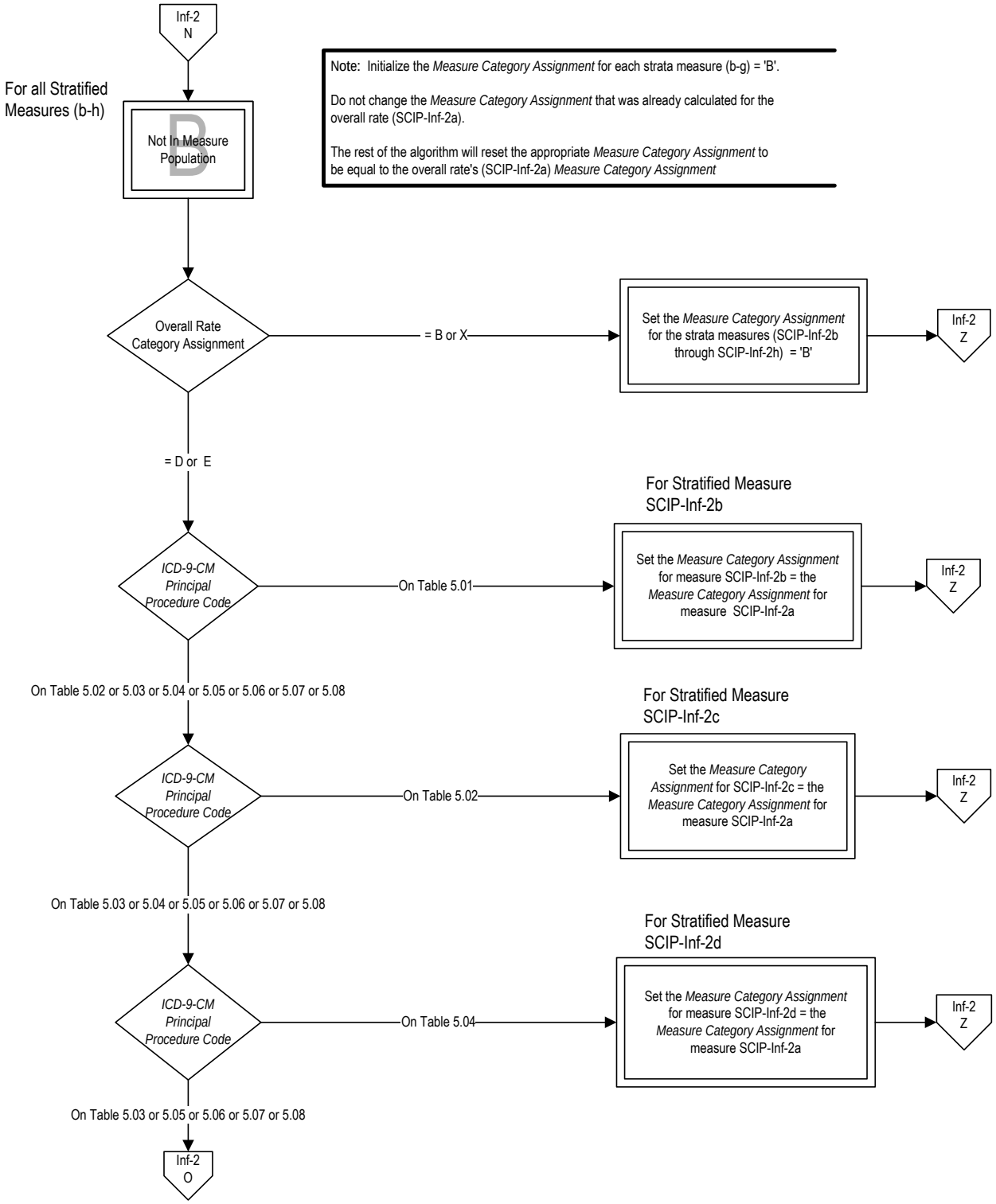
Inf-2 I
Antibiotic Name
Antibiotic Grid Not Populated
Inf-2 X
Note: The front-end edits reject cases containing invalid data and/or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or 'UTD'.
On Table 2.1
Antibiotic Administration Route
=3,10 for all antibiotic doses
Inf-2 B
=1,2 for any antibiotic dose
Proceed only with antibiotic doses on Table 2.1 that are administered via routes '1' or '2'.
Antibiotic Administration Date
=UTD for all antibiotic doses
Inf-2 D
Note: Proceed only with antibiotic doses that have an associated non-UTD date.
Non-UTD date for at least one antibiotic dose
Antibiotic Days I = Surgical Incision Date - Antibiotic Administration Date (in days)
Antibiotic Days I
> 1 for at least one antibiotic dose
≤1 for all antibiotic doses
Antibiotic Days I
≤ 0 for ALL antibiotic doses
Inf-2 J
=1 for ANY antibiotic dose
Surgical Incision Time
Missing
Inf-2 X
=UTD
Inf-2 D
Non-UTD Value
Antibiotic Administration Time
= UTD for all antibiotic doses
Inf-2 D
Non-UTD time for at least one antibiotic dose
Antibiotic Administration Time
=UTD for ANY antibiotic dose with 'Antibiotic Days I = 1'
Inf-2 D
Non-UTD time for ALL antibiotic doses with 'Antibiotic Days I = 1'
Antibiotic Timing I = Surgical Incision Date and Surgical Incision Time - Antibiotic Administration Date and Antibiotic Administration Time (in minutes).
Calculate Antibiotic Timing I for all antibiotic doses with non-UTD date and time.
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.
Antibiotic Timing I
> 1440 minutes for any antibiotic dose.
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-2 B
On Table 5.03
≤ 1440 minutes for all antibiotic doses with non-UTD date and time.
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.
Oral Antibiotics
Missing
Inf-2 X
= N
Inf-2 B
=Y
Inf-2 J

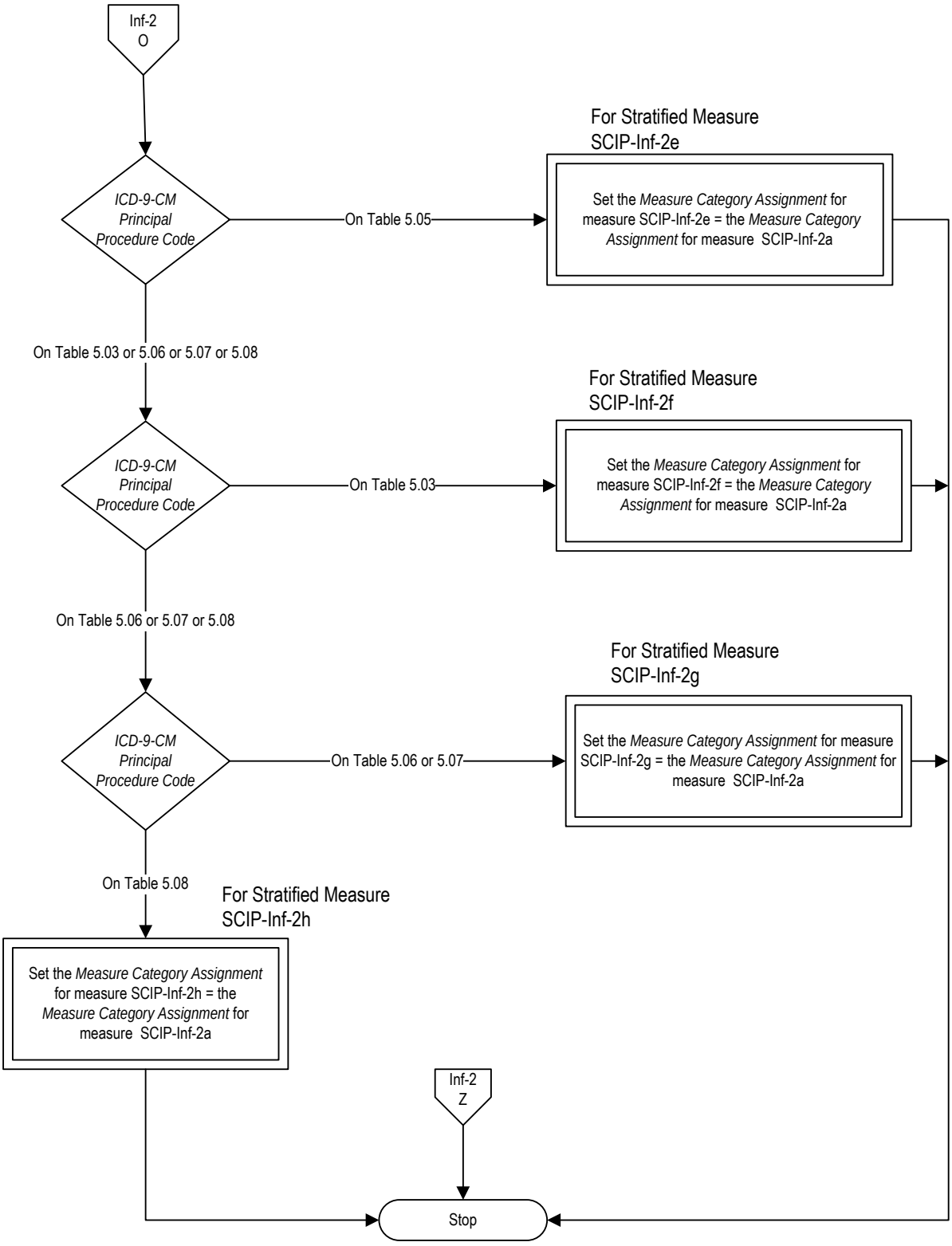

Inf-2 J
Anesthesia End Date
Missing
Inf-2 X
=UTD
Inf-2 D
Non-UTD Value
Antibiotic Days II = Antibiotic Administration Date - Anesthesia End Date (in days)
Antibiotic Days II
≤ 0 for all doses of all Antibiotics
Inf-2 K
> 0 for at least one dose of any antibiotic
Initialize Abxday flag = 'No' for each antibiotic doses.
Set Abxday flag = 'Yes' for each antibiotic dose where Antibiotic Days II<= 0.
Anesthesia End Time
Missing
Inf-2 X
=UTD
Abxday flag
=No for All doses
Inf-2 D
=Yes for ANY dose. Proceed with Abxday flag=Yes.
Non-UTD Value
Antibiotic Administration Time
=UTD for all antibiotic doses
Abxday flag
=No for ALL Doses
Inf-2 D
=Yes for ANY dose. Proceed with Abxday flag=Yes.
Non-UTD time for at least one antibiotic dose. Proceed with both UTD and Non-UTD time.
Antibiotic Timing II = Antibiotic Administration Date and Antibiotic Administration Time - Anesthesia End Date and Anesthesia End Time (in minutes).
Calculate Antibiotic Timing II for all antibiotic doses with non-UTD date and time.
Proceed with antibiotic doses that have Antibiotic Timing II calculated, or Abxday flag = Yes.
Antibiotic Timing II
> 1440 minutes for all doses of all Antibiotics with non-UTD date and time. Proceed with antibiotic doses that have Antibiotic Timing II calculated, or Abxday flag = Yes.
Abxday flag
=No for ALL Doses
Inf-2 B
=Yes for ANY dose. Proceed with Abxday flag=Yes.
<= 1440 minutes for at least one dose of ANY Antibiotic. Proceed with antibiotic doses that have Antibiotic Timing II calculated, or Abxday flag = Yes.
For each case, proceed ONLY with those antibiotic doses that satisfy at least one of the following conditions:
Antibiotic Timing II <= 1440.
Abxday flag = Y
Inf-2 K


Inf-2 K
Antibiotic Administration Route
= 1 for all doses of all Antibiotics
Inf-2 D
= 2 for any dose of any Antibiotic
Note: For each case include only those antibiotics with routes IV for further processing
ICD-9-CM Principal Procedure Code
On Table 5.03
Inf-2 L
On Table 5.01 or 5.02 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
ICD-9-CM Principal Procedure Code
On Table 5.06 or 5.07
Antibiotic Name
On Table 3.7
Inf-2 E
Not on Table 3.7
Inf-2 M
On Table 5.01 or 5.02 or 5.04 or 5.05 or 5.08
ICD-9-CM Principal Procedure Code
On Tables 5.01, 5.02, 5.08
Antibiotic Name
On Table 3.1
Inf-2 E
Not on Table 3.1
Inf-2 M
On Table 5.04 or 5.05
Antibiotic Name
On Table 3.2
Inf-2 E
Not on Table 3.2
Inf-2 M


Inf-2
L
Antibiotic
Name
On Table 3.6b
Inf-2
E
Not on Table 3.6b
Antibiotic
Name
On Table 3.5
Inf-2
E
Not on Table 3.5
Antibiotic
Name
On Table 3.2
Antibiotic
Name
On Table
3.6a
Inf-2
E
Not on Table 3.2
Not on Table 3.6a
Inf-2
M


Inf-2 M
ICD-9-CM Principal Procedure Code
On Tables 5.01, 5.02, 5.04, 5.05, 5.08
Antibiotic Name
None on Table 3.8 and None on Table 3.9
Inf-2 D
At least one on Table 3.8 or 3.9
Antibiotic Allergy
Missing
Inf-2 X
=Y
Inf-2 E
=N
Antibiotic Name
None on Table 3.8
Inf-2 D
On Tables 5.03, 5.06, 5.07
At least one on Table 3.8
Inf-2 X
Inf-2 X
Antibiotic Allergy
Missing
Inf-2 X
= N
Inf-2 D
Vancomycin
Any = 9 And None = 1,2,3,4,5,6, 7, 8, 10, 11
Missing
Case Will Be Rejected
X
For Overall Rate (Inf-2a)
Any =1,2,3,4,5,6,7,8, 10, 11 and none = 9
= Y
Antibiotic Name
At least one on Table 3.9
Antibiotic Name
At least one on Tables 2.11 or 3.12 or 2.7
None on Table 3.9
None on Tables 2.11 or 3.12 or 2.7
Inf-2 E
Inf-2 E
Antibiotic Name
At least one on Table 3.6a
Antibiotic Name
At least one on Tables 2.11 or 3.12
In Numerator Population
E
For Overall Rate (Inf-2a)
None on Table 3.6a
None on Tables 2.11 or 3.12
Inf-2 B
For Overall Rate (Inf-2a)
Inf-2 D
Not in Measure Population
B
In Measure Population
D
Inf-2 D
For Overall Rate (Inf-2a)
Inf-2 N
STOP here for CMS. CONTINUE to "N" for The Joint Commission.


Inf-2
N
For all Stratified
Measures (b-h)
Not In Measure
Population
B
Note: Initialize the *Measure Category Assignment* for each strata measure (b-g) = 'B'.
Do not change the *Measure Category Assignment* that was already calculated for the overall rate (SCIP-Inf-2a).
The rest of the algorithm will reset the appropriate *Measure Category Assignment* to be equal to the overall rate's (SCIP-Inf-2a) *Measure Category Assignment*
Overall Rate
Category Assignment
= B or X
Set the *Measure Category Assignment* for the strata measures (SCIP-Inf-2b through SCIP-Inf-2h) = 'B'
Inf-2
Z
= D or E
For Stratified Measure
SCIP-Inf-2b
ICD-9-CM Principal Procedure Code
On Table 5.01
Set the *Measure Category Assignment* for measure SCIP-Inf-2b = the *Measure Category Assignment* for measure SCIP-Inf-2a
Inf-2
Z
On Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
For Stratified Measure
SCIP-Inf-2c
ICD-9-CM Principal Procedure Code
On Table 5.02
Set the *Measure Category Assignment* for SCIP-Inf-2c = the *Measure Category Assignment* for measure SCIP-Inf-2a
Inf-2
Z
On Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
For Stratified Measure
SCIP-Inf-2d
ICD-9-CM Principal Procedure Code
On Table 5.04
Set the *Measure Category Assignment* for measure SCIP-Inf-2d = the *Measure Category Assignment* for measure SCIP-Inf-2a
Inf-2
Z
On Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08
Inf-2
O


Inf-2
O
ICD-9-CM Principal Procedure Code
On Table 5.05
For Stratified Measure
SCIP-Inf-2e
Set the Measure Category Assignment for measure SCIP-Inf-2e = the Measure Category Assignment for measure SCIP-Inf-2a
On Table 5.03 or 5.06 or 5.07 or 5.08
ICD-9-CM Principal Procedure Code
On Table 5.03
For Stratified Measure
SCIP-Inf-2f
Set the Measure Category Assignment for measure SCIP-Inf-2f = the Measure Category Assignment for measure SCIP-Inf-2a
On Table 5.06 or 5.07 or 5.08
ICD-9-CM Principal Procedure Code
On Table 5.06 or 5.07
For Stratified Measure
SCIP-Inf-2g
Set the Measure Category Assignment for measure SCIP-Inf-2g = the Measure Category Assignment for measure SCIP-Inf-2a
On Table 5.08
For Stratified Measure
SCIP-Inf-2h
Set the Measure Category Assignment for measure SCIP-Inf-2h = the Measure Category Assignment for measure SCIP-Inf-2a
Inf-2
Z
Stop

SCIP-Infection (Inf)-2: Prophylactic Antibiotics Selection for Surgical Patients

Numerator: Number of surgical patients who received prophylactic antibiotics recommended for their specific surgical procedure.

Denominator: All selected surgical patients with no evidence of prior infection.

Variable Key: Patient Age, Antibiotic Days I, Antibiotic Timing I, Antibiotic Days II, Antibiotic Timing II, Surgery Days

Stratification Table

The Stratification Table includes the Set Number, Stratified By, and the Principal Procedure Code (Allowable Value). The Principal Procedure Code refers to the data element ICD-9-CM Principal Procedure Code. Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.

Set Number	Stratified By the Overall Rate	Principal Procedure Code
SCIP-INF 2a	Overall Rate	No allowable value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.
SCIP-INF 2b	Coronary Artery Bypass Graft (CABG)	Table 5.01
SCIP-INF 2c	Other Cardiac Surgery	Table 5.02
SCIP-INF 2d	Hip Arthroplasty	Table 5.04
SCIP-INF 2e	Knee Arthroplasty	Table 5.05
SCIP-INF 2f	Colon Surgery	Table 5.03
SCIP-INF 2g	Hysterectomy	Table 5.06 or Table 5.07
SCIP-INF 2h	Vascular Surgery	Table 5.08

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for Centers for Medicare and Medicaid Services (CMS). Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and proceed to recheck ICD-9-CM Principal Diagnosis Code.

5. Check ICD-9-CM Principal Diagnosis Code
    a. If the ICD-9-CM Principal Diagnosis Code is on Table 5.09, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the ICD-9-CM Principal Diagnosis Code is not on Table 5.09, continue processing and proceed to Laparoscope.

6. Check Laparoscope
    a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Laparoscope equals 1 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If Laparoscope equals 2, continue processing and proceed to Clinical Trial.

7. 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 for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    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 for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

c. If Clinical Trial equals No, continue processing and proceed to Anesthesia Start Date.

8. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   b. If the Anesthesia Start 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 for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   c. If Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

9. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

10. Check Surgery Days
   a. If the Surgery Days is less than zero, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   b. If the Surgery Days is greater than or equal to zero, continue processing and proceed to Infection Prior to Anesthesia.

11. Check Infection Prior to Anesthesia
   a. If Infection Prior to Anesthesia is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   b. If Infection Prior to Anesthesia equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   c. If Infection Prior to Anesthesia equals No, continue processing and proceed to Perioperative Death.

12. Check Perioperative Death
   a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS.

Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

b. If Perioperative Death equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

c. If Perioperative Death equals No, continue processing and proceed to Surgical Incision Date.

13. Check Surgical Incision Date

a. If the Surgical Incision Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP- Inf-2a) for The Joint Commission.

b. If the Surgical Incision 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 for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

c. If Surgical Incision Date equals a Non Unable To Determine Value, continue processing and proceed to Antibiotic Received.

14. Check Antibiotic Received

a. If Antibiotic Received equals 1 or 2, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code

b. If Antibiotic Received equals 4, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

c. If Antibiotic Received equals 3, continue processing and proceed to step 18 and check Antibiotic Name. Do not check ICD-9-CM Principal Procedure Code, Oral Antibiotics or Antibiotic Received.

15. Recheck ICD-9-CM Principal Procedure Code only if Antibiotic Received equals 1 or 2

a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and proceed to check Oral Antibiotics.

16. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If Oral Antibiotics equals Yes, continue processing and proceed to recheck Antibiotic Received.

17. Recheck Antibiotic Received
    a. If Antibiotic Received equals 1, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Antibiotic Received equals 2, continue processing and proceed to Antibiotic Name.

18. Check Antibiotic Name
    a. If the Antibiotic Grid is not populated, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission. Note: The front-end edits reject cases containing invalid data and/or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or Unable to Determine.
    b. If the Antibiotic Name is on Table 2.1, continue processing and proceed to Antibiotic Administration Route.

19. Check Antibiotic Administration Route
    a. If the Antibiotic Administration Route is equal to 3 or 10 for all antibiotic doses, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Antibiotic Administration Route is equal to 1 or 2 for any antibiotic dose, continue processing and proceed to Antibiotic Administration Date. Proceed only with antibiotic doses on Table 2.1 that are administered via routes 1 or 2.

20. Check Antibiotic Administration Date
    a. If the Antibiotic Administration Date is equal to Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Antibiotic Administration Date is equal to a Non Unable to Determine date for at least one antibiotic dose, continue processing and proceed to the Antibiotic Days I calculation. Note: Proceed only with antibiotic doses that have an associated Non Unable to Determine date.

21. Calculate Antibiotic Days I. Antibiotic Days I, in days, is equal to the Surgical Incision Date minus the Antibiotic Administration Date.

22. Check Antibiotic Days I
    a. If the Antibiotic Days I is greater than 1 for at least one antibiotic dose, continue processing and recheck the ICD-9-CM Principal Procedure Code. Do not recheck step 25 Antibiotic Days I, step 26 Surgical Incision Time, step 27 Antibiotic Administration Time, or step 29 Antibiotic Timing I.
    b. If the Antibiotic Days I is less than or equal to 1 for all antibiotic doses, continue processing. Proceed to step 25 and recheck Antibiotics Days I. Do not recheck ICD-9-CM Principal Procedure Code or Oral Antibiotics.

23. Recheck ICD-9-CM Principal Procedure Code only if the Antibiotics Days was greater than 1 for at least one antibiotic dose
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and check Oral Antibiotics.

24. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

c. If Oral Antibiotics equals Yes, continue processing. Proceed to step 33 and check Anesthesia End Date. Do not recheck step 25 Antibiotic Days I, step 26 Surgical Incision Time, step 27 Antibiotic Administration Time, or step 29 Antibiotic Timing I.

25. Recheck Antibiotic Days I only if Antibiotic Days I is less than or equal to 1 for all antibiotic doses
    a. If the Antibiotic Days I is less than or equal to zero for all antibiotic doses, continue processing. Proceed to step 33 and check Anesthesia End Date. Do not check step 26 Surgical Incision Time, step 27 Antibiotic Administration Time, or step 29 Antibiotic Timing I.
    b. If the Antibiotic Days I is equal to 1 for ANY antibiotic dose, continue processing and proceed to Surgical Incision Time.

26. Check Surgical Incision Time
    a. If the Surgical Incision Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Surgical Incision Time is equal to Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If the Surgical Incision Time is equal to a Non Unable to Determine Value, continue processing and check Antibiotic Administration Time.

27. Check Antibiotic Administration Time
    a. If the Antibiotic Administration Time equals Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Antibiotic Administration Time equals a Non Unable to Determine time for at least one antibiotic dose, continue processing and recheck Antibiotic Administration Time.

28. Recheck Antibiotic Administration Time
    a. If the Antibiotic Administration Time equals Unable to Determine for ANY antibiotic dose with Antibiotic Days equal to 1, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

b. If the Antibiotic Administration Time equals a Non Unable to Determine time for All antibiotic doses with Antibiotic Days equal to 1, continue processing and proceed to the Antibiotic Timing I calculation.

29. Calculate Antibiotic Timing I. Antibiotic Timing I, in minutes, is equal to the Surgical Incision Date and Surgical Incision Time minus the Antibiotic Administration Date and Antibiotic Administration Time. Calculate Antibiotic Timing I for all antibiotic doses with Non Unable to Determine date and time. Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I less than or equal to zero.

30. Check Antibiotic Timing I
    a. If the Antibiotic Timing I is greater than 1440 minutes for any antibiotic dose, continue processing and recheck the ICD-9-CM Principal Procedure Code. Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I less than or equal to zero.
    b. If the Antibiotic Timing I is less than or equal to 1440 minutes for all antibiotic doses with non Unable to Determine date and time, continue processing and proceed to step 33 and check Anesthesia End Date. Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I less than or equal to zero. Do not recheck ICD-9-CM Principal Procedure Code or Oral Antibiotics.

31. Recheck ICD-9-CM Principal Procedure Code only if Antibiotic Timing I is greater than 1440 for any antibiotic dose

    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and check Oral Antibiotics.

32. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

c. If Oral Antibiotics equals Yes, continue processing and proceed to Anesthesia End Date.

33. Check Anesthesia End Date
    a. If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Anesthesia End 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 for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If the Anesthesia End Date equals a Non Unable to Determine Value, continue processing and proceed to the Antibiotic Days II calculation.

34. Calculate Antibiotic Days II. Antibiotic Days II, in days, is equal to the Antibiotic Administration Date minus the Anesthesia End Date.

35. Check Antibiotic Days II
    a. If the Antibiotic Days II is less than or equal to zero for all doses of all antibiotics, continue processing. Proceed to step 41 and recheck Antibiotic Administration Route. Do not check step 37 Anesthesia End Time, step 38 Antibiotic Administration Time, or step 39 Antibiotic Timing II.
    b. If the Antibiotic Days II is greater than zero for at least one dose of any antibiotic, continue processing and proceed to Initialize the Abxday flag.

36. Initialize Abxday flag. Initialize Abxday flag to equal 'No' for each antibiotic dose. Set Abxday flag to equal 'Yes' for each antibiotic dose where Antibiotic Days II is less than or equal to zero.

37. Check Anesthesia End Time
    a. If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Anesthesia End Time is equal to Unable to Determine, continue processing and proceed to check the Abxday flag.
        1. If the Abxday flag equals No for All doses, the case will proceed to a Measure Category Assignment of D of will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

2. If the Abxday flag equals Yes for ANY dose, continue processing and proceed to step 41. Proceed only with doses where the Abxflag is equal to Yes.

c. If the Anesthesia End Time is equal to a Non Unable to Determine Value, continue processing and recheck Antibiotic Administration Time.

38. Recheck Antibiotic Administration Time

a. If the Antibiotic Administration Time equals Unable to Determine for all antibiotic doses, continue processing and proceed to check the Abxday flag.

1. If the Abxday flag equals No for All doses, the case will proceed to a Measure Category Assignment of D of will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and recheck the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

2. If the Abxday flag equals Yes for ANY dose, continue processing and proceed to step 41 and recheck the Antibiotic Administration Route. Proceed only with doses where the Abxflag is equal to Yes. Do not check Antibiotic Timing II.

b. If the Antibiotic Administration Time equals a Non Unable to Determine time for at least one antibiotic dose, continue processing and proceed to the Antibiotic Timing II calculation. Proceed with both UTD and Non-UTD time.

39. Calculate Antibiotic Timing II. Antibiotic Timing II, in minutes, is equal to the Antibiotic Administration Date and Antibiotic Administration Time minus Anesthesia End Date and Anesthesia End Time. Calculate Antibiotic Timing II for all antibiotic doses with Non Unable to Determine date and time. Proceed with antibiotic doses that have Antibiotic Timing II calculated, or Abxday flag equal to Yes.

40. Check Antibiotic Timing II

a. If the Antibiotic Timing II is greater than 1440 minutes for all doses of all Antibiotics with a Non Unable to Determine date and time, continue processing and proceed to check the Abxday Flag. Proceed with antibiotic doses that have Antibiotic Timing II calculated, or Abxday flag equal to Yes.

1. If the Abxday flag equals No for All doses, the case will proceed to a Measure Category Assignment of B of will not be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

2. If the Abxday flag equals Yes for ANY dose, continue processing and recheck the Antibiotic Administration Route. Proceed only with doses where the Abxflag is equal to Yes.

b. If the Antibiotic Timing II is less than or equal to 1440 minutes for at least one dose of ANY antibiotic, continue processing and proceed to Antibiotic Administration Route. Proceed with antibiotic doses that have Antibiotic Timing II calculated, or Abxday flag equal to Yes.

41. Recheck Antibiotic Administration Route. For each case, proceed ONLY with those antibiotic doses that satisfy at least one of the following conditions: Antibiotic Timing II is less than or equal to 1440 or Abxday flag is equal to Yes.

a. If the Antibiotic Administration Route equals 1 for all doses of all Antibiotics, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

b. If the Antibiotic Administration Route equals 2 for any dose of any antibiotic, continue processing and proceed to recheck the ICD-9-CM Principal Procedure Code. Note: For each case include only those antibiotics with route IV for further processing.

42. Recheck ICD-9-CM Principal Procedure Code

a. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and proceed to step 46 and recheck Antibiotic Name. Do not recheck to determine if ICD-9-CM Principal Procedure Code is on Tables 5.01, 5.02, 5.04, 5.05, 5.06, 5.07, or 5.08 or if Antibiotic Name is on Table 3.2.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.01, 5.02, 5.04, 5.05, 5.06, 5.07, or 5.08, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code.

43. Recheck ICD-9-CM Principal Procedure Code

a. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07, continue processing and proceed to recheck Antibiotic Name.

1. If the Antibiotic Name is on Table 3.7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

2. If the Antibiotic Name is not on Table 3.7, continue processing and proceed to step 46 and recheck Antibiotic Name. Do not recheck to determine if ICD-9-CM Principal Procedure Code is on Tables 5.01, 5.02, 5.04, 5.05, or 5.08 or if Antibiotic Name is on Table 3.2.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.01, 5.02, 5.04, 5.05, or 5.08, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code.

44. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.01, 5.02, or 5.08, continue processing and proceed to recheck Antibiotic Name.
        1. If the Antibiotic Name is on Table 3.1, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
        2. If the Antibiotic Name is not on Table 3.1, continue processing and proceed to step 46 and recheck Antibiotic Name. Do not recheck to determine if ICD-9-CM Principal Procedure Code is on Tables 5.04 or 5.05 or if Antibiotic Name is on Table 3.2.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.04 or 5.05, continue processing and proceed to recheck Antibiotic Name.

45. Recheck Antibiotic Name
    a. If the Antibiotic Name is on Table 3.2, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Antibiotic Name is not on Table 3.2, continue processing and proceed to recheck Antibiotic Name.

46. Recheck Antibiotic Name
    a. If the Antibiotic Name is on Table 3.6b, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Antibiotic Name is not on Table 3.6b, continue processing and proceed to recheck Antibiotic Name.

47. Recheck Antibiotic Name
    a. If the Antibiotic Name is on Table 3.5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If the Antibiotic Name is not on Table 3.5, continue processing and proceed to recheck Antibiotic Name.

48. Recheck Antibiotic Name
    a. If the Antibiotic Name is on Table 3.2, continue processing and recheck Antibiotic Name.
        1. If the Antibiotic Name is on Table 3.6a, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
        2. If the Antibiotic name is not on Table 3.6a, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code.
    b. If the Antibiotic Name is not on Table 3.2, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code.

49. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.01, 5.02, 5.04, 5.05, or 5.08, continue processing and proceed to recheck Antibiotic Name.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.03, 5.06 or 5.07, continue processing and proceed to step 54 and check Antibiotic Allergy, Do not check step 50 and 52 to see if Antibiotic Name is on Tables 3.8 or 3.9, step 51 Antibiotic Allergy or step 53 Vancomycin.

50. Recheck Antibiotic Name only if the ICD-9-CM Principal Procedure Code is on Table 5.01, 5.02, 5.04, 5.05, or 5.08
    a. If none of the Antibiotic Names are on Table 3.8 and 3.9, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If at least one of the Antibiotic Names are on Table 3.8 or 3.9, continue processing and proceed to Antibiotic Allergy.

51. Check Antibiotic Allergy only if at least one of the Antibiotic Names are on Table 3.8 or 3.9
    a. If Antibiotic Allergy is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Antibiotic Allergy equals Yes, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If Antibiotic Allergy equals No, continue processing and proceed to recheck Antibiotic Name.

52. Recheck Antibiotic Name
    a. If none of the Antibiotic Names are on Table 3.8, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If at least one of the Antibiotic Names are on Table 3.8, continue processing and proceed to check Vancomycin.

53. Check Vancomycin
    a. If Vancomycin is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If any Vancomycin value equals 9 and none of the values equal 1, 2, 3, 4, 5, 6, 7, 8, 10, or 11, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If any Vancomycin value equals 1, 2, 3, 4, 5, 6, 7, 8, 10, or 11 and none of the values equals 9, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

54. Check Antibiotic Allergy only if the ICD-9-CM Principal Procedure Code is on Table 5.03, 5.06, or 5.07

    a. If Antibiotic Allergy is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    b. If Antibiotic Allergy equals No, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
    c. If Antibiotic Allergy equals Yes, continue processing and proceed to recheck Antibiotic Name.

55. Recheck Antibiotic Name
    a. If at least one of the Antibiotic Names is on Table 3.9, continue processing and recheck Antibiotic Name.

1. If at least one of the Antibiotic Names is on Tables 2.11 or 3.12 or 2.7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 57 and check the Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
2. If none of the Antibiotic Names are on Tables 2.11 or 3.12 or 2.7, continue processing and recheck Antibiotic Name.

b. If none of the Antibiotic Names are on Table 3.9, continue processing and recheck Antibiotic Name.

56. Recheck Antibiotic Name

a. If at least one of the Antibiotic Names is on Table 3.6a, continue processing and recheck Antibiotic Name.
   1. If at least one of the Antibiotic Names is on Tables 2.11 or 3.12, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.
   2. If none of the Antibiotic Names are on Tables 2.11 or 3.12, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

b. If none of the Antibiotic Names are on Table 3.6a, the case will proceed to a Measure Category Assignment of D and will be in the measure population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-2a) for The Joint Commission.

57. For The Joint Commission Only, continue processing for the Stratified Measures. Note: Initialize the Measure Category Assignment for each strata measure (b-g) to equal B, not in the Measure Population. Do not change the Measure Category Assignment that was already calculated for the overall rate (SCIP-Inf-2a). The rest of the algorithm will reset the appropriate Measure Category Assignment to be equal to the overall rate's (SCIP-Inf-2a) Measure Category Assignment.

58. Check Overall Rate Category Assignment

a. If the Overall Rate Category Assignment is equal to B or X, set the Measure Category Assignment for the strata measures (SCIP-Inf-2b through SCIP-Inf-2h) to equal B, not in the Measure Population. Stop processing.

b. If the Overall Rate Category Assignment is equal to D or E, continue processing and check the ICD-9-CM Principal Procedure Code.

59. Check ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.01, for Stratified Measure SCIP-Inf-2b, set the Measure Category Assignment for measure SCIP-Inf-2b to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

60. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.02, for Stratified Measure SCIP-Inf-2c, set the Measure Category Assignment for measure SCIP-Inf-2c to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

61. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.04, for Stratified Measure SCIP-Inf-2d, set the Measure Category Assignment for measure SCIP-Inf-2d to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

62. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.05, for Stratified Measure SCIP-Inf-2e, set the Measure Category Assignment for measure SCIP-Inf-2e to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

63. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.03, for Stratified Measure SCIP-Inf-2f, set the Measure Category Assignment for measure SCIP-Inf-2f to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

64. Recheck ICD-9-CM Principal Procedure Code

a. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07, for Stratified Measure SCIP-Inf-2g, set the Measure Category Assignment for measure SCIP-Inf-2g to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.08, for Stratified Measure SCIP-Inf-2h, set the Measure Category Assignment for measure SCIP-Inf-2h to equal the Measure Category Assignment for measure SCIP-Inf-2a. Stop processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID #: SCIP-Inf-3

Set Measure ID #	Performance Measure Name
SCIP-Inf-3a	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Overall Rate
SCIP-Inf-3b	Prophylactic Antibiotics Discontinued Within 48 Hours After Surgery End Time - CABG
SCIP-Inf-3c	Prophylactic Antibiotics Discontinued Within 48 Hours After Surgery End Time - Other Cardiac Surgery
SCIP-Inf-3d	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Hip Arthroplasty
SCIP-Inf-3e	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Knee Arthroplasty
SCIP-Inf-3f	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Colon Surgery
SCIP-Inf-3g	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Hysterectomy
SCIP-Inf-3h	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time - Vascular Surgery

Performance Measure Name: Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time

Description: Surgical patients whose prophylactic antibiotics were discontinued within 24 hours after *Anesthesia End Time*. The Society of Thoracic Surgeons (STS) Practice Guideline for Antibiotic Prophylaxis in Cardiac Surgery (2006) indicates that there is no reason to extend antibiotics beyond 48 hours for cardiac surgery and very explicitly states that antibiotics should not be extended beyond 48 hours even with tubes and drains in place for cardiac surgery.

Rationale: A goal of prophylaxis with antibiotics is to provide benefit to the patient with as little risk as possible. It is important to maintain therapeutic serum and tissue levels throughout the operation. Intraoperative re-dosing may be needed for long operations. However, administration of antibiotics for more than a few hours after the incision is closed offers no additional benefit to the surgical patient. Prolonged administration does

increase the risk of Clostridium difficile infection and the development of antimicrobial resistant pathogens.

Type of Measure: Process

Improvement Noted As: An increase in the rate.

Numerator Statement: Number of surgical patients whose prophylactic antibiotics were discontinued within 24 hours after *Anesthesia End Time* (48 hours for CABG or Other Cardiac Surgery).

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:
- *Anesthesia End Date*
- *Anesthesia End Time*
- *Antibiotic Administration Date*
- *Antibiotic Administration Time*

Denominator Statement: All selected surgical patients with no evidence of prior infection.

Included Populations:
- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes)

AND

- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.01-5.08 for ICD-9-CM codes)

Excluded Populations:
- Patients less than 18 years of age
- Patients who have a length of Stay greater than 120 days
- Patients who had a principal diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 5.09 for ICD-9-CM codes)
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients who expired perioperatively

- Patients who had other procedures requiring general or spinal anesthesia that occurred within three days (four days for CABG or Other Cardiac Surgery) prior to or after the procedure of interest (during separate surgical episodes) during this hospital stay
- Patients who were receiving antibiotics more than 24 hours prior to surgery (except colon surgery patients taking oral prophylactic antibiotics)
- Patients who were receiving antibiotics within 24 hours prior to arrival (except colon surgery patients taking oral prophylactic antibiotics)
- Patients who did not receive any antibiotics during this hospitalization.
- Patients who received urinary antiseptics only (as defined in Appendix C, Table 3.11)
- Patients with *Reasons to Extend Antibiotics.*

Data Elements:

- *Admission Date*
- *Anesthesia Start Date*
- *Antibiotic Administration Route*
- *Antibiotic Name*
- *Antibiotic Received*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Infection Prior to Anesthesia*
- *Laparoscope*
- *Oral Antibiotics*
- *Other Surgeries*
- *Perioperative Death*
- *Reasons to Extend Antibiotics*
- *Surgical Incision Date*
- *Surgical Incision Time*

Risk Adjustment: No

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

Data Accuracy: Abstracted antibiotics are those administered from the time of arrival through the first 48 hours (72 hours for CABG or Other Cardiac Surgery) after the *Anesthesia End Time.* Refer to Appendix C, Table 2.1, which contains a complete listing of antibiotics.

Measure Analysis Suggestions: Consideration may be given to relating this measure to SCIP-Inf-1 and SCIP-Inf-2 in order to evaluate to which aspects of antibiotic

prophylaxis would most benefit from an improvement effort. The process-owners of the timing of discontinuation of antibiotics subsequent to surgery include physicians/APNs/PAs, the post-surgical recovery team, as well as the postoperative nursing unit. By including the appropriate groups involved in the postoperative care process, one can more clearly ascertain where in the process the team may need to focus for improvement.

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: Overall aggregate rate for all surgeries and stratified rates by data element *ICD-9-CM Principal Procedure Code*, generated from count data reported as a proportion.

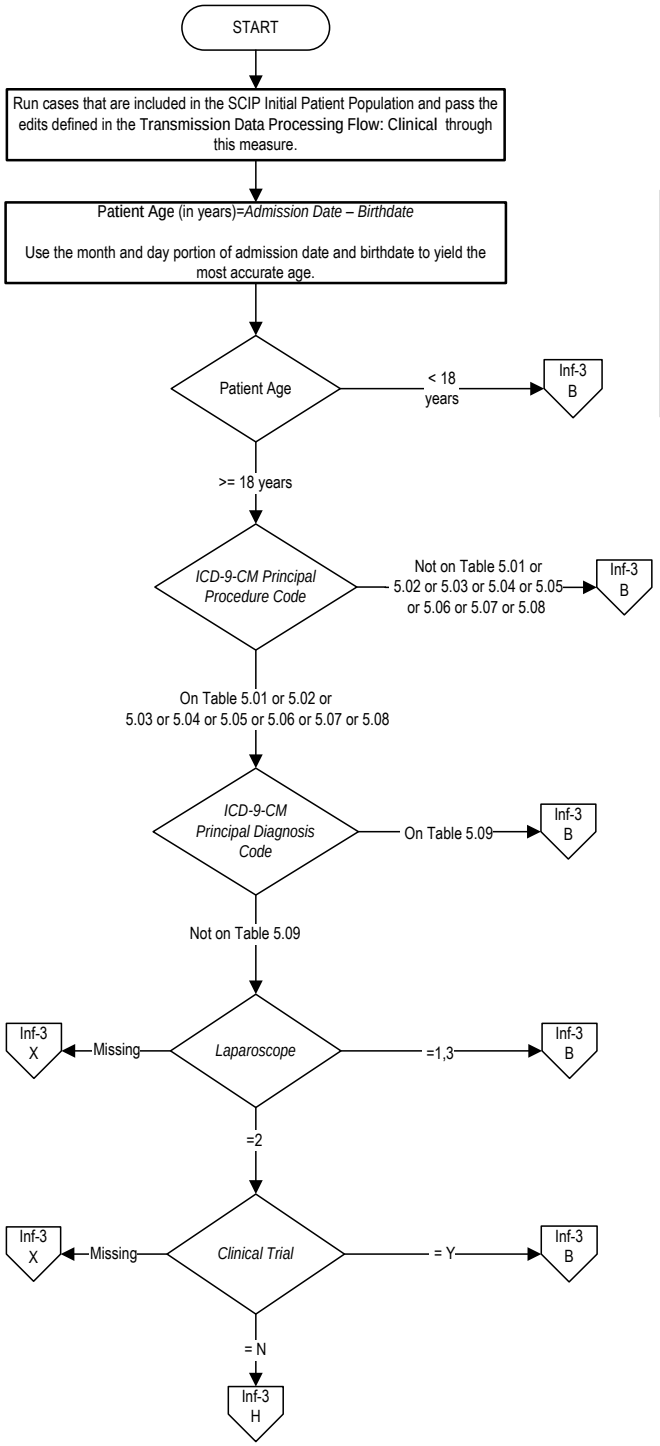
Selected References:

- Bratzler DW, Houck PM, for the Surgical Infection Prevention Guidelines Writers Group. Antimicrobial prophylaxis for surgery: An advisory statement from the National Surgical Infection Prevention Project. *CID*. 2004:38(15 June):1706-1715.
- Crabtree TD, Pelletier SJ, Gleason TG, et al. Clinical characteristics and antibiotic utilization in surgical patients with *Clostridium difficile*-associated diarrhea. *Am Surg.* 1999;65:507-511.
- Edwards FH, Engelman RM, Houck P, Shahian DM, Bridges CR. The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic prophylaxis in cardiac surgery, Part I: Duration, 2006. *Ann Thoracic Surg* 2006; 81: 397-404.
- Mangram AJ, Horan TC, Pearson ML, et al. Guidelines for prevention of surgical site infection, 1999. *Infect Control Hosp Epidemiol.* 1999;20:247-280.
- McDonald M, Grabsch E, Marshall C, et al. Single- versus multiple-dose antimicrobial prophylaxis for major surgery: a systemic review. *Aust N Z J Surg.* 1988;68:388-396.
- Scher KS. Studies on the duration of antibiotic administration for surgical prophylaxis. *Am Surg.* 1997;63:59-62.

SCIP-Inf-3: Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time

Numerator: Number of surgical patients whose prophylactic antibiotics were discontinued within 24 hours after *Anesthesia End Time* (48 hours for CABG or Other Cardiac Surgery).

Denominator: All selected surgical patients with no evidence of prior infection.

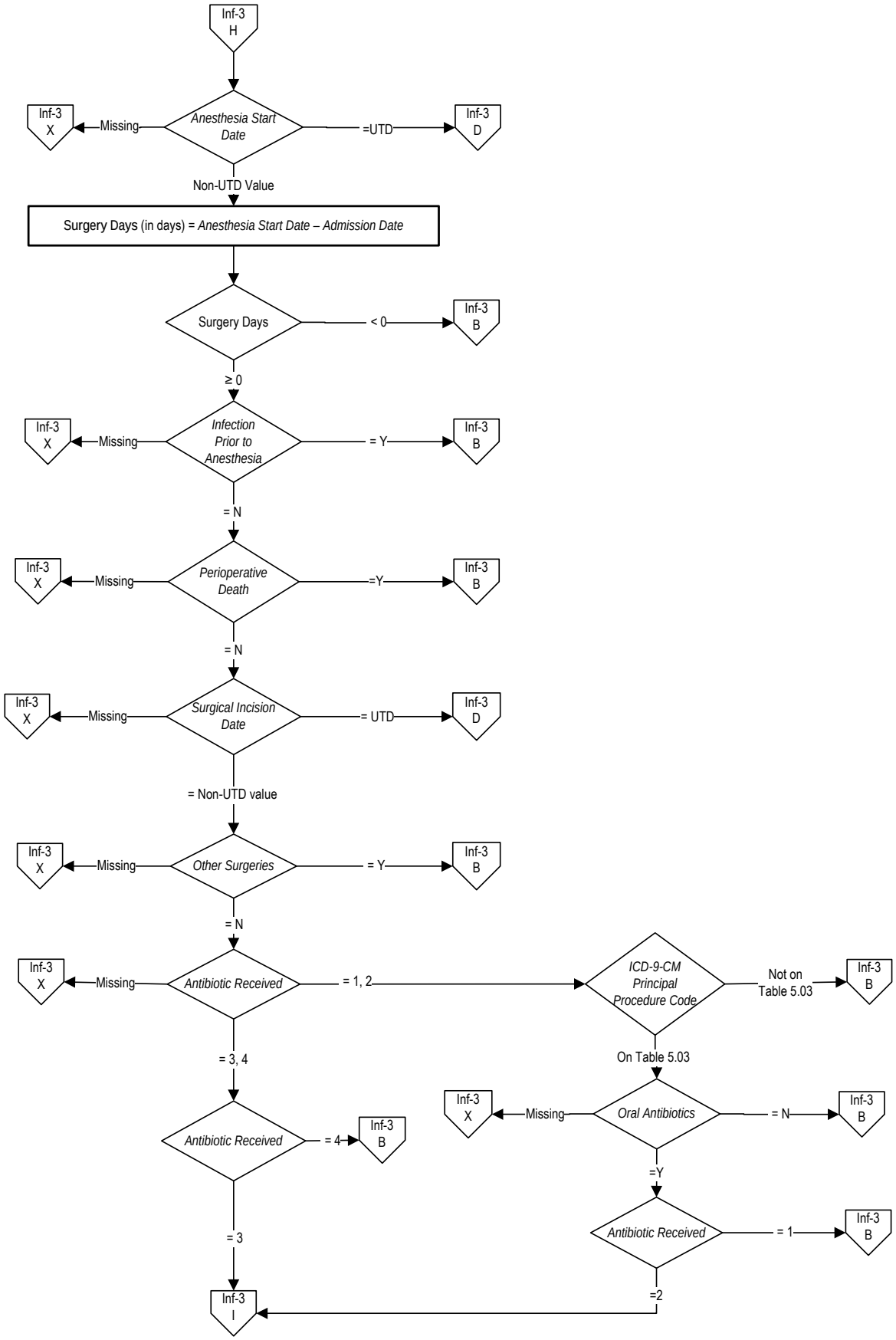


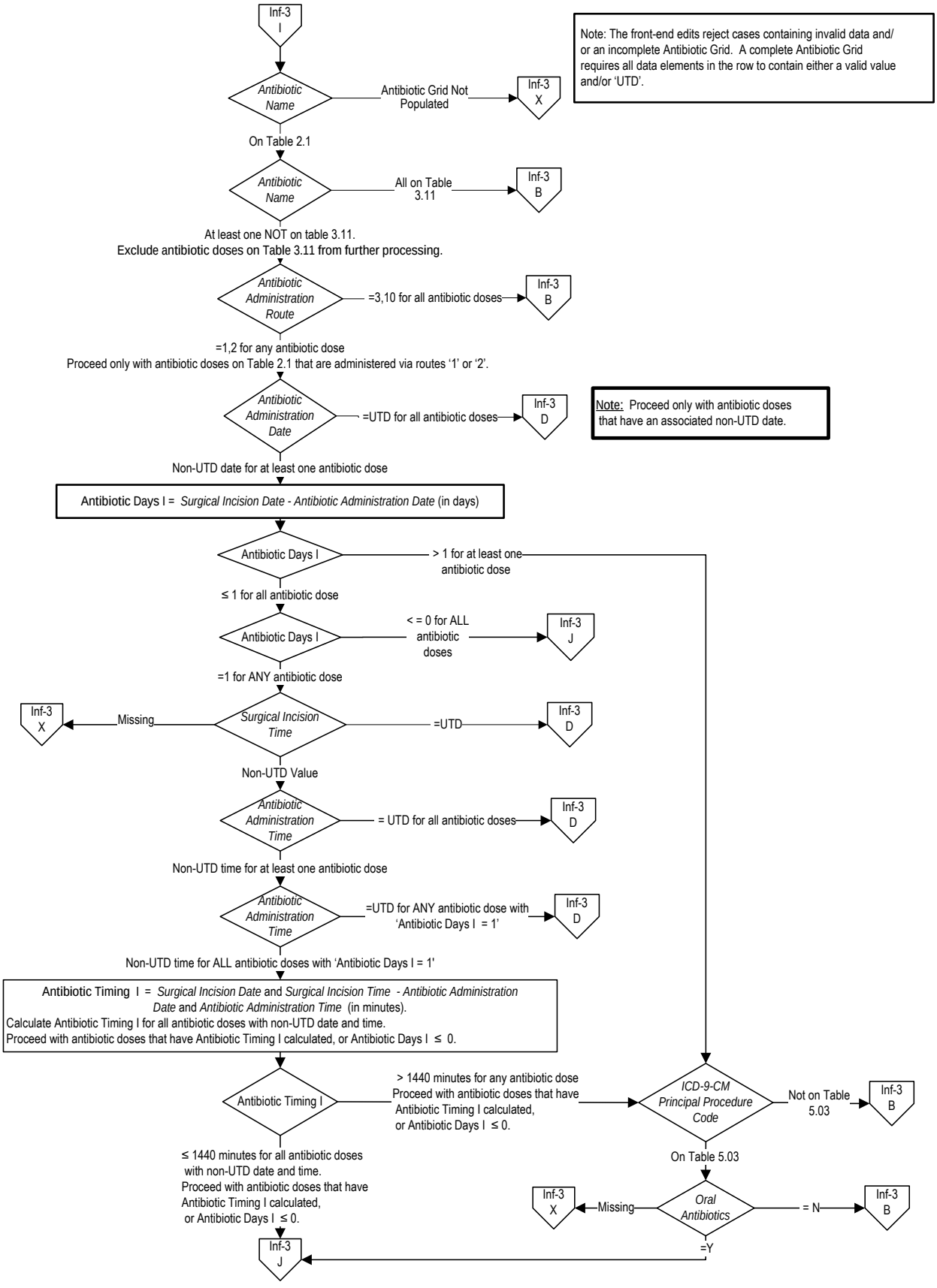
Variable Key:
Patient Age
Antibiotic Days I
Antibiotic Days II
Antibiotic Timing I
Antibiotic Timing II
Surgery Days
Exclusion Flag

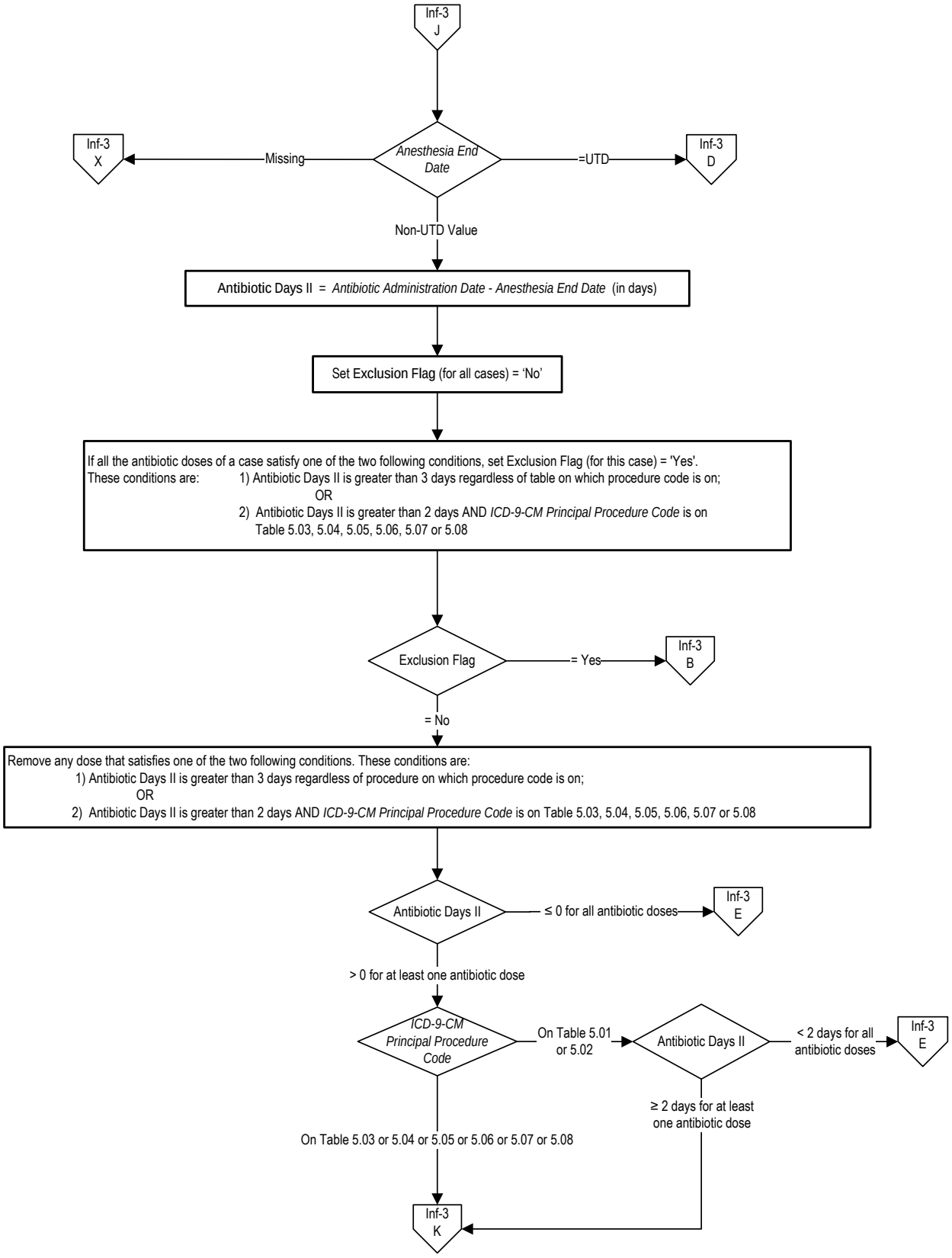
Stratification Table:

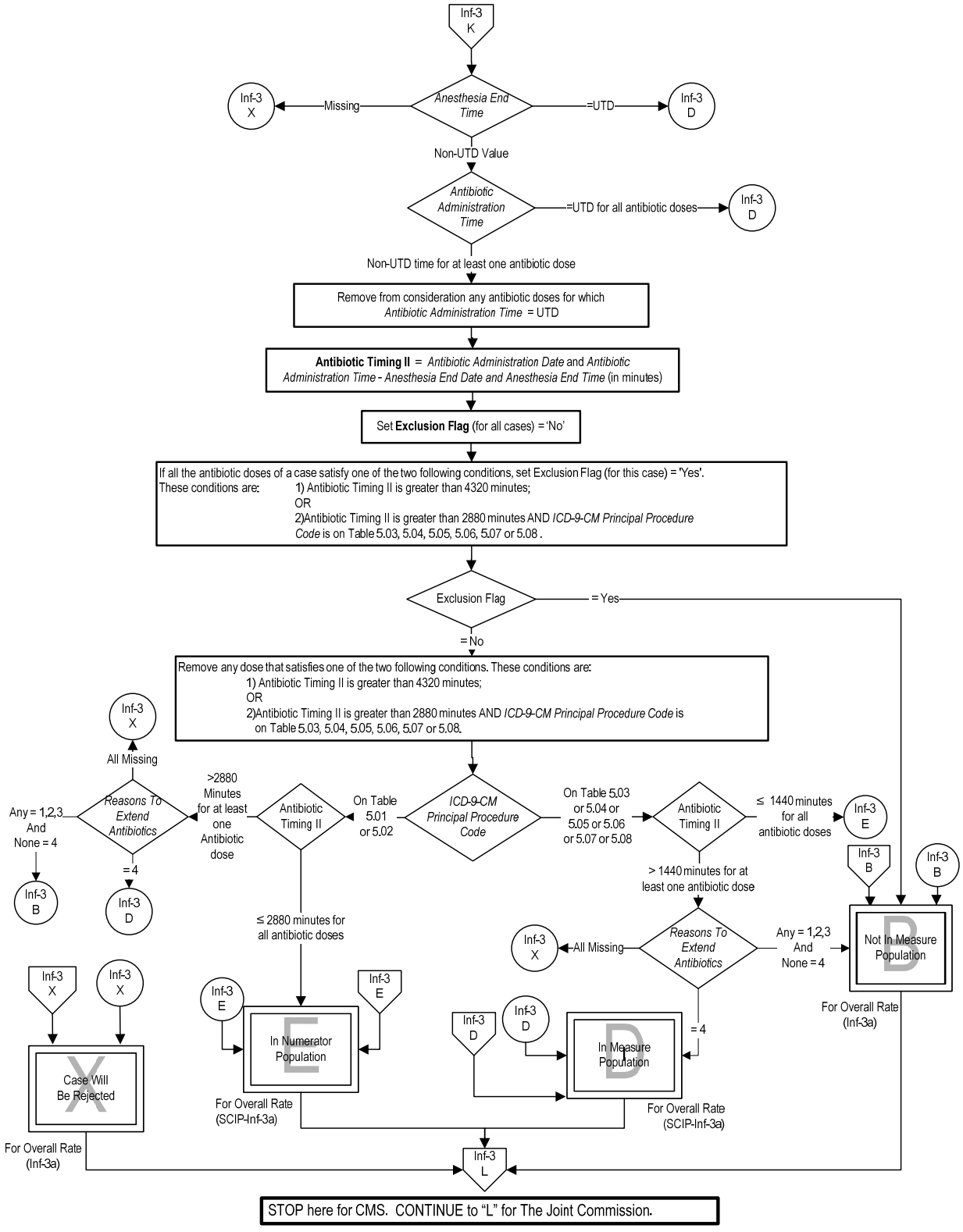
Set#	Stratified By	*Principal Procedure Code (Allowable Value)
SCIP-Inf3a	Overall Rate	**
SCIP-Inf3b	CABG	Table 5.01
SCIP-Inf3c	Other Cardiac Surgery	Table 5.02
SCIP-Inf3d	Hip Arthroplasty	Table 5.04
SCIP-Inf3e	Knee Arthroplasty	Table 5.05
SCIP-Inf3f	Colon Surgery	Table 5.03
SCIP-Inf3g	Hysterectomy	Table 5.06 Or 5.07
SCIP-Inf3h	Vascular Surgery	Table 5.08

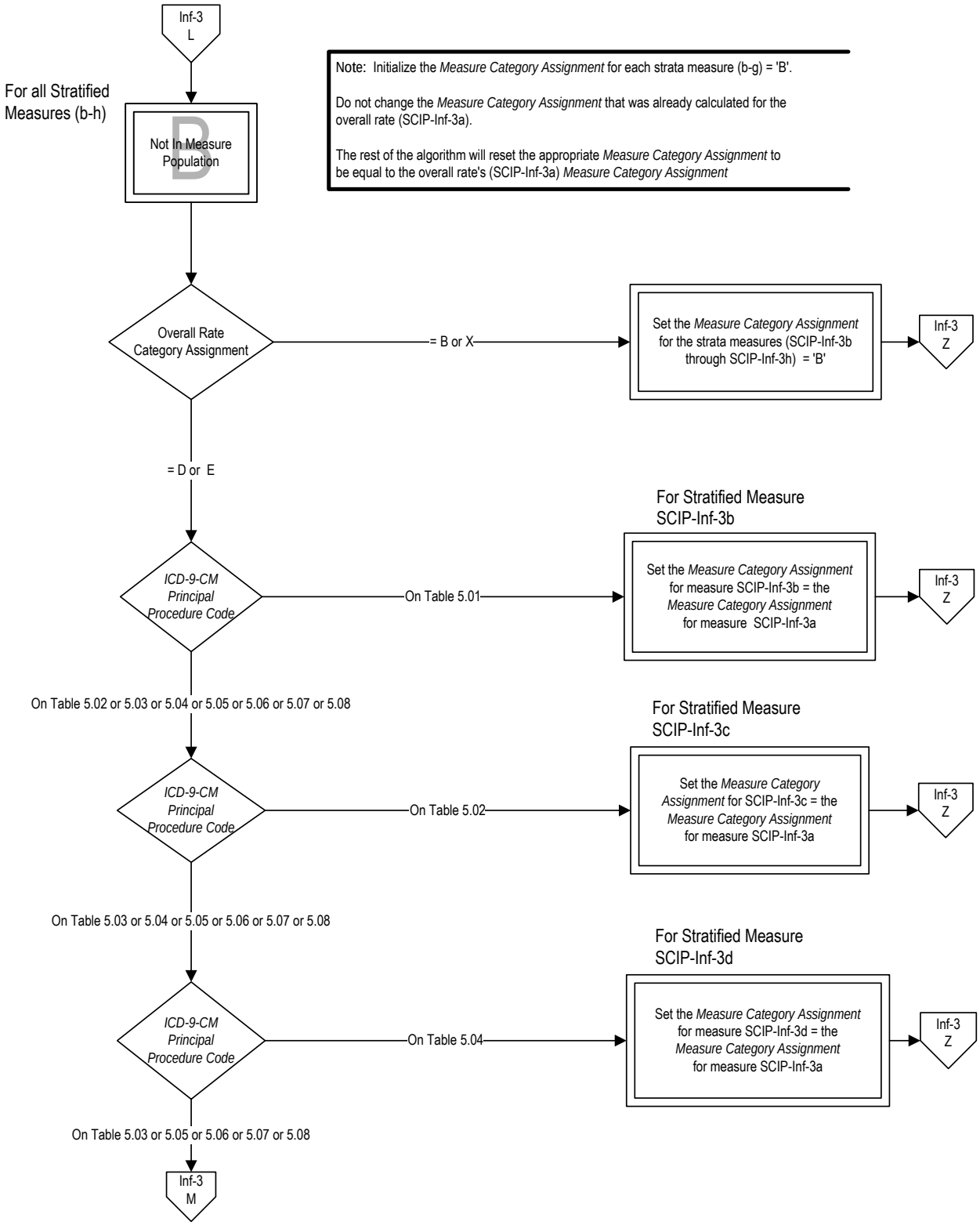
* This refers to the data element *'ICD-9-CM Principal Procedure Code'*. Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.
** No allowable value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.

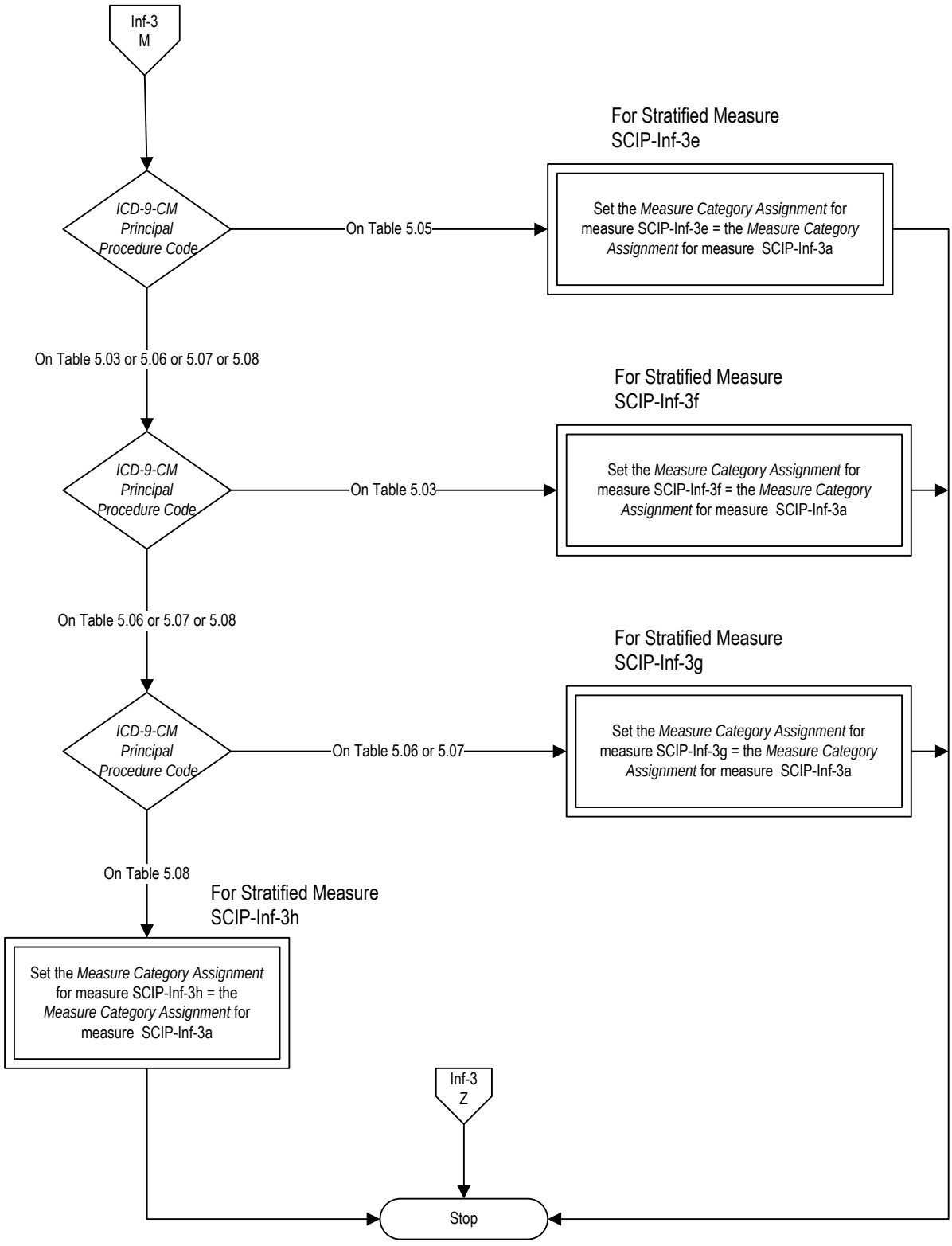

Inf-3 H
Anesthesia Start Date
Missing
Inf-3 X
=UTD
Inf-3 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
Inf-3 B
≥ 0
Infection Prior to Anesthesia
Missing
Inf-3 X
= Y
Inf-3 B
= N
Perioperative Death
Missing
Inf-3 X
=Y
Inf-3 B
= N
Surgical Incision Date
Missing
Inf-3 X
= UTD
Inf-3 D
= Non-UTD value
Other Surgeries
Missing
Inf-3 X
= Y
Inf-3 B
= N
Antibiotic Received
Missing
Inf-3 X
= 1, 2
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-3 B
On Table 5.03
= 3, 4
Antibiotic Received
= 4
Inf-3 B
= 3
Oral Antibiotics
Missing
Inf-3 X
= N
Inf-3 B
=Y
Antibiotic Received
= 1
Inf-3 B
=2
Inf-3 I


Inf-3 I
Antibiotic Name
Antibiotic Grid Not Populated
Inf-3 X
Note: The front-end edits reject cases containing invalid data and/ or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or 'UTD'.
On Table 2.1
Antibiotic Name
All on Table 3.11
Inf-3 B
At least one NOT on table 3.11.
Exclude antibiotic doses on Table 3.11 from further processing.
Antibiotic Administration Route
=3,10 for all antibiotic doses
Inf-3 B
=1,2 for any antibiotic dose
Proceed only with antibiotic doses on Table 2.1 that are administered via routes '1' or '2'.
Antibiotic Administration Date
=UTD for all antibiotic doses
Inf-3 D
Note: Proceed only with antibiotic doses that have an associated non-UTD date.
Non-UTD date for at least one antibiotic dose
Antibiotic Days I = Surgical Incision Date - Antibiotic Administration Date (in days)
Antibiotic Days I
> 1 for at least one antibiotic dose
≤ 1 for all antibiotic dose
Antibiotic Days I
< = 0 for ALL antibiotic doses
Inf-3 J
=1 for ANY antibiotic dose
Inf-3 X
Missing
Surgical Incision Time
=UTD
Inf-3 D
Non-UTD Value
Antibiotic Administration Time
= UTD for all antibiotic doses
Inf-3 D
Non-UTD time for at least one antibiotic dose
Antibiotic Administration Time
=UTD for ANY antibiotic dose with 'Antibiotic Days I = 1'
Inf-3 D
Non-UTD time for ALL antibiotic doses with 'Antibiotic Days I = 1'
Antibiotic Timing I = Surgical Incision Date and Surgical Incision Time - Antibiotic Administration Date and Antibiotic Administration Time (in minutes).
Calculate Antibiotic Timing I for all antibiotic doses with non-UTD date and time.
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.
Antibiotic Timing I
> 1440 minutes for any antibiotic dose
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.
ICD-9-CM Principal Procedure Code
Not on Table 5.03
Inf-3 B
On Table 5.03
≤ 1440 minutes for all antibiotic doses with non-UTD date and time.
Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I ≤ 0.
Inf-3 X
Missing
Oral Antibiotics
= N
Inf-3 B
=Y
Inf-3 J


Inf-3 J
Anesthesia End Date
Missing
Inf-3 X
=UTD
Inf-3 D
Non-UTD Value
Antibiotic Days II = Antibiotic Administration Date - Anesthesia End Date (in days)
Set Exclusion Flag (for all cases) = 'No'
If all the antibiotic doses of a case satisfy one of the two following conditions, set Exclusion Flag (for this case) = 'Yes'.
These conditions are: 1) Antibiotic Days II is greater than 3 days regardless of table on which procedure code is on;
OR
2) Antibiotic Days II is greater than 2 days AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07 or 5.08
Exclusion Flag
= Yes
Inf-3 B
= No
Remove any dose that satisfies one of the two following conditions. These conditions are:
1) Antibiotic Days II is greater than 3 days regardless of procedure on which procedure code is on;
OR
2) Antibiotic Days II is greater than 2 days AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07 or 5.08
Antibiotic Days II
≤ 0 for all antibiotic doses
Inf-3 E
> 0 for at least one antibiotic dose
ICD-9-CM Principal Procedure Code
On Table 5.01 or 5.02
Antibiotic Days II
< 2 days for all antibiotic doses
Inf-3 E
≥ 2 days for at least one antibiotic dose
On Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
Inf-3 K


Inf-3 K
Anesthesia End Time
Missing
Inf-3 X
=UTD
Inf-3 D
Non-UTD Value
Antibiotic Administration Time
=UTD for all antibiotic doses
Inf-3 D
Non-UTD time for at least one antibiotic dose
Remove from consideration any antibiotic doses for which Antibiotic Administration Time = UTD
Antibiotic Timing II = Antibiotic Administration Date and Antibiotic Administration Time - Anesthesia End Date and Anesthesia End Time (in minutes)
Set Exclusion Flag (for all cases) = 'No'
If all the antibiotic doses of a case satisfy one of the two following conditions, set Exclusion Flag (for this case) = 'Yes'.
These conditions are: 1) Antibiotic Timing II is greater than 4320 minutes;
OR
2)Antibiotic Timing II is greater than 2880 minutes AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07 or 5.08 .
Exclusion Flag
= Yes
= No
Remove any dose that satisfies one of the two following conditions. These conditions are:
1) Antibiotic Timing II is greater than 4320 minutes;
OR
2)Antibiotic Timing II is greater than 2880 minutes AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07 or 5.08.
Inf-3 X
All Missing
Reasons To Extend Antibiotics
Any = 1,2,3 And None = 4
Inf-3 B
= 4
Inf-3 D
>2880 Minutes for at least one Antibiotic dose
Antibiotic Timing II
≤ 2880 minutes for all antibiotic doses
On Table 5.01 or 5.02
ICD-9-CM Principal Procedure Code
On Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
Antibiotic Timing II
≤ 1440 minutes for all antibiotic doses
Inf-3 E
> 1440 minutes for at least one antibiotic dose
Inf-3 B
Inf-3 B
Reasons To Extend Antibiotics
Inf-3 X
All Missing
Any = 1,2,3 And None = 4
Not In Measure Population
D
For Overall Rate (Inf-3a)
= 4
Inf-3 X
Inf-3 X
Case Will Be Rejected
X
For Overall Rate (Inf-3a)
Inf-3 E
Inf-3 E
In Numerator Population
E
For Overall Rate (SCIP-Inf-3a)
Inf-3 D
Inf-3 D
In Measure Population
D
For Overall Rate (SCIP-Inf-3a)
Inf-3 L
STOP here for CMS. CONTINUE to "L" for The Joint Commission.


Inf-3 L
For all Stratified Measures (b-h)
Not In Measure Population
B
Note: Initialize the Measure Category Assignment for each strata measure (b-g) = 'B'.
Do not change the Measure Category Assignment that was already calculated for the overall rate (SCIP-Inf-3a).
The rest of the algorithm will reset the appropriate Measure Category Assignment to be equal to the overall rate's (SCIP-Inf-3a) Measure Category Assignment
Overall Rate Category Assignment
= B or X
Set the Measure Category Assignment for the strata measures (SCIP-Inf-3b through SCIP-Inf-3h) = 'B'
Inf-3 Z
= D or E
For Stratified Measure SCIP-Inf-3b
ICD-9-CM Principal Procedure Code
On Table 5.01
Set the Measure Category Assignment for measure SCIP-Inf-3b = the Measure Category Assignment for measure SCIP-Inf-3a
Inf-3 Z
On Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
For Stratified Measure SCIP-Inf-3c
ICD-9-CM Principal Procedure Code
On Table 5.02
Set the Measure Category Assignment for SCIP-Inf-3c = the Measure Category Assignment for measure SCIP-Inf-3a
Inf-3 Z
On Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08
For Stratified Measure SCIP-Inf-3d
ICD-9-CM Principal Procedure Code
On Table 5.04
Set the Measure Category Assignment for measure SCIP-Inf-3d = the Measure Category Assignment for measure SCIP-Inf-3a
Inf-3 Z
On Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08
Inf-3 M


Inf-3
M
ICD-9-CM
Principal
Procedure Code
On Table 5.05
For Stratified Measure
SCIP-Inf-3e
Set the Measure Category Assignment for measure SCIP-Inf-3e = the Measure Category Assignment for measure SCIP-Inf-3a
On Table 5.03 or 5.06 or 5.07 or 5.08
ICD-9-CM
Principal
Procedure Code
On Table 5.03
For Stratified Measure
SCIP-Inf-3f
Set the Measure Category Assignment for measure SCIP-Inf-3f = the Measure Category Assignment for measure SCIP-Inf-3a
On Table 5.06 or 5.07 or 5.08
ICD-9-CM
Principal
Procedure Code
On Table 5.06 or 5.07
For Stratified Measure
SCIP-Inf-3g
Set the Measure Category Assignment for measure SCIP-Inf-3g = the Measure Category Assignment for measure SCIP-Inf-3a
On Table 5.08
For Stratified Measure
SCIP-Inf-3h
Set the Measure Category Assignment for measure SCIP-Inf-3h = the Measure Category Assignment for measure SCIP-Inf-3a
Inf-3
Z
Stop

SCIP-Infection (Inf)-3: Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time

Numerator: Number of surgical patients whose prophylactic antibiotics were discontinued within 24 hours after Anesthesia End Time (48 hours for Coronary Artery Bypass Graft [CABG] or Other Cardiac Surgery).

Denominator: All selected surgical patients with no evidence of prior infection.

Variable Key: Patient Age, Antibiotic Days I, Antibiotic Days II, Antibiotic Timing I, Antibiotic Timing II, Surgery Days, Exclusion Flag

Stratification Table

The Stratification Table includes the Set Number, Stratified By, and the Principal Procedure Code (Allowable Value). The Principal Procedure Code refers to the data element ICD-9-CM Principal Procedure Code. Each case will be stratified according to the principal procedure code, after the Category Assignments are completed and the overall rate is calculated.

Set Number	Stratified By the Overall Rate	Principal Procedure Code
SCIP-Inf 3a	Overall Rate	No allowable Value exists for the overall rate. It includes all procedures on Tables 5.01 to 5.08.
SCIP-Inf 3b	Coronary Artery Bypass Graft (CABG)	Table 5.01
SCIP-Inf 3c	Other Cardiac Surgery	Table 5.02
SCIP-Inf 3d	Hip Arthroplasty	Table 5.04
SCIP-Inf 3e	Knee Arthroplasty	Table 5.05
SCIP-Inf 3f	Colon Surgery	Table 5.03
SCIP-Inf 3g	Hysterectomy	Table 5.06 or Table 5.07
SCIP-Inf 3h	Vascular Surgery	Table 5.08

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for Centers for Medicare and Medicaid Services (CMS). Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is not on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   b. If the ICD-9-CM Principal Procedure Code is on Table 5.01 or 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and proceed to recheck ICD-9-CM Principal Diagnosis Code.

5. Check ICD-9-CM Principal Diagnosis Code
   a. If the ICD-9-CM Principal Diagnosis Code is on Table 5.09, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   b. If the ICD-9-CM Principal Diagnosis Code is not on Table 5.09, continue processing and proceed to Laparoscope.

6. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   b. If Laparoscope equals 1 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   c. If Laparoscope equals 2, continue processing and proceed to Clinical Trial.

7. 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 for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   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 for CMS. Proceed to step 47 and check the Stratified

Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

c. If Clinical Trial equals No, continue processing and proceed to Anesthesia Start Date.

8. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   b. If the Anesthesia Start 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 for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   c. If Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

9. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

10. Check Surgery Days
   a. If the Surgery Days is less than zero, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   b. If the Surgery Days is greater than or equal to zero, continue processing and proceed to Infection Prior to Anesthesia.

11. Check Infection Prior to Anesthesia
   a. If Infection Prior to Anesthesia is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   b. If Infection Prior to Anesthesia equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
   c. If Infection Prior to Anesthesia equals No, continue processing and proceed to Perioperative Death.

12. Check Perioperative Death
    a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If Perioperative Death equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If Perioperative Death equals No, continue processing and proceed to Surgical Incision Date.

13. Check Surgical Incision Date
    a. If the Surgical Incision Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP- Inf-3a) for The Joint Commission.
    b. If the Surgical Incision 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 for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If Surgical Incision Date equals a Non Unable To Determine Value, continue processing and proceed to Other Surgeries.

14. Check Other Surgeries
    a. If Other Surgeries is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If Other Surgeries equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If Other Surgeries equals No, continue processing and proceed to Antibiotic Received.

15. Check Antibiotic Received
    a. If Antibiotic Received equals 1 or 2, continue processing and proceed to recheck ICD-9-CM Principal Procedure Code
    b. If Antibiotic Received equals 4, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing

for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

c. If Antibiotic Received equals 3, continue processing and proceed to step 19 and check Antibiotic Name. Do not check step 16 ICD-9-CM Principal Procedure Code, step 17 Oral Antibiotics or step 18 Antibiotic Received.

16. Recheck ICD-9-CM Principal Procedure Code only if Antibiotic Received equals 1 or 2
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the measure population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and proceed to check Oral Antibiotics.

17. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If Oral Antibiotics equals Yes, continue processing and proceed to recheck Antibiotic Received.

18. Recheck Antibiotic Received
    a. If Antibiotic Received equals 1, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If Antibiotic Received equals 2, continue processing and proceed to Antibiotic Name.

19. Check Antibiotic Name
    a. If the Antibiotic Grid is not populated, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission. Note: The front-end edits reject cases containing invalid data and/or an incomplete Antibiotic Grid. A complete Antibiotic Grid requires all data elements in the row to contain either a valid value and/or Unable to Determine.

b. If the Antibiotic Name is on Table 2.1, continue processing and recheck Antibiotic Name.

20. Recheck Antibiotic Name
    a. If all of the Antibiotic Names are on Table 3.11, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If at least one of the Antibiotic Names is NOT on Table 3.11, continue processing and proceed to Antibiotic Administration Route. Exclude antibiotic doses on Table 3.11 from further processing.

21. Check Antibiotic Administration Route
    a. If the Antibiotic Administration Route is equal to 3 or 10 for all antibiotic doses, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Antibiotic Administration Route is equal to 1 or 2 for any antibiotic dose, continue processing and proceed to Antibiotic Administration Date. Proceed only with antibiotic doses on Table 2.1 that are administered via routes 1 or 2.

22. Check Antibiotic Administration Date
    a. If the Antibiotic Administration Date is equal to Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Antibiotic Administration Date is equal to a Non Unable to Determine date for at least one antibiotic dose, continue processing and proceed to the Antibiotic Days I calculation. Note: Proceed only with antibiotic doses that have an associated Non Unable to Determine date.

23. Calculate Antibiotic Days I. Antibiotic Days I, in days, is equal to the Surgical Incision Date minus the Antibiotic Administration Date.

24. Check Antibiotic Days I
    a. If the Antibiotic Days I is greater than 1 for at least one antibiotic dose, continue processing and recheck the ICD-9-CM Principal Procedure Code. Do not recheck step 27 Antibiotic Days I, step 28 Surgical Incision Time, steps 29 and 30 Antibiotic Administration Time, or step 31 Antibiotic Timing I.

b. If the Antibiotic Days I is less than or equal to 1 for all antibiotic doses, continue processing. Proceed to step 27 and recheck Antibiotics Days I. Do not recheck ICD-9-CM Principal Procedure Code or Oral Antibiotics.

25. Recheck ICD-9-CM Principal Procedure Code only if Antibiotic Days I is greater than 1 for at least one antibiotic dose
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and check Oral Antibiotics.

26. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If Oral Antibiotics equals Yes, continue processing and proceed to step 35 and check Anesthesia End Date. Do not recheck step 27 Antibiotic Days I, step 28 Surgical Incision Time, steps 29 and 30 Antibiotic Administration Time, or 31 Antibiotic Timing I.

27. Recheck Antibiotic Days I only if Antibiotic Days I was less than or equal to 1 for all antibiotic doses
    a. If the Antibiotic Days I is less than or equal to zero for ALL antibiotic doses, continue processing. Proceed to step 35 and check Anesthesia End Date. Do not check step 28 Surgical Incision Time, step 29 and 30 Antibiotic Administration Time, or step 31 Antibiotic Timing I.
    b. If the Antibiotic Days I is equal to 1 for ANY antibiotic dose, continue processing and proceed to Surgical Incision Time.

28. Check Surgical Incision Time
    a. If the Surgical Incision Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Surgical Incision Time is equal to Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the

Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

c. If the Surgical Incision Time is equal to a Non Unable to Determine Value, continue processing and check Antibiotic Administration Time.

29. Check Antibiotic Administration Time
    a. If the Antibiotic Administration Time equals Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Antibiotic Administration Time equals a Non Unable to Determine time for at least one antibiotic dose, continue processing and recheck Antibiotic Administration Time.

30. Recheck Antibiotic Administration Time
    a. If the Antibiotic Administration Time equals Unable to Determine for ANY antibiotic dose with Antibiotic Days I equal to 1, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Antibiotic Administration Time equals a Non Unable to Determine time for ALL antibiotic doses with Antibiotic Days I equal to 1, continue processing and proceed to the Antibiotic Timing I calculation.

31. Calculate Antibiotic Timing I. Antibiotic Timing I, in minutes, is equal to the Surgical Incision Date and Surgical Incision Time minus the Antibiotic Administration Date and Antibiotic Administration Time. Calculate Antibiotic Timing I for all antibiotic doses with non Unable to Determine date and time. Proceed with antibiotic doses that have Antibiotic Timing I calculated, or Antibiotic Days I less than or equal to zero.

32. Check Antibiotic Timing I
    a. If the Antibiotic Timing I is greater than 1440 minutes for any antibiotic dose, continue processing and recheck the ICD-9-CM Principal Procedure Code. Proceed with antibiotic does that have Antibiotic Timing I calculated, or Antibiotic Days I less than or equal to zero.
    b. If the Antibiotic Timing I is less than or equal to 1440 minutes for all antibiotic doses with non Unable to Determine date and time, continue processing. Proceed to step 35 and check Anesthesia End Date. Do not recheck ICD-9-CM Principal Procedure Code or Oral Antibiotics.

33. Recheck ICD-9-CM Principal Procedure Code only if the Antibiotic Timing I is greater than 1440 minutes for any antibiotic dose
    a. If the ICD-9-CM Principal Procedure Code is not on Table 5.03, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03, continue processing and check Oral Antibiotics.

34. Check Oral Antibiotics
    a. If Oral Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If Oral Antibiotics equals No, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If Oral Antibiotics equals Yes, continue processing and proceed to Anesthesia End Date.

35. Check Anesthesia End Date
    a. If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Anesthesia End Date is equal to Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    c. If the Anesthesia End Date is equal to a Non Unable to Determine value, continue processing and proceed to the Antibiotic Days II calculation.

36. Calculate Antibiotic Days II. Antibiotic Days II, in days, is equal to the Antibiotic Administration Date minus the Anesthesia End Date.

37. Set Exclusion Flag, for all cases, to equal No. If all of the antibiotic doses of a case satisfy one of the two following conditions, set Exclusion Flag (for this case) to equal 'Yes'. These conditions are:
    a. Antibiotic Days II is greater than 3 days regardless of table on which procedure code is on; OR

b. Antibiotic Days II is greater than 2 days AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07, or 5.08.

38. Check Exclusion Flag
    a. If the Exclusion Flag is equal to Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Exclusion Flag is equal to No, continue processing and proceed to check Antibiotic Days II. Remove any dose that satisfies one of the two following conditions. These conditions are:
        1. Antibiotic Days II is greater than 3 days regardless of procedure on which procedure code is on; OR
        2. Antibiotic Days II is greater than 2 days AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07 or 5.08.

39. Check Antibiotic Days II
    a. If the Antibiotic Days II is less than or equal to zero for all antibiotic doses, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
    b. If the Antibiotic Days II is greater than zero for at least one antibiotic dose, continue processing and recheck ICD-9-CM Principal Procedure Code.

40. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.01 or 5.02, continue processing and recheck Antibiotic Days II.
        1. If the Antibiotic Days II is less than 2 days for antibiotic doses, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
        2. If the Antibiotic Days II is greater than or equal to 2 days for at least one antibiotic dose, continue processing and proceed to Anesthesia End Time.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and proceed to Anesthesia End Time.

41. Check Anesthesia End Time
    a. If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS.

Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

b. If the Anesthesia End Time is equal to Unable to Determine, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

c. If the Anesthesia End Time is equal to a Non Unable to Determine Value, continue processing and recheck Antibiotic Administration Time.

42. Recheck Antibiotic Administration Time

a. If the Antibiotic Administration Time equals Unable to Determine for all antibiotic doses, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

b. If the Antibiotic Administration Time equals a Non Unable to Determine time for at least one antibiotic dose, continue processing and proceed to the Antibiotic Timing II calculation. Remove from consideration any antibiotic doses for which Antibiotic Administration Time equals Unable to Determine.

43. Calculate Antibiotic Timing II. Antibiotic Timing II, in minutes, is equal to the Antibiotic Administration Date and Antibiotic Administration Time minus Anesthesia End Date and Anesthesia End Time.

44. Set Exclusion Flag. Set Exclusion Flag, for all cases, to equal 'No'. If all of the antibiotic doses of a case satisfy one of the two following conditions, set Exclusion Flag (for this case) to equal 'Yes'. These conditions are:

a. Antibiotic Timing is greater than 4320 minutes; OR

b. Antibiotic Timing II is greater than 2880 minutes AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07, or 5.08.

45. Check Exclusion Flag

a. If the Exclusion Flag equals Yes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to step 47 and check the Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

b. If the Exclusion Flag equals No, continue processing and recheck ICD-9-CM Principal Procedure Code and Antibiotic Timing II. Remove any dose that satisfies one of the two following conditions. These conditions are:

1. Antibiotic Timing II is greater than 4320 minutes; OR

2. Antibiotic Timing II is greater than 2880 minutes AND ICD-9-CM Principal Procedure Code is on Table 5.03, 5.04, 5.05, 5.06, 5.07, or 5.08.

46. Recheck ICD-9-CM Principal Procedure Code and Antibiotic Timing II

a. If the ICD-9-CM Principal Procedure Code is on Table 5.01 or 5.02 and Antibiotic Timing II is less than or equal to 2880 minutes for all antibiotic doses, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.01 or 5.02 and Antibiotic Timing II is greater than 2880 minutes for at least one antibiotic dose, continue processing and proceed to check Reasons To Extend Antibiotics.

1. If Reasons To Extend Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
2. If Reasons To Extend Antibiotics equals 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
3. If Any Reasons To Extend Antibiotics equals 1, 2, 3 and None equals 4, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

c. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08 and Antibiotic Timing II is less than or equal to 1440 minutes for all antibiotic doses, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

d. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08 and Antibiotic Timing II is greater than 1440 minutes for at least one antibiotic dose, continue processing and proceed to check Reasons To Extend Antibiotics.

1. If Reasons To Extend Antibiotics is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

2. If Reasons To Extend Antibiotics equals 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.
3. If Any Reasons To Extend Antibiotics equals 1, 2, 3 and None equals 4, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing for CMS. Proceed to Stratified Measures for Overall Rate (SCIP-Inf-3a) for The Joint Commission.

47. For The Joint Commission Only, continue processing for the Stratified Measures. Note: Initialize the Measure Category Assignment for each strata measure (b-g) to equal B, not in the Measure Population. Do not change the Measure Category Assignment that was already calculated for the overall rate (SCIP-Inf-3a). The rest of the algorithm will reset the appropriate Measure Category Assignment to be equal to the overall rate's (SCIP-Inf-3a) Measure Category Assignment.

48. Check Overall Rate Category Assignment
    a. If the Overall Rate Category Assignment is equal to B or X, set the Measure Category Assignment for the strata measures (SCIP-Inf-3b through SCIP-Inf-3h) to equal B, not in the Measure Population. Stop processing.
    b. If the Overall Rate Category Assignment is equal to D or E, continue processing and check the ICD-9-CM Principal Procedure Code.

49. Check ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.01, for Stratified Measure SCIP-Inf-3b, set the Measure Category Assignment for measure SCIP-Inf-3b to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.02 or 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

50. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.02, for Stratified Measure SCIP-Inf-3c, set the Measure Category Assignment for measure SCIP-Inf-3c to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.04 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

51. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.04, for Stratified Measure SCIP-Inf-3d, set the Measure Category Assignment for measure SCIP-Inf-3d to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.05 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

52. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.05, for Stratified Measure SCIP-Inf-3e, set the Measure Category Assignment for measure SCIP-Inf-3e to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.03 or 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

53. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.03, for Stratified Measure SCIP-Inf-3f, set the Measure Category Assignment for measure SCIP-Inf-3f to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07 or 5.08, continue processing and recheck the ICD-9-CM Principal Procedure Code.

54. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.06 or 5.07, for Stratified Measure SCIP-Inf-3g, set the Measure Category Assignment for measure SCIP-Inf-3g to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.08, for Stratified Measure SCIP-Inf-3h, set the Measure Category Assignment for measure SCIP-Inf-3h to equal the Measure Category Assignment for measure SCIP-Inf-3a. Stop processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID #: SCIP-Inf-4

Performance Measure Name: Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose

Description: Cardiac surgery patients with controlled 6 A.M. blood glucose (less than or equal to 200 mg/dL) on postoperative day one (POD 1) and postoperative day two (POD 2) with *Anesthesia End Date* being postoperative day zero (POD 0).

Rationale: Hyperglycemia has been associated with increased in-hospital morbidity and mortality for multiple medical and surgical conditions. In a study by Zerr, et al (1997), the risk of infection was significantly higher for patients undergoing coronary artery bypass graft (CABG) if blood glucose levels were elevated. Furthermore, Zerr, et al (2001), demonstrated that the incidence of deep wound infections in diabetic patients undergoing cardiac surgery was reduced by controlling mean blood glucose levels below 200mg/dL in the immediate postoperative period. Latham, et al (2001), found that hyperglycemia in the immediate postoperative phase increases the risk of infection in both diabetic and nondiabetic patients and the higher the level of hyperglycemia, the higher the potential for infection in both patient populations. A study conducted in Leuven, Belgium (Van den Berghe, 2001), demonstrated that intensive insulin therapy not only reduced overall in-hospital mortality but also decreased blood stream infections, acute renal failure, red cell transfusions, ventilator support, and intensive care. Hyperglycemia is a risk factor that, once identified, could minimize adverse outcomes for cardiac surgical patients.

Type of Measure: Process

Improvement Noted As: An increase in the percentage.

Numerator Statement: Surgery patients with controlled 6 A.M. blood glucose (less than or equal to 200 mg/dL) on POD 1 and POD 2.

Included populations: Not applicable

Excluded Populations: None

Data Elements:

- *Glucose POD 1*
- *Glucose POD 2*

Denominator Statement: Cardiac surgery patients with no evidence of prior infection.

Included Populations:

- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes)

AND

- An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.11 for ICD-9-CM codes)

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a length of Stay greater than 120 days
- Patients who had a principal diagnosis suggestive of preoperative infectious diseases (as defined in Appendix A, Table 5.09 for ICD-9-CM codes)
- Burn and transplant patients (as defined in Appendix A, Tables 5.14 and 5.15 for ICD-9-CM codes)
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients with physician/advanced practice nurse/physician assistant (physician/APN/PA) documented infection prior to surgical procedure of interest
- Patients who expired perioperatively

Data Elements:

- *Anesthesia End Date*
- *Anesthesia Start Date*
- *Admission Date*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Infection Prior to Anesthesia*
- *Laparoscope*
- *Perioperative Death*

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: It is important that blood glucose levels be maintained and documented throughout the entire postoperative period. In the course of quality improvement efforts, hospitals may find it useful to drill down to the responses for the data elements *Glucose POD1* and *Glucose POD2*. Further insight may be gained by examining the consistency and values of blood glucose diagnostics and documentation within the organization.

Sampling: Yes, please refer to the measure set 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:

- Gordon SM, Serkey JM, Barr C, et al. The relationship between glycosylated hemoglobin (HgA1c) levels and postoperative infections in patients undergoing primary coronary artery bypass surgery (CABG.) *Infect Control Hosp Epidemiol.* 1997;18(No.5, Part 2):29(58.) PMID: 00000.
- Furnary AP, Zerr KJ, Grunkemeier GL, et al. Continuous intravenous insulin infusion reduces the incidence of deep sternal wound infection in diabetic patients after cardiac surgical procedures. *Ann Thorac Surg.* 1999:67:352-360. PMID: 10197653.
- Golden SH, Peart-Vigilance C, Kao WH, et al. Perioperative glycemic control and the risk of infectious complications in a cohort of adults with diabetes. *Diabetes Care.* 1999 Sep;22(9):1408-1414. PMID: 10480501.
- Trick WE, Scheckler WE, Tokars JI, et al. Modifiable risk factors associated with deep sternal site infection after coronary artery bypass grafting. *J Thorac Cardiovasc Surg.* 2000 Jan;119(1):108-114. PMID: 10612768.
- Trick WE, Scheckler WE, Tokars JI, et al. Risk factors for radial artery harvest site infection following coronary artery bypass graft surgery. *Clin Infect Dis.* 2000 Feb;30(2):270-275.PMID: 10671327.
- Menzin J, Langly-Hawthron C, Friedman M, et al. Potential short-term economic benefits of improved glycemic control: a managed care prospective. *Diabetes Care.* 2001 Jan;24(1):51-55. PMID: 11194241.
- Dellinger E. Preventing Surgical-Site Infections: The importance of timing and glucose control. *Infect Control Hosp Epidemiol.* 2001;22(10):604-606. PMID: 11776344.
- Latham R, Lancaster AD, Covington JF, etal. The association of diabetes and glucose control with surgical-site infections among cardiothoracic surgery

patients. *Infect Control Hosp Epidemiol.* 2001 Oct;22(10):607-612. PMID: 11776345.

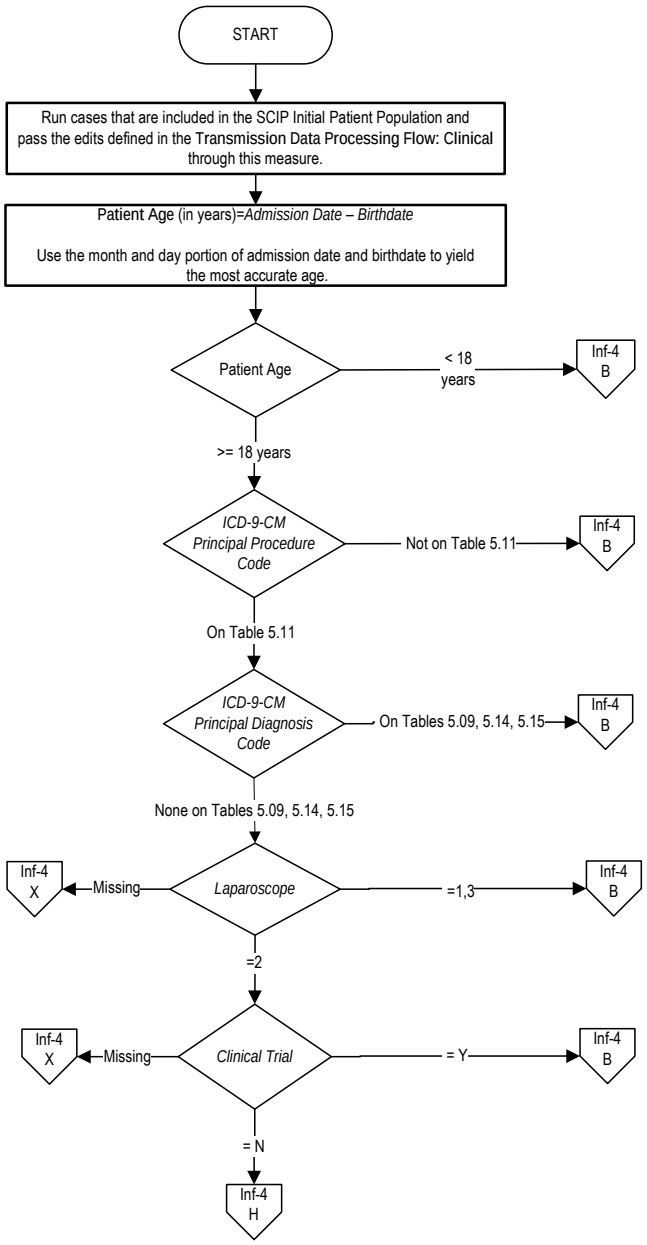
- McAlister FA, Man J, Bistritz L, et al. Diabetes and coronary artery bypass surgery: an examination of perioperative glycemic control and outcomes. *Diabetes Care.* 2003 May;26(5):1518-1524. PMID: 12716815.
- Estrada CA, Young JA, Nifong LW, et al. Outcomes and perioperative hyperglycemia in patients with or without diabetes mellitus undergoing coronary artery bypass grafting. *Ann Thorac Surg.* 2003 May;75(5):1392-1399. PMID: 12735552.
- Terranova A. The effects of diabetes mellitus on wound healing. *Plast Surg Nurs.* 1991:11(1):20-25. PMID: 2034714.
- Woodruff RE, Lewis SB, McLeskey CH, et al. Avoidance of surgical hyperglycemia in diabetic patients. *JAMA.* 1980 Jul 1;244(2):166-168. PMID: 6991732.
- Dellinger EP, Gross PA, Barrett TL, et al: Quality standard for antimicrobial prophylaxis in surgical procedures. Infectious Diseases Society of America. *Clin Infect Dis*. 1994;18: 422-427. PMID: 8207176.
- Zerr KJ, Furnary AP, Grunkemeier GL, et al. Glucose control lowers the risk of wound infection in diabetics after open heart operations. *Ann Thorac Surg*. 1997 Feb;63(2):356-361. PMID: 9033300.
- Pomposelli JJ, Baxter JK 3rd, Babineau TJ, et al. Early postoperative glucose control predicts nosocomial infection rate in diabetic patients. *J Parenter Enteral Nutr.* 1998 Mar-Apr;22(2):77-81. PMID: 9527963.
- Van den Berghe G, Wouters P, Weekers F, et al. Intensive insulin therapy in the critically ill patients. *N Engl J Med*. 2001 Nov 8;345(19):1359-1367. PMID: 11794168.

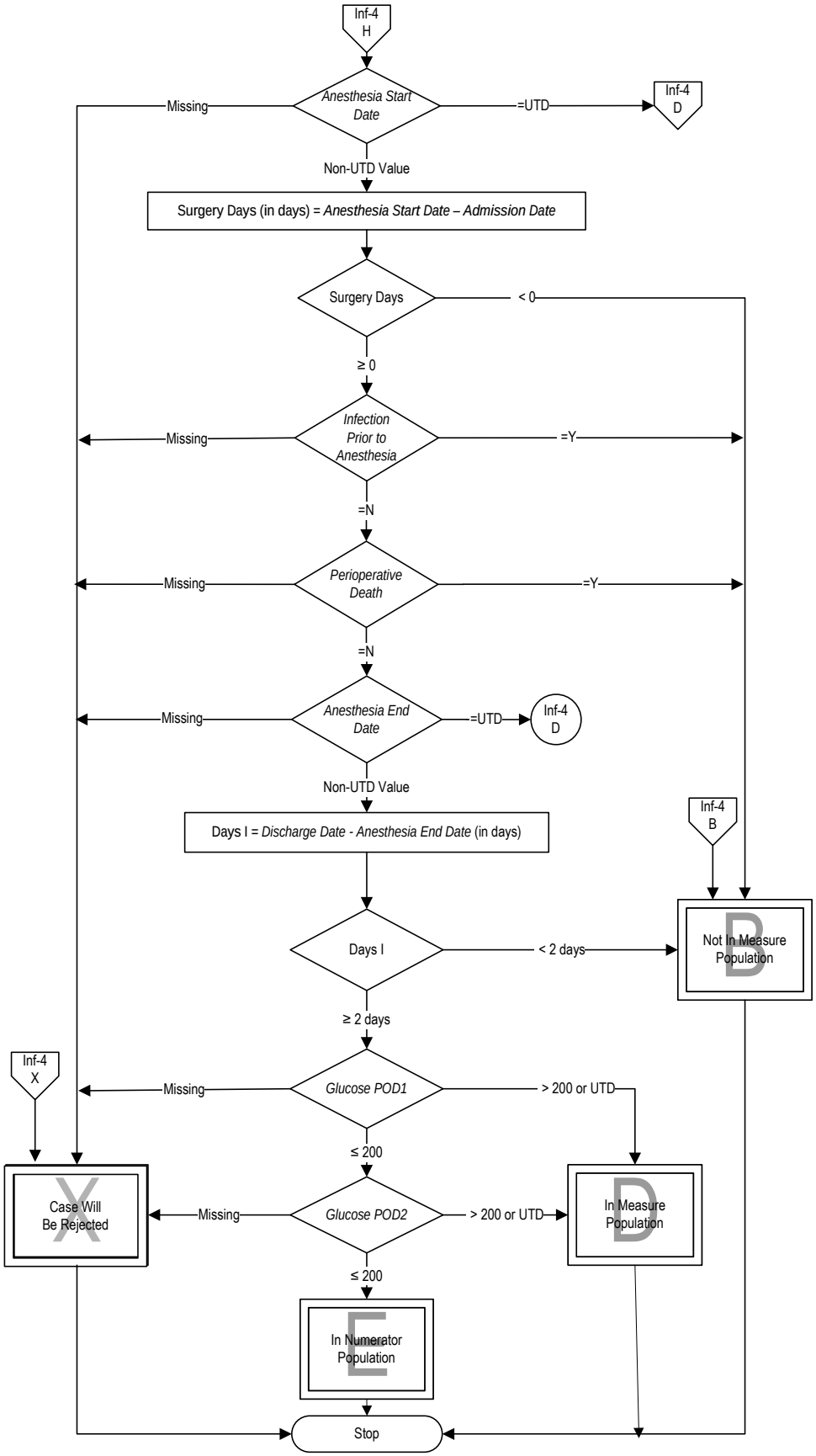
SCIP-Inf-4: Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose

Numerator: Surgery patients with controlled 6 A.M. blood glucose (≤200mg/dL) on POD1 and POD2.

Denominator: Cardiac surgery patients with no evidence of prior Infection.

Variable Key:
Patient Age
Days I
Surgery Days




Inf-4 H
Anesthesia Start Date
Missing
=UTD
Inf-4 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
≥ 0
Infection Prior to Anesthesia
Missing
=Y
=N
Perioperative Death
Missing
=Y
=N
Anesthesia End Date
Missing
=UTD
Inf-4 D
Non-UTD Value
Days I = Discharge Date - Anesthesia End Date (in days)
Inf-4 B
Days I
< 2 days
B
Not In Measure Population
≥ 2 days
Inf-4 X
Glucose POD1
Missing
> 200 or UTD
≤ 200
X
Case Will Be Rejected
Missing
Glucose POD2
> 200 or UTD
D
In Measure Population
≤ 200
E
In Numerator Population
Stop

SCIP-Infection (Inf)-4: Cardiac Surgery Patients With Controlled 6 A.M. Postoperative Blood Glucose

Numerator: Surgery patients with controlled 6 A.M. blood glucose (less than or equal to 200 milligrams per deciliter [mg/dL]) on Postoperative Day (POD) 1 and POD 2.

Denominator: Cardiac surgery patients with no evidence of prior infection.

Variable Key: Patient Age, Days I, Surgery Days

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is not on Table 5.11, 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 is on Table 5.11, continue processing and proceed to ICD-9-CM Principal Diagnosis Code.

5. Check ICD-9-CM Principal Diagnosis Code
   a. If the ICD-9-CM Principal Diagnosis Code is on Table 5.09, 5.14, or 5.15, 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 5.09, 5.14, or 5.15, continue processing and proceed to Laparoscope.

6. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If Laparoscope equals 1 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 Laparoscope equals 2, continue processing and proceed to Clinical Trial.

7. 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 Anesthesia Start Date.

8. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If the Anesthesia Start 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 Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

9. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

10. Check Surgery Days
    a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Infection Prior to Anesthesia.

11. Check Infection Prior to Anesthesia
    a. If Infection Prior to Anesthesia is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Infection Prior to Anesthesia 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 Infection Prior to Anesthesia equals No, continue processing and proceed to Perioperative Death.

12. Check Perioperative Death
    a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Perioperative Death 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 Perioperative Death equals No, continue processing and proceed to Anesthesia End Date.

13. Check Anesthesia End Date
    a. If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia End 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 the Anesthesia End Date equals a Non Unable to Determine value, continue processing and proceed to the Days I calculation.

14. Calculate Days I. Days I, in days, is equal to the Discharge Date minus the Anesthesia End Date.

15. Check Days I
    a. If Days I is less than 2 days, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
    b. If Days I is greater than or equal to 2 days, continue processing and proceed to Glucose POD 1.

16. Check POD 1
    a. If Glucose POD 1 is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Glucose POD 1 is greater than 200 or 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 Glucose POD 1 is less than or equal to 200, continue processing and proceed to Glucose POD 2.

17. Check POD 2
    a. If Glucose POD 2 is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If Glucose POD 2 is greater than 200 or 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 Glucose POD 2 is less than or equal to 200, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-Inf-6

Performance Measure Name: Surgery Patients with Appropriate Hair Removal

Description: Surgery patients with appropriate surgical site hair removal. No hair removal, hair removal with clippers or depilatory is considered appropriate. Shaving is considered inappropriate.

Rationale: Studies show that shaving causes multiple skin abrasions that later may become infected**.** In a randomized study of 1,980 adult patients undergoing cardiopulmonary bypass surgeries, Ko, et al (1992), reported a significantly higher rate of infection among patients who were shaved with a razor than those who had hair removal by electric clippers before skin incision. In another randomized trial of 200 patients undergoing elective inguinal herniorraphy, Balthazar, et al (1982), concluded that hair removal with electric clippers immediately prior to the procedures “did not increase the risk of postoperative wound infection” (p. 799). In a systematic literature review by Kjonniksen, et al (2002), there was no strong evidence to contraindicate preoperative hair removal; however, there was strong evidence against hair removal with a razor. This review recommended depilatory or electric clippers immediately prior to surgery when hair removal was required. Alexander, et al (1983), reported that clippers, used on the morning of surgery, resulted in reduced surgical site infections and healthcare expenditures.

Type of Measure: Process

Improvement Noted As: An increase in the rate.

Numerator Statement: Surgery patients with surgical site hair removal with clippers or depilatory or with no surgical site hair removal.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:
Preoperative Hair Removal

Denominator Statement: All selected surgery patients.

Included Populations:
An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

Excluded Populations:
- Patients less than 18 years of age
- Patients who have a length of Stay greater than 120 days
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients who performed their own hair removal

Data Elements:
- *Admission Date*
- *Anesthesia Start Date*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Procedure Code*
- *Laparoscope*

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: Surgical site hair removal should be performed within the hospital. In the course of quality improvement efforts, hospitals may find it useful to drill down to the responses for the data element *Preoperative Hair Removal*. It may be instructive to tally frequency with which each allowable value occurs. Possible quality improvement initiatives may include: instructing patients against performing their own hair removal, and instructing staff as to the appropriate methods and timing of hair removal.

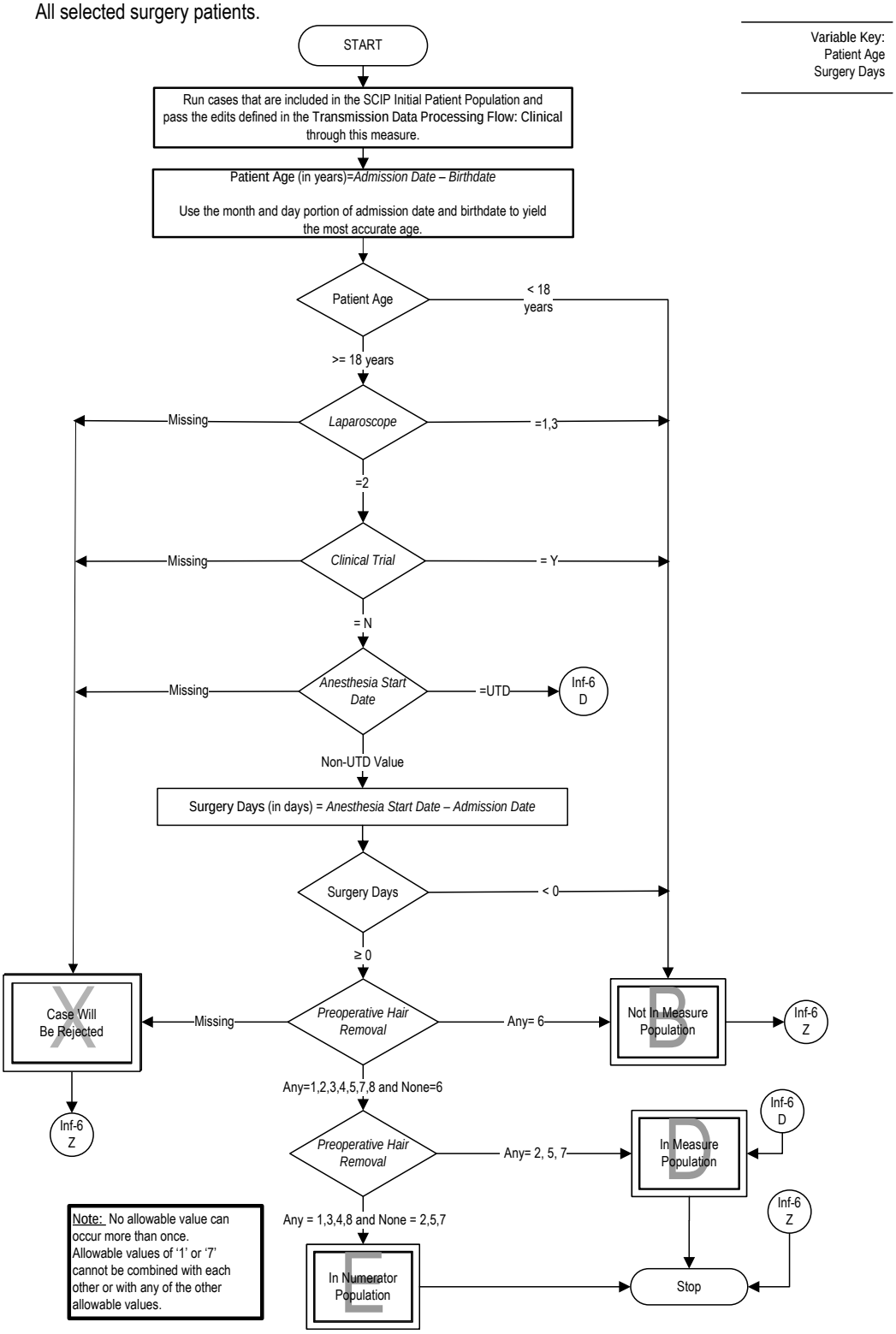
Sampling: Yes, please refer to the measure set specific sampling requirements and for additional information see the Population and Sampling Specifications Section.

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

Selected References:

- Kjonniksen I, Andersen BM, Sondenaa VG, et al. Preoperative hair removal-a systematic literature review. *AORN J*. 2002 May;75 (5):928-938,940. PMID:12063942.
- Ko W, Lazenby WD, Zelano JA, et al. Effects of shaving methods and intraoperative irrigation on suppurative mediastinitis after bypass operations. *Ann Thorac Surg*. 1992 Feb;53 (2):301-305. PMID: 1731672.
- Alexander, JW. Influence of hair removal methods on wound infections. *Archives of Surgery* Vol 118, March 1983. PMID: 6824435.
- Balthazar ER, Colt JD, Nichols RL. Preoperative hair removal: a random prospective study of shaving versus clipping. *South Med J*. 1982 Jul:75(7): 799-801. PMID: 7089645.

SCIP-Inf-6: Surgery Patients with Appropriate Hair Removal
Numerator: Surgery patients with surgical site hair removal with clippers or depilatory or with no surgical site hair removal.
Denominator: All selected surgery patients.



SCIP-Infection (Inf)-6: Surgery Patients with Appropriate Hair Removal

Numerator: Surgery patients with surgical site hair removal with clippers or depilatory or with no surgical site hair removal.

Denominator: All selected surgery patients

Variable Key: Patient Age, Surgery Days

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to Laparoscope.

4. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Laparoscope equals 1 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 Laparoscope equals 2, continue processing and proceed to Clinical Trial.

5. 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 Anesthesia Start Date.

6. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If the Anesthesia Start 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 Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

7. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

8. Check Surgery Days
   a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Preoperative Hair Removal.

9. Check Preoperative Hair Removal – Note: No allowable value can occur more than once. Allowable values of '1' or '7' cannot be combined with each other or with any of the other allowable values.
   a. If Preoperative Hair Removal is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Any Preoperative Hair Removal equals 6, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   c. If Any Preoperative Hair Removal equals 1, 2, 3, 4, 5, 7, or 8 and None equals 6, continue processing and recheck Preoperative Hair Removal.

10. Recheck Preoperative Hair Removal
   a. If Any Preoperative Hair Removal equals 2, 5, or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
   b. If Any Preoperative Hair Removal equals 1, 3, 4, or 8 and None equals 2, 5, or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-Inf-9

Performance Measure Name: Urinary catheter removed on Postoperative Day 1 (POD 1) or Postoperative Day 2 (POD 2) with day of surgery being day zero

Description: Surgical patients with urinary catheter removed on Postoperative Day 1 or Postoperative Day 2 with day of surgery being day zero.

Rationale: It is well–established that the risk of catheter-associated urinary tract infection (UTI) increases with increasing duration of indwelling urinary catheterization. In 2000, Saint reported the results of a pooled analysis of 10 prospective trials dating from 1983 to 1995 which estimated that bacteriuria will develop in 26% of patients after 2 to 10 days of catheterization (95% CI 23-25%). Additional pooled analyses demonstrated that 24% (95% CI 16% to 32%) of those patients will develop symptomatic UTI and bacteremia will develop in 3.6%. Among surgical patients, two studies of postoperative patients discharged to subacute care with urinary catheters were more likely to be readmitted to the hospital with a UTI compared with those who had catheters removed prior to hospital discharges (Wald, 2005 and Wald, 2008). Among selected major surgical patients in the Surgical Infection Project (SIP) cohort, Wald demonstrated (in press) that 85% had perioperative indwelling catheters placed and half of those patients had catheters for greater than 2 days postoperatively. These patients were twice as likely to develop UTIs prior to hospital discharge. On multivariate analysis, those who had indwelling bladder catheters for more than 2 days postoperatively were 21% more likely to develop UTI, significantly less likely to be discharged to home, and had a significant increase in mortality at 30 days. Additional analyses suggest that there is sizeable variation in the duration of postoperative catheterization among hospitals and that hospital factors may account for this variation. In 2006, Stephan reported the results of a multifaceted intervention study in orthopedic surgery patients in which protocols limiting the use and duration of postoperative catheterization played a large role. They reported a resultant 60% reduction in UTI incidence-density.

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: Number of surgical patients whose urinary catheter is removed on POD 1 or POD 2 with day of surgery being day zero.

Included Populations: Not Applicable

Excluded Populations: None

Data Elements:
Catheter Removed

Denominator Statement: All selected surgical patients with a catheter in place postoperatively.

Included Populations:
An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

Excluded Populations:
- Patients less than 18 years of age
- Patients who have a length of Stay greater than 120 days
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients who had a urological, gynecological or perineal procedure performed (refer to Appendix A, Table 5.16 for ICD-9-CM codes)
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients who had other procedures requiring general or spinal anesthesia that occurred within 3 days (4 days for CABG or Other Cardiac Surgery) prior to or after the procedure of interest (during separate surgical episodes) during this hospital stay
- Patients who expired perioperatively
- Patients whose length of stay was less than two days postoperatively
- Patients who had a suprapubic catheter or had intermittent catheterization preoperatively
- Patients who had a urethral catheter, a suprapubic catheter or who were being intermittently catheterized prior to the perioperative period
- Patients who did not have a catheter in place postoperatively
- Patients who had physician/APN/PA documentation of a reason for not removing the urinary catheter postoperatively

Data Elements:
- *Admission Date*
- *Anesthesia End Date*
- *Anesthesia Start Date*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*

- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *ICD-9-CM Other Procedure Code*
- *Laparoscope*
- *Other Surgeries*
- *Perioperative Death*
- *Reasons for Continuing Urinary Catheterization*
- *Urinary Catheter*

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 process-owners for timing of catheter removal, as assessed in this measure, may include clinicians and support staff on the nursing unit. Opportunities may exist in several arenas which, when addressed jointly, can generate true process improvement.

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: Overall aggregate rate for all surgeries and stratified rates by data element *ICD-9-CM Principal Procedure Code*, generated from count data reported as a proportion.

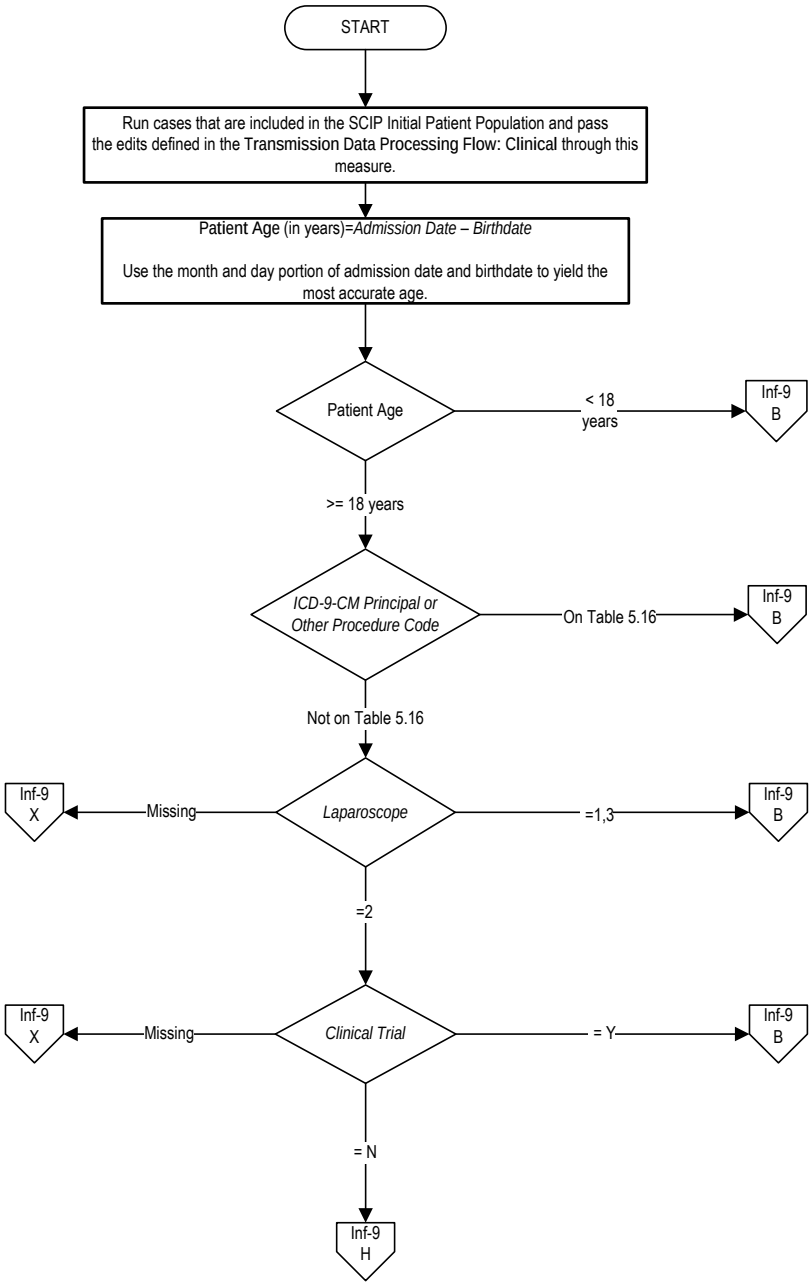
Selected References:

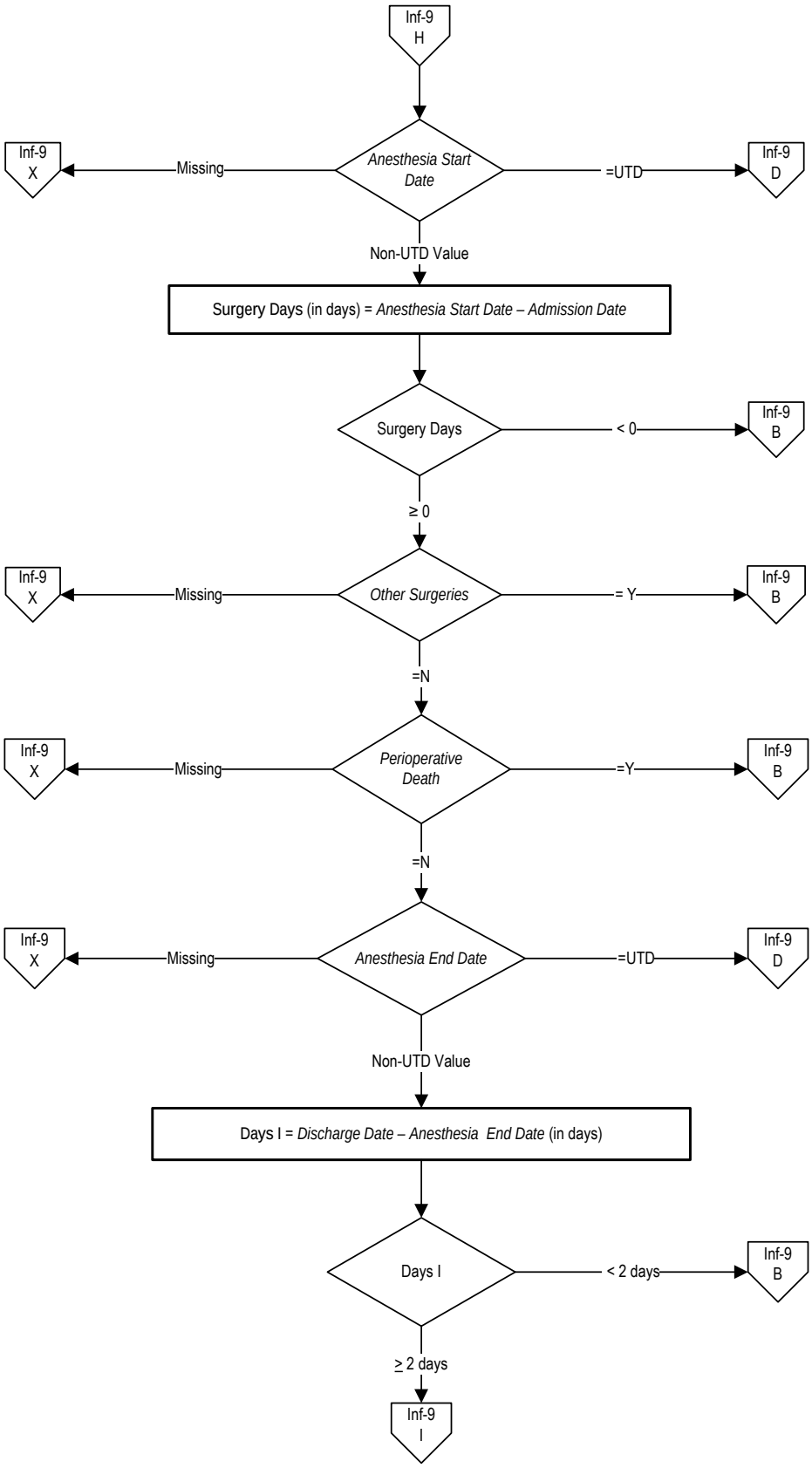
- Saint S. Clinical and economic consequences of nosocomial catheter-related bacteremia. *Am J Infect Control* 2000; 28: 68-75.
- Stephan F, Sax H, Wachsmuth M, et al. Reduction of urinary tract infection and antibiotic use after surgery: a controlled, prospective before-after study. *Clin Infect Dis*. 2006; 42; 1544.
- Wald HL, Ma A, Bratzler DW, Kramer AM. Indwelling Urinary Catheter Use in the Postoperative Period: Analysis of The National Surgical Infection Prevention Project Data. *Arch Surg*. In press.
- Wald H, Epstein A, Kramer A. Extended Urinary Catheterization Among Hip Fracture Patients Discharged to Skilled Nursing Facilities. *Med Care* 2005; 43:1009-1017.
- Wald HL, Epstein AM, Radcliff TA, Kramer AM. Extended Use of Urinary Catheters in Older Surgical Patients: A Patient Safety Problem? *Infect Cont Hosp Epidemiol* 2008; 29:116-124.

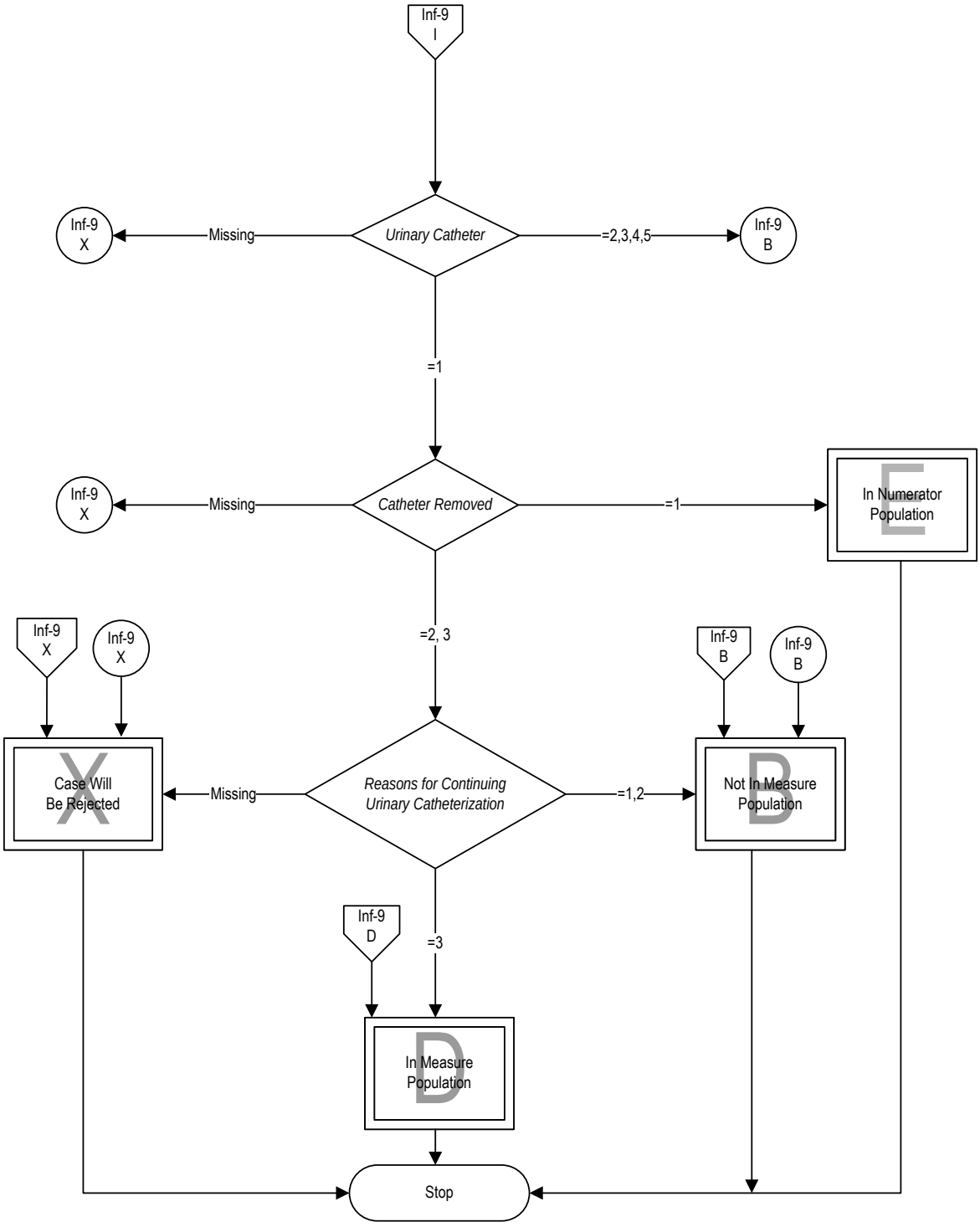
SCIP-Inf-9: Urinary catheter removed on Postoperative Day 1 (POD 1) or Postoperative Day 2 (POD 2) with day of surgery being day zero.

Numerator: Number of surgical patients whose urinary catheter is removed on POD 1 or POD 2 with day of surgery being day zero.

Denominator: All selected surgical patients with a catheter in place postoperatively.




Inf-9 H
Anesthesia Start Date
Missing
Inf-9 X
=UTD
Inf-9 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
Inf-9 B
≥ 0
Other Surgeries
Missing
Inf-9 X
= Y
Inf-9 B
=N
Perioperative Death
Missing
Inf-9 X
=Y
Inf-9 B
=N
Anesthesia End Date
Missing
Inf-9 X
=UTD
Inf-9 D
Non-UTD Value
Days I = Discharge Date – Anesthesia End Date (in days)
Days I
< 2 days
Inf-9 B
≥ 2 days
Inf-9 I


Inf-9 I
Urinary Catheter
Missing
Inf-9 X
=2,3,4,5
Inf-9 B
=1
Catheter Removed
Missing
Inf-9 X
=1
In Numerator Population
E
=2, 3
Inf-9 X
Inf-9 X
Inf-9 B
Inf-9 B
Case Will Be Rejected
X
Missing
Reasons for Continuing Urinary Catheterization
=1,2
Not In Measure Population
B
Inf-9 D
=3
In Measure Population
D
Stop

SCIP-Infection (Inf)-9: Urinary catheter removed on Postoperative Day 1 (POD 1) or Postoperative Day 2 (POD 2) with day of surgery being day zero.

Numerator: Number of surgical patients whose urinary catheter is removed on POD 1 or POD 2 with day of surgery being day zero.

Denominator: All selected surgical patients with a catheter in place postoperatively.

Variable Key: Patient Age, Surgery Days, Days I

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal or Other Procedure Code
   a. If the ICD-9-CM Principal or Other Procedure Code is on Table 5.16, 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 or Other Procedure Code is not on Table 5.16, continue processing and proceed to Laparoscope.

5. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Laparoscope equals 1 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 Laparoscope equals 2, continue processing and proceed to Clinical Trial.

6. 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 Anesthesia Start Date.

7. Check Anesthesia Start Date
    a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia Start 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 Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

8. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

9. Check Surgery Days
    a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Other Surgeries.

10. Check Other Surgeries
    a. If Other Surgeries is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Other Surgeries 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 Other Surgeries equals No, continue processing and proceed to Perioperative Death.

11. Check Perioperative Death
    a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If Perioperative Death 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 Perioperative Death equals No, continue processing and proceed to Anesthesia End Date.

12. Check Anesthesia End Date
    a. If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia End 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 the Anesthesia End Date equals a Non Unable to Determine value, continue processing and proceed to the Days I calculation.

13. Calculate Days I. Days I, in days, is equal to the Discharge Date minus the Anesthesia End Date.

14. Check Days I
    a. If Days I is less than 2 days, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
    b. If Days I is greater than or equal to 2 days, continue processing and proceed to Urinary Catheter.

15. Check Urinary Catheter
    a. If Urinary Catheter is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Urinary Catheter equals 2, 3, 4, or 5, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
    c. If Urinary Catheter equals 1, continue processing and proceed to Catheter Removed.

16. Check Catheter Removed
    a. If Catheter Removed is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Catheter Removed equals 1, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
    c. If Catheter Removed equals 2 or 3, continue processing and check Reasons for Continuing Urinary Catheterization.

17. Check Reasons for Continuing Urinary Catheterization
    a. If Reasons for Continuing Urinary Catheterization is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Reasons for Continuing Urinary Catheterization equals 1 or 2, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
    c. If Reasons for Continuing Urinary Catheterization equals 3, 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: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-Inf-10

Performance Measure Name: Surgery Patients with Perioperative Temperature Management

Description: Surgery patients for whom either active warming was used intraoperatively for the purpose of maintaining normothermia or who had at least one body temperature equal to or greater than 96.8° Fahrenheit/36**°** Celsius recorded within the 30 minutes immediately prior to or the 15 minutes immediately after *Anesthesia End Time.*

Rationale: Core temperatures outside the normal range pose a risk in all patients undergoing surgery. According to the Clinical Guidelines for the Prevention of Unplanned Perioperative Hypothermia by the American Society of PeriAnesthesia Nurses (ASPAN, 2009), published research has correlated impaired wound healing, adverse cardiac events, altered drug metabolism, and coagulopathies with unplanned perioperative hypothermia. A study by Kurtz, et al (1996), found that incidence of culture-positive surgical site infections among those with mild perioperative hypothermia was three times higher than the normothermic perioperative patients. In this study, mild perioperative hypothermia was associated with delayed wound closure and prolonged hospitalization. In a meta-analysis of outcomes and costs, Mahoney and Odom (1999), demonstrated that hypothermia is associated with a significant increase in adverse outcomes, including an increased incidence of infections. The authors also concluded that hypothermia is associated with an increased chance of blood products administration, myocardial infarction, and mechanical ventilation. These adverse outcomes resulted in prolonged hospital stays and increased healthcare expenditures.

Type of Measure: Process

Improvement Noted As: An increase in the rate.

Numerator Statement: Surgery patients for whom either active warming was used intraoperatively for the purpose of maintaining normothermia or who had at least one body temperature equal to or greater than 96.8° Fahrenheit/36**°** Celsius recorded within the 30 minutes immediately prior to or the fifteen minutes immediately after *Anesthesia End Time*.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:
Temperature

Denominator Statement: All patients, regardless of age, undergoing surgical procedures under general or neuraxial anesthesia of greater than or equal to 60 minutes duration

Included Populations:
An *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

Excluded Populations:
- Patients who have a length of stay greater than 120 days
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients whose length of anesthesia was less than 60 minutes
- Patients who did not have general or neuraxial anesthesia
- Patients with physician/APN/PA documentation of *Intentional Hypothermia* for the procedure performed

Data Elements:
- *Admission Date*
- *Anesthesia Type*
- *Anesthesia End Date*
- *Anesthesia Start Date*
- *Anesthesia End Time*
- *Anesthesia Start Time*
- *Discharge Date*
- *ICD-9-CM Principal Procedure Code*
- *Intentional Hypothermia*

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: In analyzing any unexpected measure rates for SCIP-Inf-10, hospitals may find it useful to examine the consistency with which

temperatures are documented after surgery. Inconsistent documentation will reduce the hospital's score.

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.

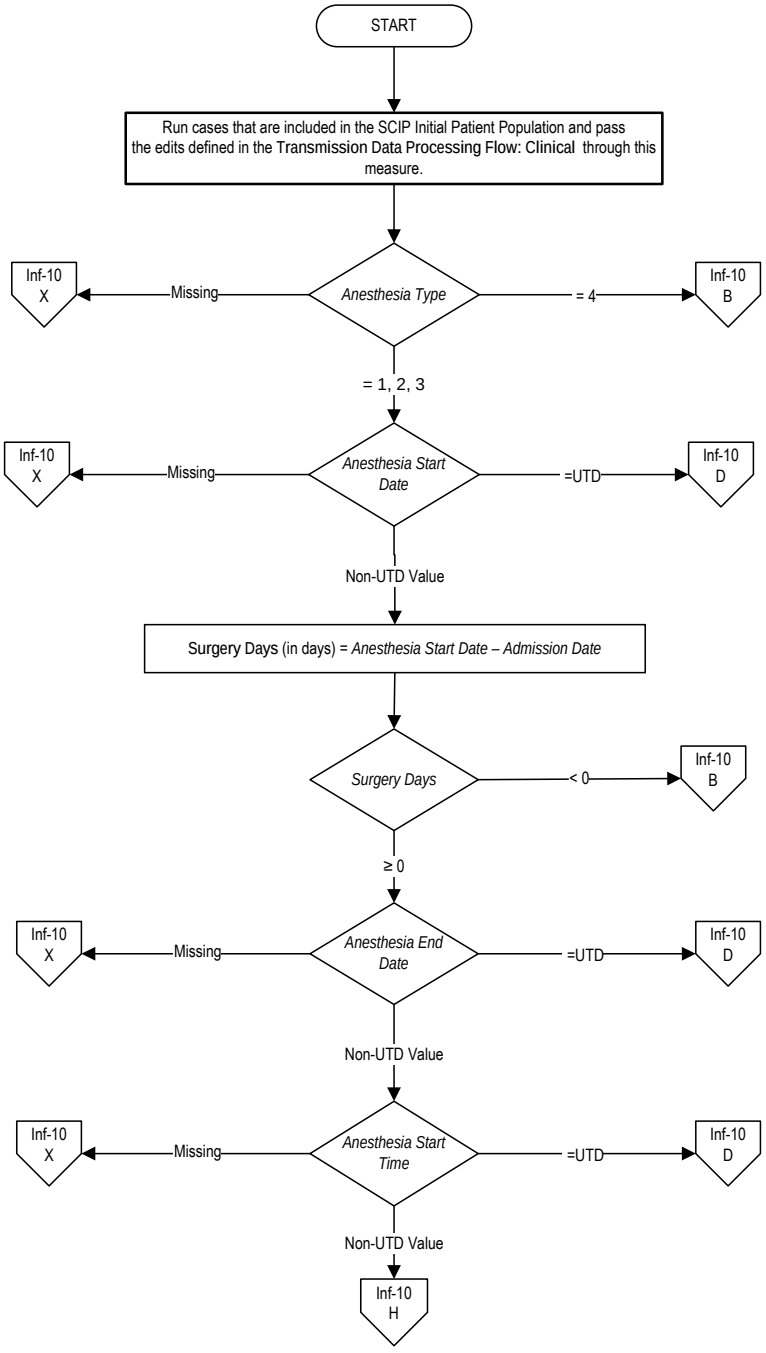
Selected References:

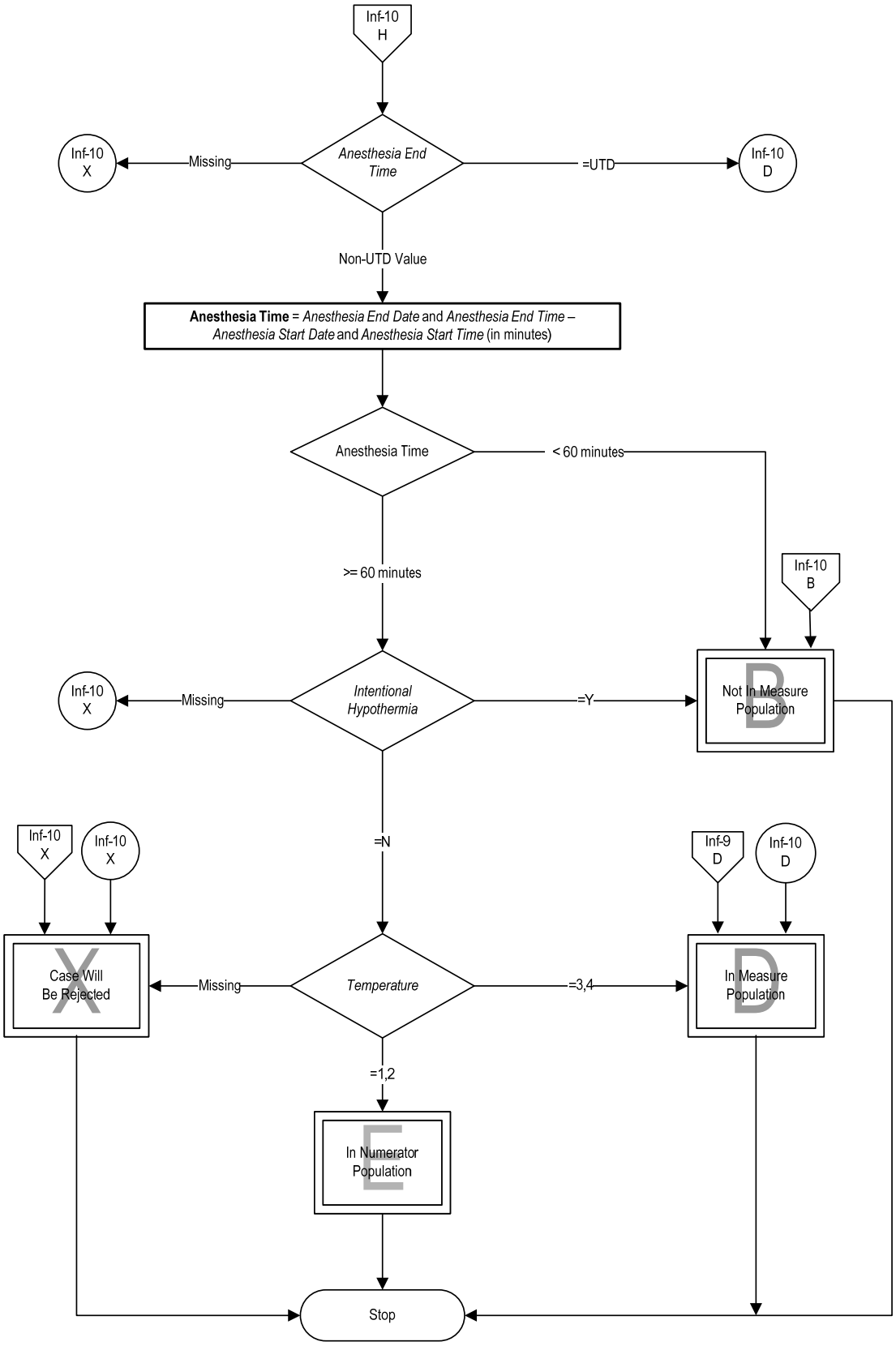
- American Society of PeriAnesthesia Nurses. ASPAN's evidence-based clinical practice guideline for the promotion of perioperative normothermia. 2009 PMID: 1985381.
- Frank SM, Raja SN, Bulaco, C, et al: Relative contributions of core and cutaneous temperature to thermal comfort and autonomic responses in humans. *J Appl Physiol*. 86:1588-1593,1999. PMID: 10233122.
- Mahoney C, Odom J: Maintaining Intraoperative normothermia: a meta-analysis of outcomes with costs. *AANA Journal*. 67:155-164, 1999. PMID: 10488289.
- Hooper V: Perioperative thermoregulation: A survey of clinical practices. Paper presented at the Consensus Conference on Perioperative Thermoregulation, ASPAN, Bethesda, MD, 1998. PMID: 15096446.
- Frank SM, Beattie C, Christopherson R, et al: Epidural versus general anesthesia, ambient operating room temperature, and patient age as predictors of inadvertent hypothermia. *Anesthesiology*. 77:252-257, 1992. PMID: 1642343.
- Carli F, Emery P, Freemantle C: Effect of intraoperative normothermia on postoperative protein metabolism in elderly patients undergoing hip arthroplasty. *Br J Anaesth*. 63:276-282,1989. PMID: 2803885.
- Bennett J, Ramachandra V, Webster J, et al: Prevention of hypothermia during hip surgery: Effect of passive compared with active skin surface warming. *Br J Anaesth*. 73:180-183, 1994. PMID: 7917732.
- Kurz A, Sessler DI, Lenhardt R: Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. *N Engl J Med*. 334:1209-1215, 1996 [Accompanied by an editorial; 334:1263-1264.] PMID: 8606715.
- Sessler DI: Current concepts: Mild intraoperative hypothermia. *N Engl J Med*. 336:1730-1737, 1997. PMID: 9180091.
- Brauer A, Perl T, Uyanik Z, et al: Perioperative thermal insulation: minimally clinically important differences? *Br J Anaesth*. 2004 Jun;92(6):836-840. Epub 2004 Apr 19.
- Sessler DI. A proposal for new temperature monitoring and thermal management guidelines. *Anesthesiology*. 1998; 89 (5):1298-1300.

SCIP-Inf-10: Surgery Patients with Perioperative Temperature Management

Numerator: Surgery patients for whom either active warming was used intraoperatively for the purpose of maintaining normothermia or who had at least one body temperature equal to or greater than 96.8° F/36° C recorded within the 30 minutes immediately prior to or the fifteen minutes immediately after *Anesthesia End Time*.

Denominator: All patients, regardless of age, undergoing surgical procedures under general or neuraxial anesthesia of greater than or equal to 60 minutes duration.




Inf-10 H
Anesthesia End Time
Missing
Inf-10 X
=UTD
Inf-10 D
Non-UTD Value
Anesthesia Time = Anesthesia End Date and Anesthesia End Time – Anesthesia Start Date and Anesthesia Start Time (in minutes)
Anesthesia Time
< 60 minutes
>= 60 minutes
Inf-10 B
Intentional Hypothermia
Missing
Inf-10 X
=Y
B
Not In Measure Population
=N
Inf-10 X
Inf-10 X
Inf-9 D
Inf-10 D
X
Case Will Be Rejected
Missing
Temperature
=3,4
D
In Measure Population
=1,2
E
In Numerator Population
Stop

SCIP-Infection (Inf)-10: Surgery Patients with Perioperative Temperature Management

Numerator: Surgery patients for whom either active warming was used intraoperatively for the purpose of maintaining normothermia or who had at least one body temperature equal to or greater than 96.8 degrees Fahrenheit (F)/36 degrees Celsius (C) recorded within the 30 minutes immediately prior to or the fifteen minutes immediately after Anesthesia End Time.

Denominator: All patients, regardless of age, undergoing surgical procedures under general or neuraxial anesthesia of greater than or equal to 60 minutes duration.

Variable Key: Surgery Days, Anesthesia Time

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Check Anesthesia Type
   a. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Anesthesia Type equals 4, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   c. If Anesthesia Type equals 1, 2, or 3, continue processing and proceed to Anesthesia Start Date.

3. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If the Anesthesia Start 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 the Anesthesia Start Date equals a Non Unable to Determine value, continue processing and proceed to Surgery Days calculation.

4. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

5. Check Surgery Days

a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Anesthesia End Date.

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

7. Check Anesthesia Start Time
   a. If the Anesthesia Start Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If the Anesthesia Start 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 the Anesthesia Start Time equals a Non Unable to Determine value, continue processing and proceed to Anesthesia End Time.

8. Check Anesthesia End Time
   a. If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If the Anesthesia End 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 the Anesthesia End Time equals a Non Unable to Determine value, continue processing and proceed to the Anesthesia Time calculation.

9. Calculate Anesthesia Time. Anesthesia Time, in minutes, is equal to the Anesthesia End Date and Anesthesia End Time minus the Anesthesia Start Date and Anesthesia Start Time.

10. Check Anesthesia Time
    a. If Anesthesia Time is less than 60 minutes, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.

b. If Anesthesia Time is greater than or equal to 60 minutes, continue processing and proceed to Intentional Hypothermia.

11. Check Intentional Hypothermia
    a. If Intentional Hypothermia is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Intentional Hypothermia 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 Intentional Hypothermia equals No, continue processing and check Temperature.

12. Check Temperature
    a. If Temperature is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Temperature equals 3 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
    c. If Temperature equals 1 or 2, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form

Measure Set: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-Card-2

Performance Measure Name: Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

Description: Surgery patients on beta-blocker therapy prior to arrival who received a beta-blocker during the perioperative period. The perioperative period for the SCIP Cardiac measures is defined as 24 hours prior to surgical incision through discharge from post-anesthesia care/recovery area.

Rationale: Concerns regarding the discontinuation of beta-blocker therapy in the perioperative period have existed for several decades. Shammash and colleagues studied a total of 140 patients who received beta-blockers preoperatively. Mortality in the 8 patients who had beta-blockers discontinued postoperatively (50%) was significantly greater than in the 132 patients in whom beta-blockers were continued. Hoeks and colleagues studied 711 consecutive peripheral vascular surgery patients. After adjustment for potential confounders and the propensity of its use, continuous beta-blocker use remained significantly associated with a lower 1-year mortality than among nonusers. In contrast, beta-blocker withdrawal was associated with an increased risk of 1-year mortality compared with nonusers. The American College of Cardiology/American Heart Association site continuation of beta-blocker therapy in the perioperative period as a class I indication, and accumulating evidence suggests that titration to maintain tight heart rate control should be the goal.

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: Surgery patients on beta-blocker therapy prior to arrival who receive a beta-blocker during the perioperative period

Included Populations: Not applicable

Excluded Populations: None

Data Elements:
Beta-Blocker Perioperative

Denominator Statement: All surgery patients on beta-blocker therapy prior to arrival.

Included Populations:
ICD-9-CM Principal Procedure Code of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

Excluded Populations:
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients whose ICD-9-CM principal procedure was performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients who expired during the perioperative period
- Pregnant patients taking a beta-blocker prior to arrival
- Patients with a documented *Reason for Not Administering Beta-Blocker-Perioperative*

Data Elements:
- *Admission Date*
- *Anesthesia Start Date*
- *Beta-Blocker Current Medication*
- *Beta-Blocker During Pregnancy*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Procedure Code*
- *Laparoscope*
- *Perioperative Death*
- *Reason for Not Administering Beta-Blocker-Perioperative*
- *Sex*

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: This measure seeks to identify surgery patients who were on beta-blocker therapy prior to arrival that received a perioperative beta-blocker. Health care organizations can identify patients who were on beta-blocker therapy for an extended period of time and compare them to those who received beta-blockers perioperatively, or those who did not receive the medication due to other reasons, i.e., complications or early discharges. An additional step would be to correlate the post hospital stay period to the beta-blocker administration during the pre/perioperative period. This will allow health care organization to take appropriate steps to ensure that patients receive the necessary care to reduce the risk of cardiovascular complications in the postoperative period.

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:

- Manual of Medical Therapeutics. Department of Medicine Washington University, School of Medicine, St. Louis, MO, GA Ewald and CR McKenzie editors. 28th Edition, 1995. PMID: 0000000.
- Belzberg H, Rivkind AI. Preoperative cardiac preparation. *Chest*. 1999;115:82S-95S. PMID: 10331339.
- Poldermans D, Boersma E, Bax JJ, et al, for the DECREASE Study Group. The effect of bisoprolol on perioperative mortality and myocardial infarction in high-risk patients undergoing vascular surgery. *N Engl J Med*. 1999;24:1789-1794. PMID: 10588963.
- Shammash JB, Trost JC, Gold JM, et al. Perioperative beta-blocker withdrawal and mortality in vascular surgical patients. *Am Heart J*. 2001;141:148-153. PMID: 11136500.
- Boersma E, Poldermans D, Bax JJ, et al, for the Dutch Echocardiographic Cardiac Risk Evaluation Applying Stress Echocardiography (DECREASE) Study Group. Predictors of cardiac events after major vascular surgery: role of clinical characteristics, dobutamine echocardiography. PMID:11308400.
- Pasternack PF, Imparato AM, Baumann FG, et al. The hemodynamics of beta-blockade in patients undergoing abdominal aortic aneurysm repair. *Circulation*. 1987;76(suppl 3, pt 2):III-1-7. PMID:3621532.
- Yaeger RA, Moneta GL, Edwards JM, et al. Reducing perioperative myocardial infarction following vascular surgery. The potential role of beta-blockade. *Arch Surg* 1995;130(8):869. PMID:7632148.
- Yusuf S, Peto R, Lewis J, Collins R, et al. Beta Blockade during and after myocardial infarction: an overview of the randomized trials. *Prog Cardiovasc Dis* 1985; 27: 335-371. PMID: 2858114.
- McGory ML, Maggard MA, Ko CY. A meta-analysis of perioperative beta blockade: What is the actual risk reduction? *Surgery*. 2005 Aug;138(2):171-179. PMID: 16153424.
- Fleisher LA, Beckman JA, Brown KA, Calkins H, et al. ACC/AHA 2007

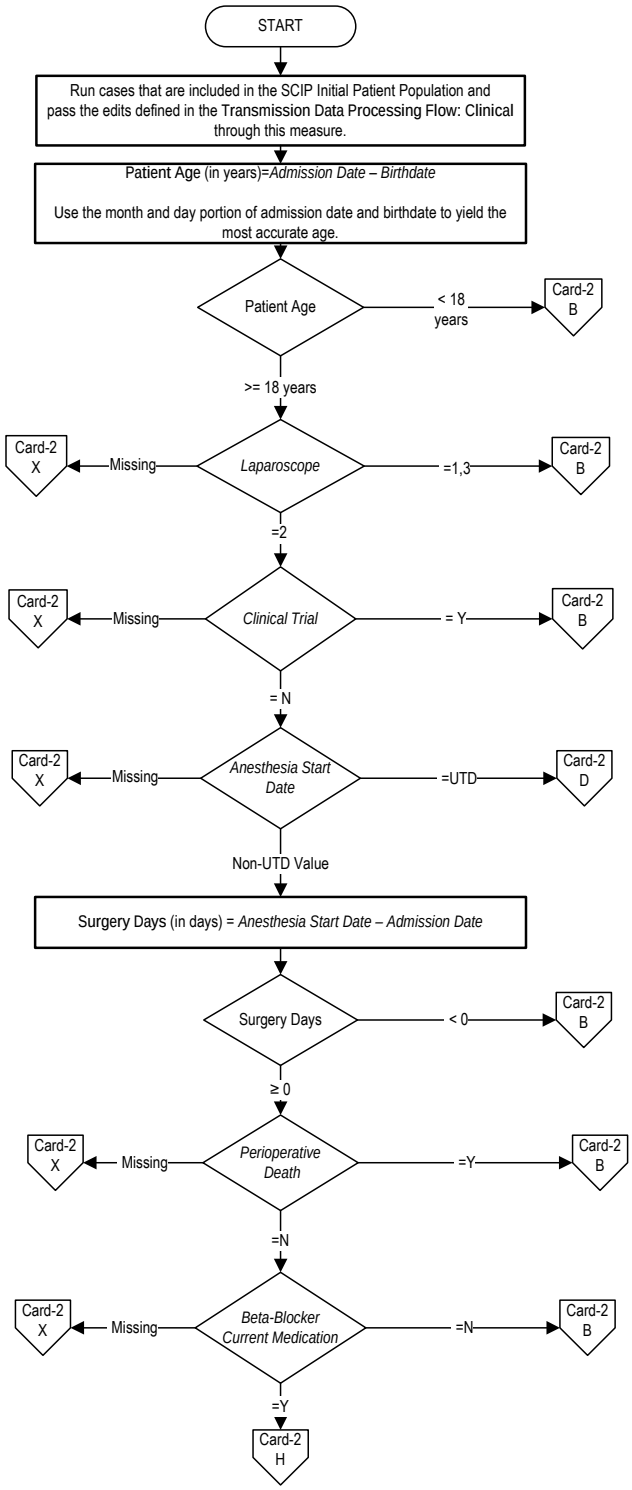
Guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery). *J Am Coll Cardiol* 2007; 50: e159-241.

- Goldman L. Noncardiac surgery in patients receiving propranolol. Case reports and recommended approach. *Arch Intern Med* 1981;141:193-6.
- Hoeks SE, Scholte Op Reimer WJ, van Urk H, et al. Increase of 1-year mortality after perioperative beta-blocker withdrawal in endovascular and vascular surgery patients. *Eur J Vasc Endovasc Surg* 2007;33:13–9.

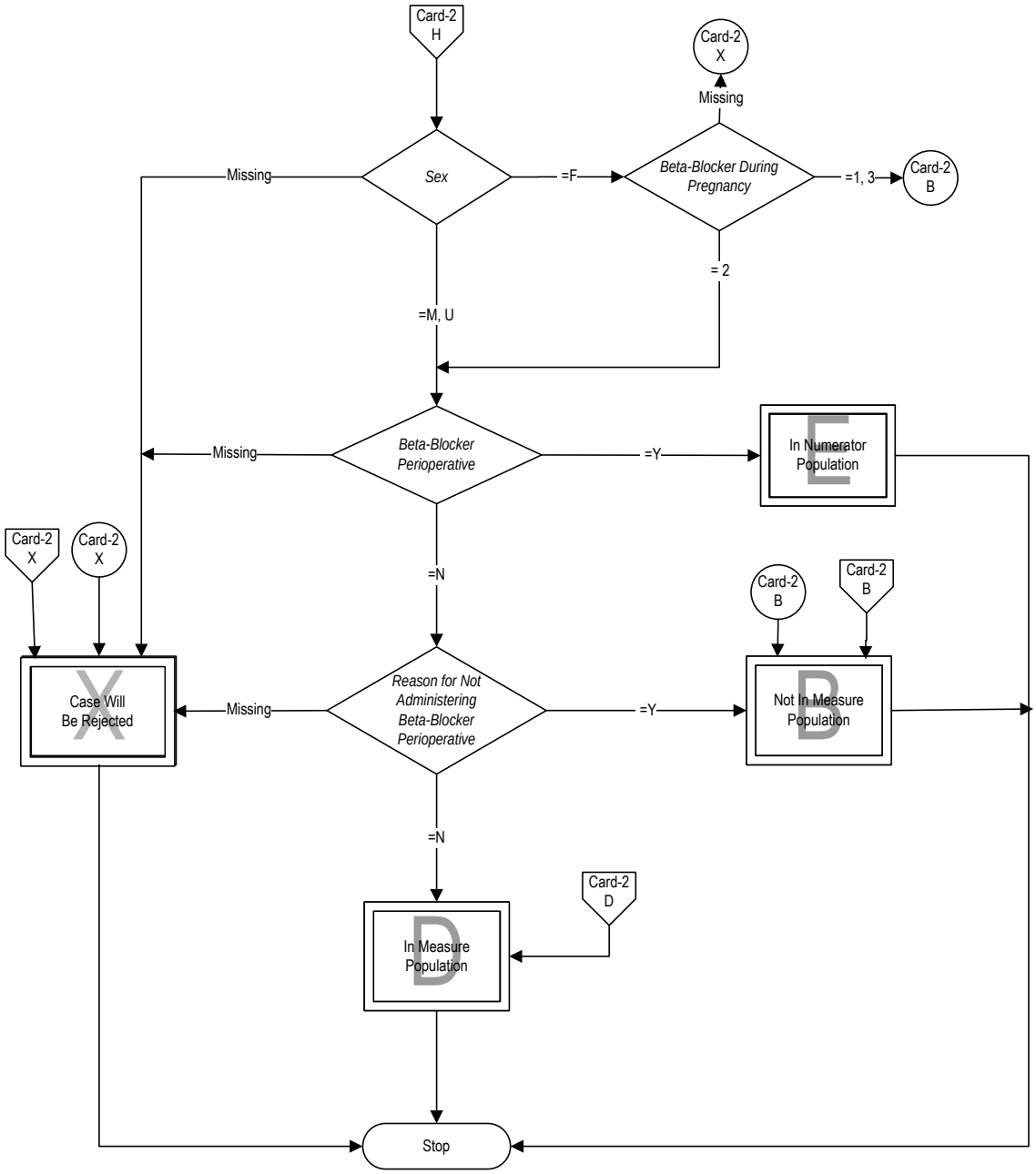
SCIP-Card-2: Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

Numerator: Surgery patients on beta-blocker therapy prior to arrival who receive a beta-blocker during the perioperative period.

Denominator: All surgery patients on beta-blocker therapy prior to arrival.



Variable Key:
Patient Age
Surgery Days


Card-2
H
Card-2
X
Missing
Sex
Missing
=F
Beta-Blocker During
Pregnancy
=1, 3
Card-2
B
= 2
=M, U
Beta-Blocker
Perioperative
Missing
=Y
E
In Numerator
Population
Card-2
X
Card-2
X
=N
Card-2
B
Card-2
B
X
Case Will
Be Rejected
Missing
Reason for Not
Administering
Beta-Blocker
Perioperative
=Y
B
Not In Measure
Population
=N
Card-2
D
D
In Measure
Population
Stop

SCIP-Cardiac (Card)-2: Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period

Numerator: Surgery patients on beta-blocker therapy prior to arrival who received a beta-blocker during the perioperative period.

Denominator: All surgery patients on beta-blocker therapy prior to arrival.

Variable Key: Patient Age, Surgery Days

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to Laparoscope.

4. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Laparoscope equals 1 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 Laparoscope equals 2, continue processing and proceed to Clinical Trial.

5. 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 Anesthesia Start Date.

6. Check Anesthesia Start Date
    a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia Start 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 Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

7. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

8. Check Surgery Days
    a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Perioperative Death.

9. Check Perioperative Death
    a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Perioperative Death 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 Perioperative Death equals No, continue processing and proceed to Beta-Blocker Current Medication.

10. Check Beta-Blocker Current Medication
    a. If the Beta-Blocker Current Medication is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Beta-Blocker Current Medication 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 the Beta-Blocker Current Medication equals Yes, continue processing and proceed to Sex.

11. Check Sex
    a. If Sex is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If Sex equals Female, continue processing and check Beta-Blocker During Pregnancy.
    1. If Beta-Blocker During Pregnancy is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    2. If Beta-Blocker During Pregnancy equals 1 or 3, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
    3. If Beta-Blocker During Pregnancy equals 2, continue processing and proceed to Beta-Blocker Preoperative.
c. If Sex equals Male or Unknown, continue processing and proceed to Beta-Blocker Perioperative.

12. Check Beta-Blocker Perioperative
    a. If Beta-Blocker Perioperative is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Beta-Blocker Perioperative 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 Perioperative equals No, continue processing and check Reason for Not Administering Beta-Blocker Perioperative.

13. Check Reason for Not Administering Beta-Blocker Perioperative
    a. If Reason for Not Administering Beta-Blocker Perioperative is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Reason for Not Administering Beta-Blocker Perioperative 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 Administering Beta-Blocker Perioperative 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: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-VTE-1

Performance Measure Name: Surgery Patients with Recommended Venous Thromboembolism Prophylaxis Ordered

Description: Surgery patients with recommended Venous Thromboembolism (VTE) prophylaxis ordered anytime from hospital arrival to 24 hours after *Anesthesia End Time*.

Rationale: There are over 30 million surgeries performed in the United States each year. Despite the evidence that VTE is one of the most common postoperative complications and prophylaxis is the most effective strategy to reduce morbidity and mortality, it is often underused. The frequency of Venous Thromboembolism (VTE), that includes deep vein thrombosis and pulmonary embolism, is related to the type and duration of surgery, patient risk factors, duration and extent of postoperative immobilization, and use or nonuse of prophylaxis. According to Heit et al, 2000, surgery was associated with over a twenty-fold increase in the odds of being diagnosed with VTE. Studies have shown that appropriately used thromboprophylaxis has a positive risk/benefit ratio and is cost effective. Prophylaxis recommendations for this measure are based on selected surgical procedures from the 2008 American College of Chest Physicians guidelines.

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: Surgery patients with recommended Venous Thromboembolism (VTE) prophylaxis ordered anytime from hospital arrival to 24 hours after *Anesthesia End Time.*

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- *Anesthesia Type*
- *VTE Prophylaxis*

Denominator Statement: All selected surgery patients.

Included Populations:

- *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes).

AND

- *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.17-5.24 for ICD-9-CM codes).

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Burn patients (as defined in Appendix A, Table 5.14 for ICD-9-CM codes)
- Patients with procedures performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients who are on warfarin prior to admission
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients whose total surgery time is less than or equal to 60 minutes
- Patients who expire perioperatively
- Patients who stay less than two nights
- Patients with reasons for not administering both mechanical and pharmacological prophylaxis

Data Elements:

- *Admission Date*
- *Anesthesia End Date*
- *Anesthesia End Time*
- *Anesthesia Start Date*
- *Anesthesia Start Time*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*
- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Laparoscope*
- *Perioperative Death*
- *Preadmission Warfarin*
- *Reason for Not Administering VTE Prophylaxis*

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: Measure rates for SCIP-VTE-1 should be analyzed in order to identify where quality improvement efforts should be focused. In the course of these efforts, hospitals may find it useful to drill down by types of surgery to the responses for the data element *VTE Prophylaxis*. The analysis would identify surgical patients who had prophylaxis ordered which was not the recommended prophylaxis.

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:

- Chapter 31 of Making Healthcare Safer: A Critical Analysis of Patient Safety Practices. Prepared for Agency for Healthcare Research and Quality, Contract No. 290-97-0013. Prevention of Venous Thromboembolism. PMID: 00000.
- Stratton MA, Anderson FA, Bussey HI, Caprini J. Prevention of venous thromboembolism: adherence to the 1995 American College of Chest Physicians Consensus Guidelines for Surgical Patients. *Arch Intern Med*. 2000;160:334-3. PMID: 10668835.
- Amarigiri SV, Lees TA. Elastic compression stockings for prevention of deep vein thrombosis. *The Cochrane Library*. Issue1, 2001. PMID: 10908501.
- Iorio A, Agnelli G. Low-molecular-weight and unfractionated heparin for prevention of venous thromboembolism in neurosurgery: a meta-analysis. *Arch Intern Med*. 2000;160:2327-2332. PMID: 10927730.
- Goldhaber SZ, Dunn K, MacDougall RC. New onset of venous thromboembolism among hospitalized patients at Brigham and Women's Hospital is caused more often by prophylaxis failure than by withholding treatment. *Chest*. 2000;118:1680-1684. PMID: 11115458.
- O'Donnell M, Weitz JI. Thromboprophylaxis in surgical patients. *Can J Surg*. 2003; 46(2): 129-135. PMID: 12691354.
- Geerts WH, Bergqvist D, Pineo GF, Heit JA, Samama CM, Lassen MR, Colwell CW. Prevention of venous thromboembolism. The Eighth ACCP Conference on antithrombotic and thrombolytic therapy. *Chest* 2008; 133:381S-453S. PMID: 18574271.
- Janku GV, Paiement GD, Green HD. Prevention of venous thromboembolism in orthopaedics in the United States. *Clin Ortho & Related Research*. 1996:313-321. PMID: 8998892.
- Koch A, Bouges S, Ziegler S, et al. Low molecular weight heparin and infractionated heparin in thrombosis prophylaxis after major surgical intervention: update of previous meta-analyses. *Br J Surg*. 1997;84:750-759. PMID: 9189079.
- Palmer AJ, Schramm W, Kirchhof B, et al. Low molecular weight heparin and unfractionated heparin for prevention of thrombo-embolism in general surgery: a meta-analysis of randomised clinical trials. *Haemostasis*. 1997;27:65-74. PMID:

9212354.
- Bratzler DW, Raskob GE, Murray CK, et al. Underuse of venous thromboembolism prophylaxis for general surgery patients: physician practices in the community hospital setting. *Arch Intern Med*. 1998;158:1909-1912. PMID: 9759687.
- Vanek VW. Meta-analysis of effectiveness of intermittent pneumatic compression devices with a comparison of thigh-high to knee-high sleeves. *American Surgeon*. 1998;64:1050-1058. PMID: 9798767.
- Hull RD, Brant RF, Pineo GF, et al. Preoperative vs postoperative initiation of low-molecular-weight heparin prophylaxis against venous thromboembolism in patients undergoing elective hip replacement. *Arch Intern Med*. 1999;159:137-141. PMID: 9927095.
- Heit JA, Silverstein MD, Mohr DN, Petterson TM, O'Fallon WM, Melton LJ, III. Risk factors for deep vein thrombosis and pulmonary embolism: a population-based case-control study. *Arch Intern Med* 2000;160:809-815.
- Abrams PJ, Emerson CR. Rivaroxaban: A Novel, Oral, Direct Factor Xa Inhibitor. *Pharmacotherapy.* February 2009:167-181.
- Borris LC, Rivaroxaban, A New, Oral Direct Factor Xa Inhibitor for Thromboprophylaxis after Major Joint Arthroplasty*. Expert Opinion on Pharmacotherapy.* 2009 Apr,10(6):1083-8.
- E*riksson B*I, *Kakkar A*K, Turpie AG, Gent M, Bandel TJ, Homering M, Misselwitz F, Lassen MR..Oral Rivaroxaban for the Prevention of symptomatic Venous Thromboembolism After Elective Hip and Knee Replacement. *Journal of Bone and Joint Surgery – British Volume.* Vol 91-B, Issue 5, 636-64.
- Turpie AG, Lassen MR, Davidson BL, et. Al. Rivaroxaban versus enoxaprin for thromboprophylaxis after total knee arthroplasty (RECORD4): a randomized trial. *The Lancet,* Volume 373, Issue 9676, Pages 1673-180, 16 May 2009.

VTE Prophylaxis Options for Surgery	
Surgery Type	**Recommended Prophylaxis Options[1]**
Intracranial Neurosurgery Appendix A, Table 5.17	Any of the following: • Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS) • Low-dose unfractionated heparin (LDUH) Low molecular weight heparin (LMWH)[2] • LDUH or LMWH[2] combined with IPC or GCS
General Surgery Appendix A, Table 5.19	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
General Surgery with a reason for not administering pharmacological prophylaxis Appendix A, Table 5.19	Any of the following: • Graduated Compression stockings (GCS) • Intermittent pneumatic compression devices (IPC)
Gynecologic Surgery Appendix A, Table 5.20	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (fondaparinux) • Intermittent pneumatic compression devices (IPC) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
Urologic Surgery Appendix A, Table 5.21	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (fondaparinux) • Intermittent pneumatic compression devices (IPC) • Graduated compression stockings (GCS) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
Elective Total Hip Replacement Appendix A, Table 5.22	Any of the following started within 24 hours of surgery: • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin

VTE Prophylaxis Options for Surgery	
Surgery Type	**Recommended Prophylaxis Options[1]**
Elective Total Knee Replacement Appendix A, Table 5.23	Any of the following: • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP)
Hip Fracture Surgery Appendix A, Table 5.24	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin
Elective Total Hip Replacement with a reason for not administering pharmacological prophylaxis Appendix A, Table 5.22	Any of the following: • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP)
Hip Fracture Surgery with a reason for not administering pharmacological prophylaxis Appendix A, Table 5.24	Any of the following: • Graduated Compression Stockings (GCS) • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP)

[1] Patients who receive neuraxial anesthesia or have a documented reason for not administering pharmacological prophylaxis may pass the performance measure if either appropriate pharmacological or mechanical prophylaxis is ordered.

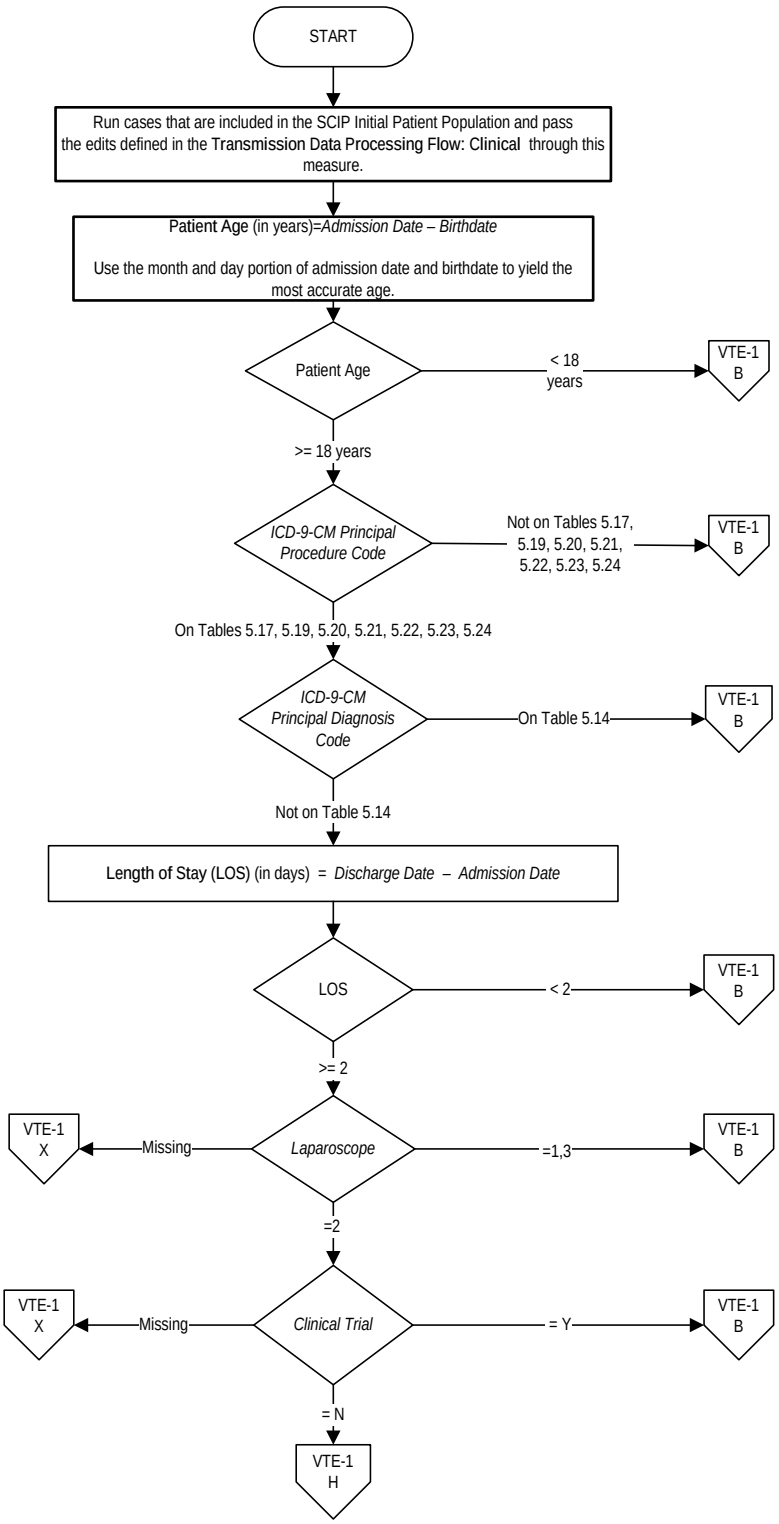
[2] Current guidelines recommend postoperative low molecular weight heparin for Intracranial Neurosurgery.

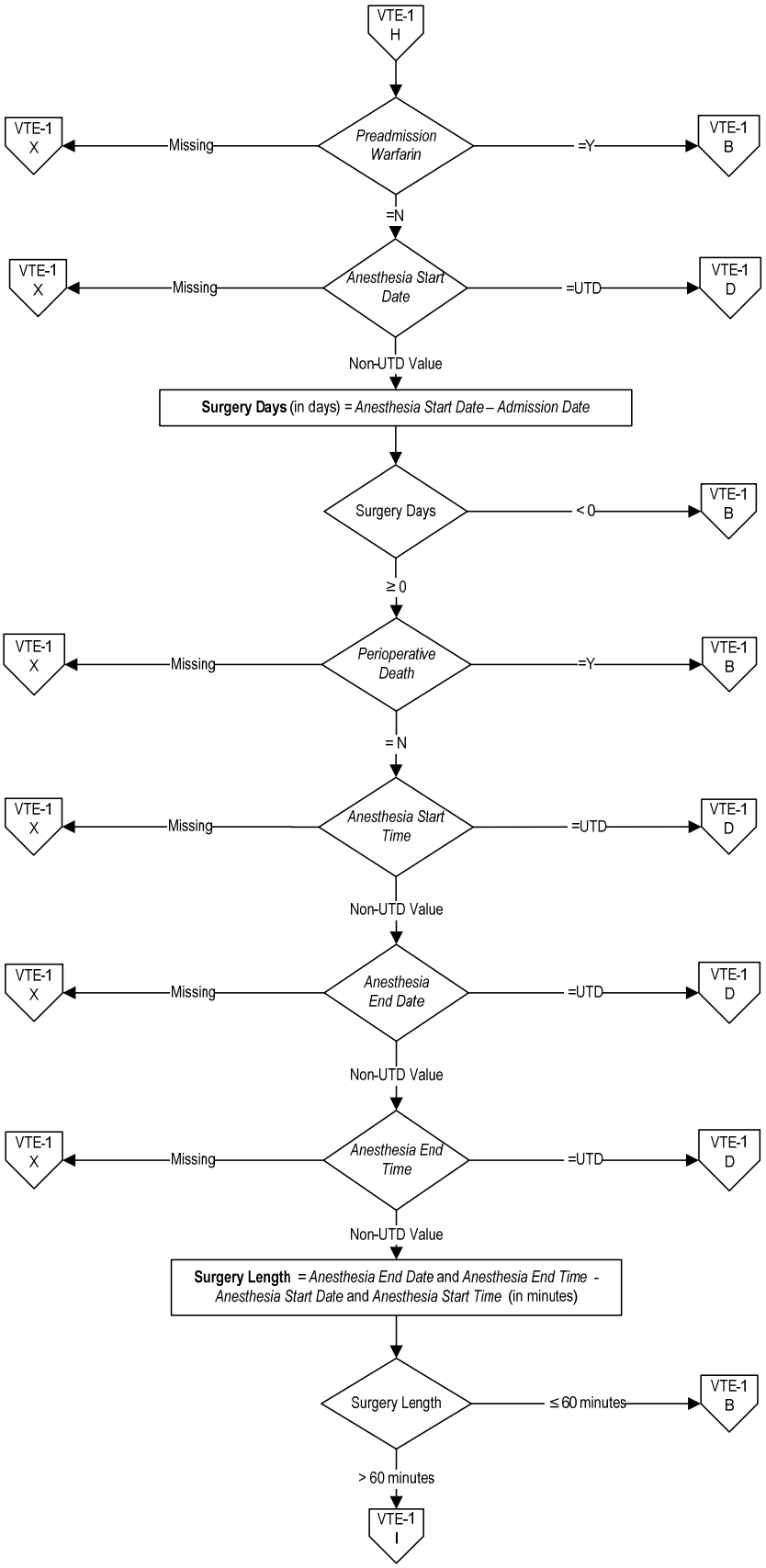
SCIP-VTE-1: Surgery patients with Recommended Venous Thromboembolism Prophylaxis Ordered

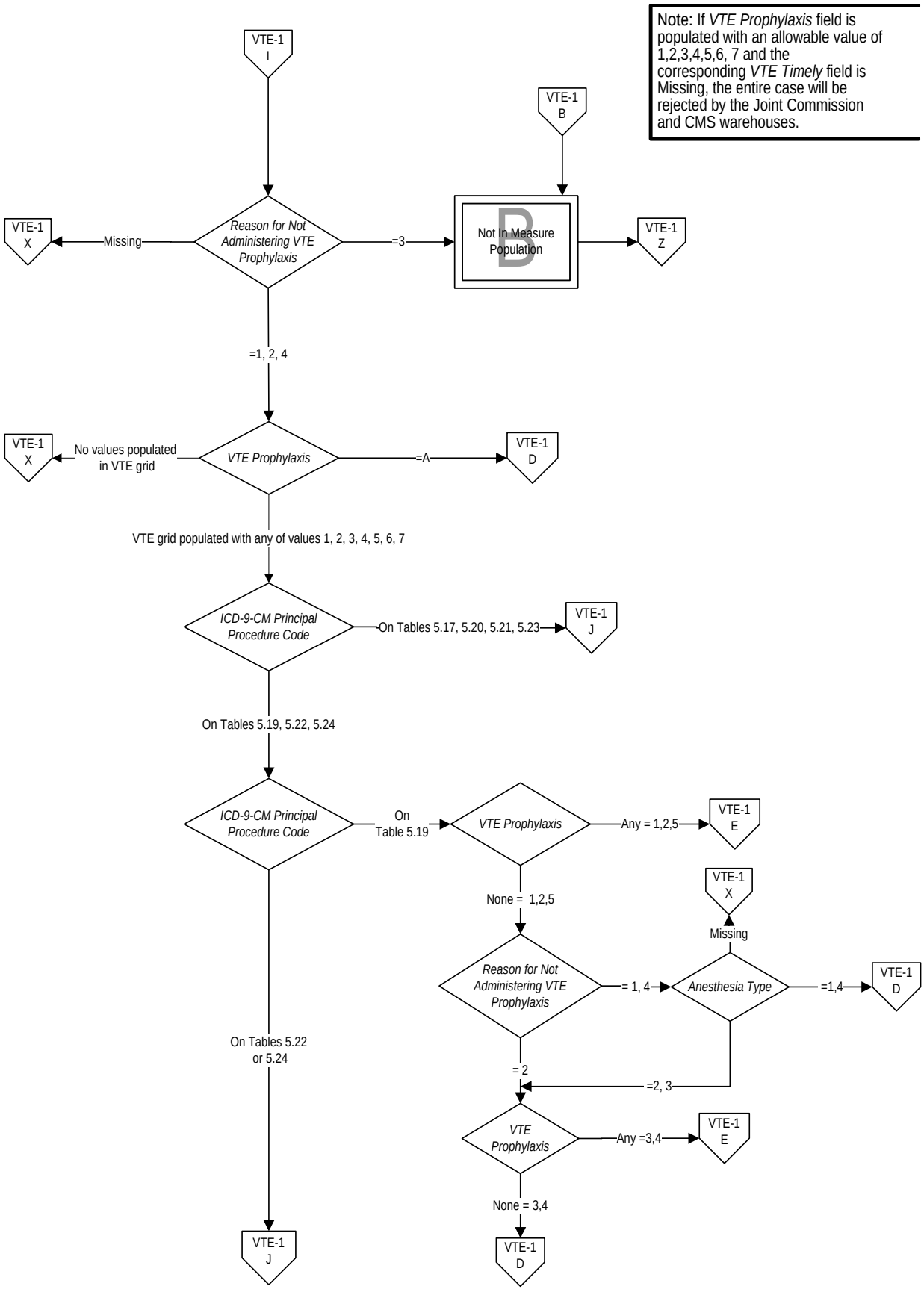
Numerator: Surgery patients with recommended venous thromboembolism (VTE) prophylaxis ordered anytime from hospital arrival to 24 hours after *Anesthesia End Time.*

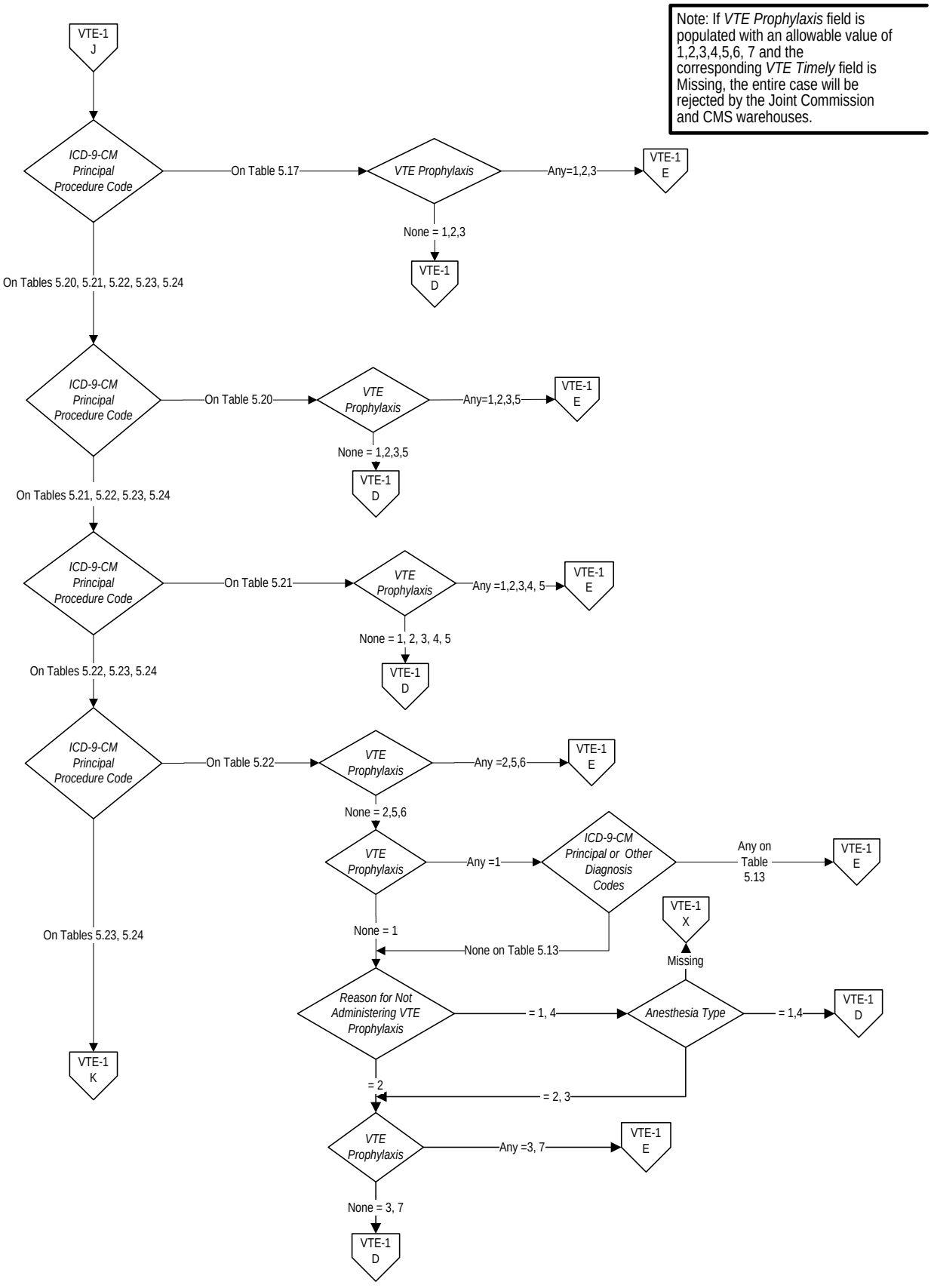
Denominator: All selected surgery patients.

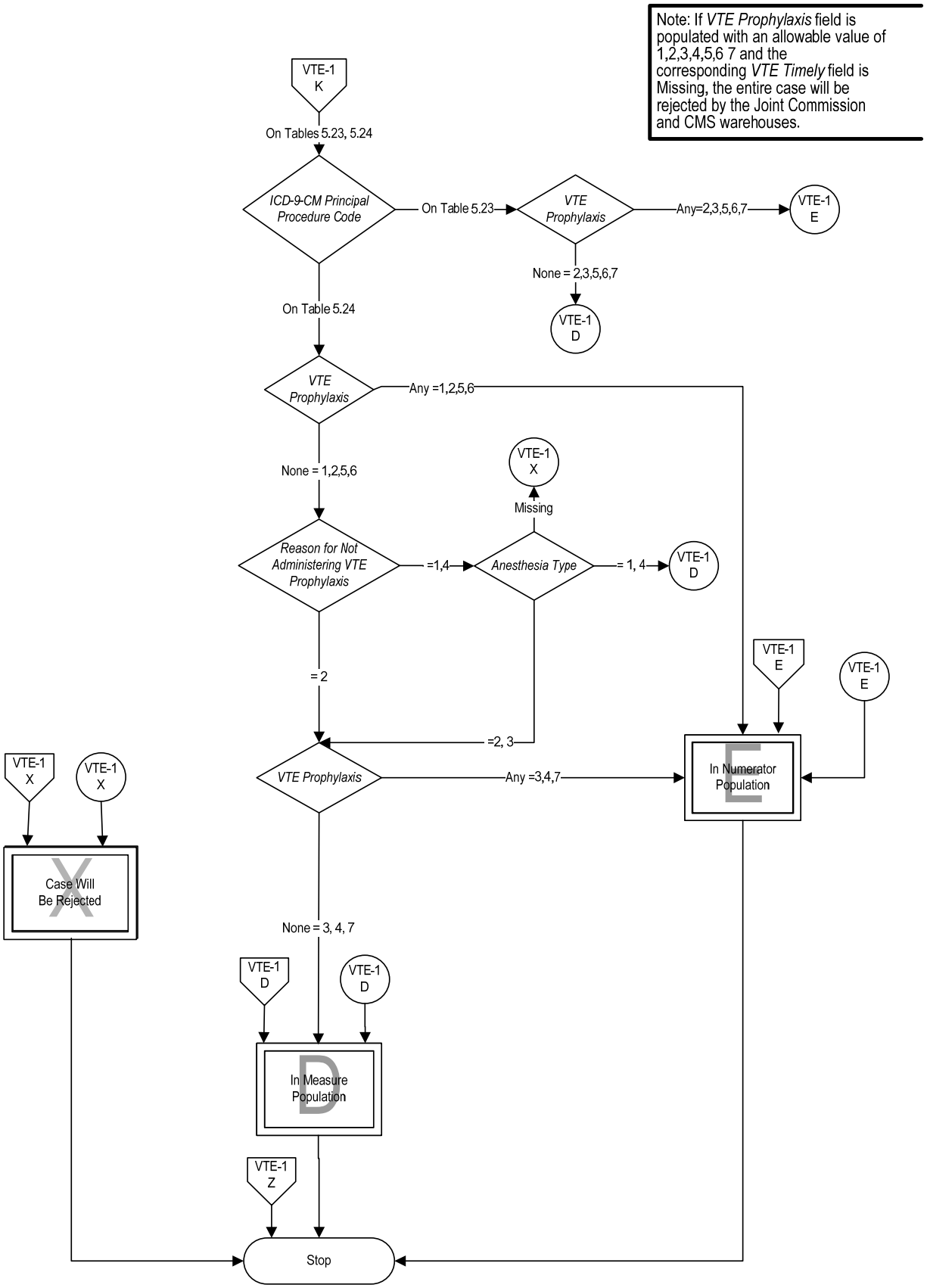
Variable Key:
Patient Age
LOS
Surgery Length
Surgery Days




VTE-1 H
Preadmission Warfarin
Missing
VTE-1 X
=Y
VTE-1 B
=N
Anesthesia Start Date
Missing
VTE-1 X
=UTD
VTE-1 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
VTE-1 B
≥ 0
Perioperative Death
Missing
VTE-1 X
=Y
VTE-1 B
= N
Anesthesia Start Time
Missing
VTE-1 X
=UTD
VTE-1 D
Non-UTD Value
Anesthesia End Date
Missing
VTE-1 X
=UTD
VTE-1 D
Non-UTD Value
Anesthesia End Time
Missing
VTE-1 X
=UTD
VTE-1 D
Non-UTD Value
Surgery Length = Anesthesia End Date and Anesthesia End Time - Anesthesia Start Date and Anesthesia Start Time (in minutes)
Surgery Length
≤ 60 minutes
VTE-1 B
> 60 minutes
VTE-1 I


Note: If VTE Prophylaxis field is populated with an allowable value of 1,2,3,4,5,6, 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by the Joint Commission and CMS warehouses.
VTE-1 I
VTE-1 B
Reason for Not Administering VTE Prophylaxis
Missing
VTE-1 X
=3
Not In Measure Population
D
VTE-1 Z
=1, 2, 4
VTE Prophylaxis
No values populated in VTE grid
VTE-1 X
=A
VTE-1 D
VTE grid populated with any of values 1, 2, 3, 4, 5, 6, 7
ICD-9-CM Principal Procedure Code
On Tables 5.17, 5.20, 5.21, 5.23
VTE-1 J
On Tables 5.19, 5.22, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.19
VTE Prophylaxis
Any = 1,2,5
VTE-1 E
None = 1,2,5
VTE-1 X
Missing
Reason for Not Administering VTE Prophylaxis
= 1, 4
Anesthesia Type
=1,4
VTE-1 D
On Tables 5.22 or 5.24
= 2
=2, 3
VTE Prophylaxis
Any =3,4
VTE-1 E
None = 3,4
VTE-1 J
VTE-1 D


Note: If VTE Prophylaxis field is populated with an allowable value of 1,2,3,4,5,6, 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by the Joint Commission and CMS warehouses.
VTE-1 J
ICD-9-CM Principal Procedure Code
On Table 5.17
VTE Prophylaxis
Any=1,2,3
VTE-1 E
None = 1,2,3
VTE-1 D
On Tables 5.20, 5.21, 5.22, 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.20
VTE Prophylaxis
Any=1,2,3,5
VTE-1 E
None = 1,2,3,5
VTE-1 D
On Tables 5.21, 5.22, 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.21
VTE Prophylaxis
Any =1,2,3,4, 5
VTE-1 E
None = 1, 2, 3, 4, 5
VTE-1 D
On Tables 5.22, 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.22
VTE Prophylaxis
Any =2,5,6
VTE-1 E
None = 2,5,6
VTE Prophylaxis
Any =1
ICD-9-CM Principal or Other Diagnosis Codes
Any on Table 5.13
VTE-1 E
None = 1
None on Table 5.13
VTE-1 X
Missing
On Tables 5.23, 5.24
Reason for Not Administering VTE Prophylaxis
= 1, 4
Anesthesia Type
= 1,4
VTE-1 D
VTE-1 K
= 2
= 2, 3
VTE Prophylaxis
Any =3, 7
VTE-1 E
None = 3, 7
VTE-1 D


Note: If VTE Prophylaxis field is populated with an allowable value of 1,2,3,4,5,6 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by the Joint Commission and CMS warehouses.
VTE-1 K
On Tables 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.23
VTE Prophylaxis
Any=2,3,5,6,7
VTE-1 E
None = 2,3,5,6,7
VTE-1 D
On Table 5.24
VTE Prophylaxis
Any =1,2,5,6
None = 1,2,5,6
VTE-1 X
Missing
Reason for Not Administering VTE Prophylaxis
=1,4
Anesthesia Type
= 1, 4
VTE-1 D
= 2
VTE-1 E
VTE-1 E
=2, 3
VTE Prophylaxis
Any =3,4,7
In Numerator Population
E
VTE-1 X
VTE-1 X
Case Will Be Rejected
X
None = 3, 4, 7
VTE-1 D
VTE-1 D
In Measure Population
D
VTE-1 Z
Stop

SCIP-Venous Thromboembolism (VTE)-1: Surgery patients with Recommended Venous Thromboembolism Prophylaxis Ordered

Numerator: Surgery patients with recommended Venous Thromboembolism (VTE) prophylaxis ordered anytime from hospital arrival to 24 hours after Anesthesia End Time.

Denominator: All selected surgery patients.

Variable Key: Patient Age, Length of Stay (LOS), Surgery Length, Surgery Days

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is not on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, 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 is on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and proceed to ICD-9-CM Principal Diagnosis Code.

5. Check ICD-9-CM Principal Diagnosis Code
   a. If the ICD-9-CM Principal Diagnosis Code is on Table 5.14, 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 5.14, continue processing and proceed to the LOS calculation.

6. Calculate LOS. LOS, in days, is equal to the Discharge Date minus the Admission Date

7. Check LOS
   a. If the LOS is less than 2 days, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Calculation. Stop processing.
   b. If the LOS is greater than or equal to 2 days, continue processing and proceed to Laparoscope.

8. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Laparoscope equals 1 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 Laparoscope equals 2, continue processing and proceed to Clinical Trial.

9. 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 Preadmission Warfarin.

10. Check Preadmission Warfarin
   a. If Preadmission Warfarin is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Preadmission Warfarin 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 Preadmission Warfarin equals No, continue processing and proceed to Anesthesia Start Date.

11. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If the Anesthesia Start 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 Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

12. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

13. Check Surgery Days
    a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Perioperative Death.

14. Check Perioperative Death
    a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Perioperative Death 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 Perioperative Death equals No, continue processing and proceed to Anesthesia Start Time.

15. Check Anesthesia Start Time
    a. If the Anesthesia Start Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia Start 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 the Anesthesia Start Time equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Date.

16. Check Anesthesia End Date
    a. If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia End 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 the Anesthesia End Date equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Time.

17. Check Anesthesia End Time
    a. If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If the Anesthesia End 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 the Anesthesia End Time equals a Non Unable to Determine Value, continue processing and proceed to the Surgery Length calculation.

18. Calculate Surgery Length. Surgery Length, in minutes, is equal to the Anesthesia End Date and Anesthesia End Time minus the Anesthesia Start Date and Anesthesia Start Time.

19. Check Surgery Length
    a. If the Surgery Length is less than or equal to 60 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 Surgery Length is greater than 60 minutes, continue processing proceed to Reason for Not Administering VTE Prophylaxis.

20. Check Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering 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 Not Administering VTE Prophylaxis equals 3, 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 Administering VTE Prophylaxis equals 1, 2, or 4, continue processing and proceed to VTE Prophylaxis.

21. Check VTE Prophylaxis
    a. If no values are populated in the VTE grid, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If VTE Prophylaxis equals A, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
    c. If the VTE grid is populated with any of values 1, 2, 3, 4, 5, 6, 7, continue processing and proceed to recheck the ICD-9-CM Principal Procedure Code. Note: If VTE Prophylaxis field is populated with an allowable value of 1, 2, 3, 4, 5, 6, 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by The Joint Commission and Centers for Medicare and Medicaid Services (CMS) warehouses.

22. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Tables 5.17, 5.20, 5.21, or 5.23, continue processing. Proceed to step 27 and recheck ICD-9-CM

Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24. Do not check steps 23 through 26 for ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 as steps 23 through 26 check for codes on Tables 5.19, 5.22, and 5.24 only.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.19, 5.22, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

23. Recheck ICD-9-CM Principal Procedure Code only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.20, 5.21 or 5.23
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.19, continue processing and recheck VTE Prophylaxis.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.22 or 5.24, continue processing. Proceed to step 27 and recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24. Do not recheck step 24 VTE Prophylaxis, step 25 Reason for Not Administering VTE Prophylaxis or step 26 Anesthesia Type.

24. Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.19
    a. If any VTE Prophylaxis equals 1, 2, or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
    b. If none of the VTE Prophylaxis equals 1, 2, or 5, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis.

25. Recheck Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and proceed to Anesthesia Type.
        1. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
        2. If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
        3. If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis.
    b. If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and recheck VTE Prophylaxis.

26. Recheck VTE Prophylaxis

a. If any VTE Prophylaxis equals 3 or 4, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
b. If none of the VTE Prophylaxis equals 3 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

27. Recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 only if ICD-9-CM Principal Procedure Code was not on Table 5.19
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.17, continue processing and recheck VTE Prophylaxis.
        1. If any VTE Prophylaxis equals 1, 2, or 3, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If none of the VTE Prophylaxis equals 1, 2, or 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

28. Recheck ICD-9-CM Principal Procedure Code for Tables 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code was not on Tables 5.17 or 5.19
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.20, continue processing and recheck VTE Prophylaxis.
        1. If any VTE Prophylaxis equals 1, 2, 3 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If none of the VTE Prophylaxis equals 1, 2, 3, or 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

29. Recheck ICD-9-CM Principal Procedure Code for Tables 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19 or 5.20.
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.21, continue processing and recheck VTE Prophylaxis.

1. If any VTE Prophylaxis equals 1, 2, 3, 4, or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
2. If none of the VTE Prophylaxis equals 1, 2, 3, 4, or 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

30. Recheck ICD-9-CM Principal Procedure Code for Tables 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20 or 5.21.
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.22, continue processing and recheck VTE Prophylaxis.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.23 or 5.24, continue processing. Proceed to step 35 and recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24. Do not recheck step 31, 32 and 34 VTE Prophylaxis or step 33 Reason for Not Administering VTE Prophylaxis.

31. Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.22
    a. If any VTE Prophylaxis equals 2, 5, 6, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
    b. If none of the VTE Prophylaxis equals 2, 5, 6, continue processing and proceed to recheck VTE Prophylaxis.

32. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 1, continue processing and check ICD-9-CM Principal or Other Diagnosis Codes.
        1. If any of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If none of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, continue processing and recheck Reason for Not Administering VTE Prophylaxis.
    b. If none of the VTE Prophylaxis equals 1, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis.

33. Recheck Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type.
        1. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
        2. If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
        3. If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis.
    b. If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis.

34. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 3 or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
    b. If none of the VTE Prophylaxis equals 3 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

35. Recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24 only if the ICD-9-CM Principal Procedure Code was not on Tables 5.17, 5.19, 5.20, 5.21, or 5.22.
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.23, continue processing and recheck VTE Prophylaxis.
        1. If Any VTE Prophylaxis is equal to 2, 3, 5, 6, 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If None of the VTE Prophylaxis is equal to 2, 3, 5, 6, 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.24, continue processing and recheck VTE Prophylaxis.

36. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 1, 2, 5, 6, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

b. If none of the VTE Prophylaxis equals 1, 2, 5, 6, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis.

37. Recheck Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type.
        1. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
        2. If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
        3. If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis.
    b. If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis.

38. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 3, 4, or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
    b. If none of the VTE Prophylaxis equals 3, 4, or 7, 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: Surgical Care Improvement Project (SCIP)

Set Measure ID#: SCIP-VTE-2

Performance Measure Name: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery

Description: Surgery patients who received appropriate Venous Thromboembolism (VTE) prophylaxis within 24 hours prior to *Anesthesia Start Time* to 24 hours after *Anesthesia End Time.*

Rationale: There are over 30 million surgeries performed in the United States each year. Despite the evidence that VTE is one of the most common postoperative complications and prophylaxis is the most effective strategy to reduce morbidity and mortality, it is often underused. The frequency of Venous Thromboembolism (VTE), that includes deep vein thrombosis and pulmonary embolism, is related to the type and duration of surgery, patient risk factors, duration and extent of postoperative immobilization, and use or nonuse of prophylaxis. According to Heit et al, 2000, surgery was associated with over a twenty-fold increase in the odds of being diagnosed with VTE. Studies have shown that appropriately used thromboprophylaxis has a positive risk/benefit ratio and is cost effective. Prophylaxis recommendations for this measure are based on selected surgical procedures from the 2008 American College of Chest Physicians guidelines.

Timing of prophylaxis is based on the type of procedure, prophylaxis selection, and clinical judgment regarding the impact of patient risk factors. The optimal start of pharmacologic prophylaxis in surgical patients varies and must be balanced with the efficacy-versus-bleeding potential. Due to the inherent variability related to the initiation of prophylaxis for surgical procedures, 24 hours prior to surgery to 24 hours post surgery was recommended by consensus of the SCIP Technical Expert Panel in order to establish a timeframe that would encompass most procedures.

Type of Measure: Process

Improvement Noted As: An increase in the rate

Numerator Statement: Surgery patients who received appropriate Venous Thromboembolism (VTE) prophylaxis within 24 hours prior to *Anesthesia Start Time* to 24 hours after *Anesthesia End Time.*

Included Populations: Not applicable

Excluded Populations: None

Data Elements:
- *Anesthesia Type*
- *VTE Prophylaxis*
- *VTE Timely*

Denominator Statement: All selected surgery patients

Included Populations:
- *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.10 for ICD-9-CM codes)

AND

- *ICD-9-CM Principal Procedure Code* of selected surgeries (as defined in Appendix A, Table 5.17-5.24 for ICD-9-CM codes)

Excluded Populations:
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Burn patients (as defined in Appendix A, Table 5.14 for ICD-9-CM codes)
- Patients with procedures performed entirely by *Laparoscope*
- Patients enrolled in clinical trials
- Patients who are on warfarin prior to admission
- Patients whose ICD-9-CM principal procedure occurred prior to the date of admission
- Patients whose total surgery time is less than or equal to 60 minutes
- Patients who stay less than two nights
- Patients who expire perioperatively
- Patients with reasons for not administering both mechanical and pharmacological prophylaxis
- Patients who did not receive *VTE Prophylaxis* (as defined in the Data Dictionary)

Data Elements:
- *Admission Date*
- *Anesthesia End Date*
- *Anesthesia End Time*
- *Anesthesia Start Date*
- *Anesthesia Start Time*
- *Birthdate*
- *Clinical Trial*
- *Discharge Date*

- *ICD-9-CM Principal Diagnosis Code*
- *ICD-9-CM Principal Procedure Code*
- *Laparoscope*
- *Perioperative Death*
- *Preadmission Warfarin*
- *Reason for Not Administering VTE Prophylaxis*

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: Measure rates for SCIP-VTE-2 should be analyzed in conjunction with SCIP-VTE-1 in order to identify focus areas for quality improvement. Low measure rates may indicate the need for staff education or evaluation of organizational factors and processes of care. Note that rates for SCIP-VTE- 2 may be lower than those for SCIP-VTE-1 as a result of more stringent criteria. SCIP-VTE-2 requires documentation that prophylaxis was ordered and actually started, whereas SCIP-VTE-1 requires only documentation of an order.

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:

- Chapter 31 of Making Healthcare Safer: A Critical Analysis of Patient Safety Practices. Prepared for Agency for Healthcare Research and Quality, Contract No. 290-97-0013. Prevention of Venous Thromboembolism. PMID: 00000.
- Anderson FA, Wheeler HB, Goldberg RJ, et al. Physician practices in the prevention of VTE. *Ann Intern Med*. 1991;115-591-595. PMID: 1892330.
- Geerts WH, Bergqvist D, Pineo GF, Heit JA, Samama CM, Lassen MR, Colwell CW. Prevention of venous thromboembolism. The Eighth ACCP Conference on antithrombotic and thrombolytic therapy. *Chest* 2008; 133:381S-453S. PMID: 18574271.
- Stratton MA, Anderson FA, Bussey HI, Caprini J. Prevention of venous thromboembolism: adherence to the 1995 American College of Chest Physicians Consensus Guidelines for Surgical Patients. *Arch Intern Med*. 2000;160:334-3. PMID: 10668835.
- Amarigiri SV, Lees TA. Elastic compression stockings for prevention of deep vein thrombosis. *The Cochrane Library*, Issue1, 2001. PMID: 10908501.
- Iorio A, Agnelli G. Low-molecular-weight and unfractionated heparin for prevention of venous thromboembolism in neurosurgery: a meta-analysis. *Arch Intern Med*. 2000;160:2327-2332. PMID: 10927730.

- Goldhaber SZ, Dunn K, MacDougall RC. New onset of venous thromboembolism among hospitalized patients at Brigham and Women's Hospital is caused more often by prophylaxis failure than by withholding treatment. *Chest*. 000;118:1680-1684. PMID: 11115458.
- O'Donnell M, Weitz JI. Thromboprophylaxis in surgical patients. *Can J Surg*. 2003; 46(2): 129-135. PMID: 12691354.
- Janku GV, Paiement GD, Green HD. Prevention of venous thromboembolism in orthopaedics in the United States. *Clin Ortho & Related Research*. 1996:313-321. PMID: 8998892.
- Koch A, Bouges S, Ziegler S, et al. Low molecular weight heparin and infractionated heparin in thrombosis prophylaxis after major surgical intervention: update of previous meta-analyses. *Br J Surg*. 1997;84:750-759. PMID: 9189079.
- Palmer AJ, Schramm W, Kirchhof B, et al. Low molecular weight heparin and unfractionated heparin for prevention of thrombo-embolism in general surgery: a meta-analysis of randomised clinical trials. *Haemostasis*. 1997;27:65-74. PMID: 9212354.
- Bratzler DW, Raskob GE, Murray CK, et al. Underuse of venous thromboembolism prophylaxis for general surgery patients: physician practices in the community hospital setting. *Arch Intern Med*. 1998;158:1909-1912. PMID: 9759687.
- Vanek VW. Meta-analysis of effectiveness of intermittent pneumatic compression devices with a comparison of thigh-high to knee-high sleeves. *American Surgeon*. 1998;64:1050-1058. PMID: 9798767.
- Hull RD, Brant RF, Pineo GF, et al. Preoperative vs postoperative initiation of low-molecular-weight heparin prophylaxis against venous thromboembolism in patients undergoing elective hip replacement. *Arch Intern Med*. 1999;159:137-141. PMID: 9927095.
- Raskob GE, Hirsh J. Controversies in timing of the first dose of anticoagulant prophylaxis against venous thromboembolism after major orthopedic surgery. *Chest*. 2003 Dec;124(6 Suppl):379S-385S.
- Heit JA, Silverstein MD, Mohr DN, Petterson TM, O'Fallon WM, Melton LJ, III. Risk factors for deep vein thrombosis and pulmonary embolism: a population-based case-control study. *Arch Intern Med* 2000;160:809-815.
- Abrams PJ, Emerson CR. Rivaroxaban: A Novel, Oral, Direct Factor Xa Inhibitor. *Pharmacotherapy.* February 2009:167-181.
- Borris LC, Rivaroxaban, A New, Oral Direct Factor Xa Inhibitor for Thromboprophylaxis after Major Joint Arthroplasty*. Expert Opinion on Pharmacotherapy.* 2009 Apr,10(6):1083-8.
- E*riksson B*I, *Kakkar A*K, Turpie AG, Gent M, Bandel TJ, Homering M, Misselwitz F, Lassen MR..Oral Rivaroxaban for the Prevention of symptomatic Venous Thromboembolism After Elective Hip and Knee Replacement. *Journal of Bone and Joint Surgery – British Volume.* Vol 91-B, Issue 5, 636-64.
- Turpie AG, Lassen MR, Davidson BL, et. Al. Rivaroxaban versus enoxaprin for thromboprophylaxis after total knee arthroplasty (RECORD4): a randomized trial. *The Lancet,* Volume 373, Issue 9676, Pages 1673-180, 16 May 2009.

VTE Prophylaxis Options for Surgery	
Surgery Type	**Recommended Prophylaxis Options[1]**
Intracranial Neurosurgery Appendix A, Table 5.17	Any of the following: • Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS) • Low-dose unfractionated heparin (LDUH) Low molecular weight heparin (LMWH)[2] • LDUH or LMWH[2] combined with IPC or GCS
General Surgery Appendix A, Table 5.19	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
General Surgery with a reason for not administering pharmacological prophylaxis Appendix A, Table 5.19	Any of the following: • Graduated Compression stockings (GCS) • Intermittent pneumatic compression devices (IPC)
Gynecologic Surgery Appendix A, Table 5.20	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (fondaparinux) • Intermittent pneumatic compression devices (IPC) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
Urologic Surgery Appendix A, Table 5.21	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (fondaparinux) • Intermittent pneumatic compression devices (IPC) • Graduated compression stockings (GCS) • LDUH or LMWH or Factor Xa Inhibitor (fondaparinux) combined with IPC or GCS
Elective Total Hip Replacement Appendix A, Table 5.22	Any of the following started within 24 hours of surgery: • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin

VTE Prophylaxis Options for Surgery	
Surgery Type	**Recommended Prophylaxis Options[1]**
Elective Total Knee Replacement Appendix A, Table 5.23	Any of the following: • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP)
Hip Fracture Surgery Appendix A, Table 5.24	Any of the following: • Low-dose unfractionated heparin (LDUH) • Low molecular weight heparin (LMWH) • Factor Xa Inhibitor (Fondaparinux) • Warfarin
Elective Total Hip Replacement with a reason for not administering pharmacological prophylaxis Appendix A, Table 5.22	Any of the following: • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP)
Hip Fracture Surgery with a reason for not administering pharmacological prophylaxis Appendix A, Table 5.24	Any of the following: • Graduated Compression Stockings (GCS) • Intermittent pneumatic compression devices (IPC) • Venous foot pump (VFP)

[1] Patients who receive neuraxial anesthesia or have a documented reason for not administering pharmacological prophylaxis may pass the performance measure if either appropriate pharmacological or mechanical prophylaxis is ordered.

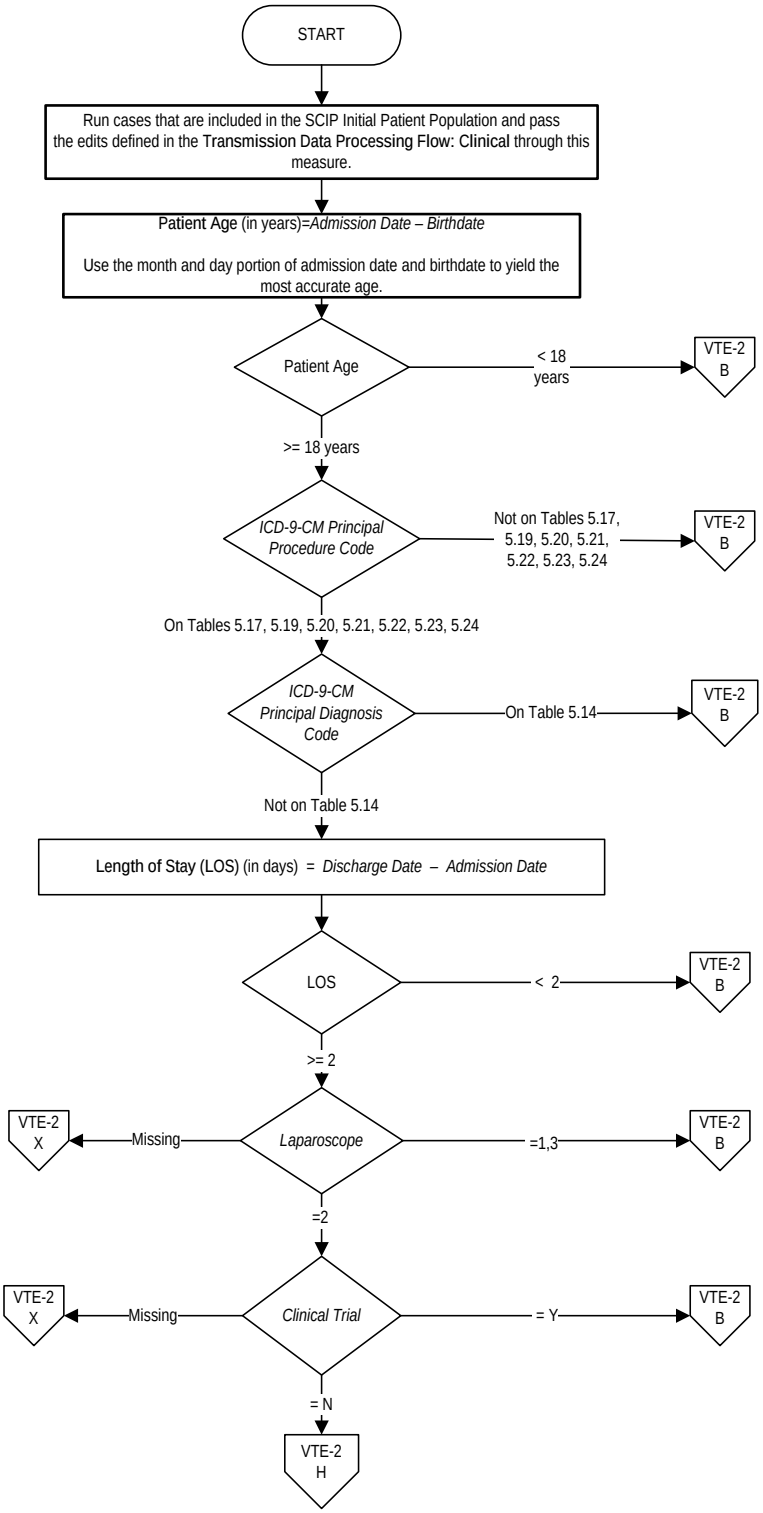
[2] Current guidelines recommend postoperative low molecular weight heparin for Intracranial Neurosurgery.

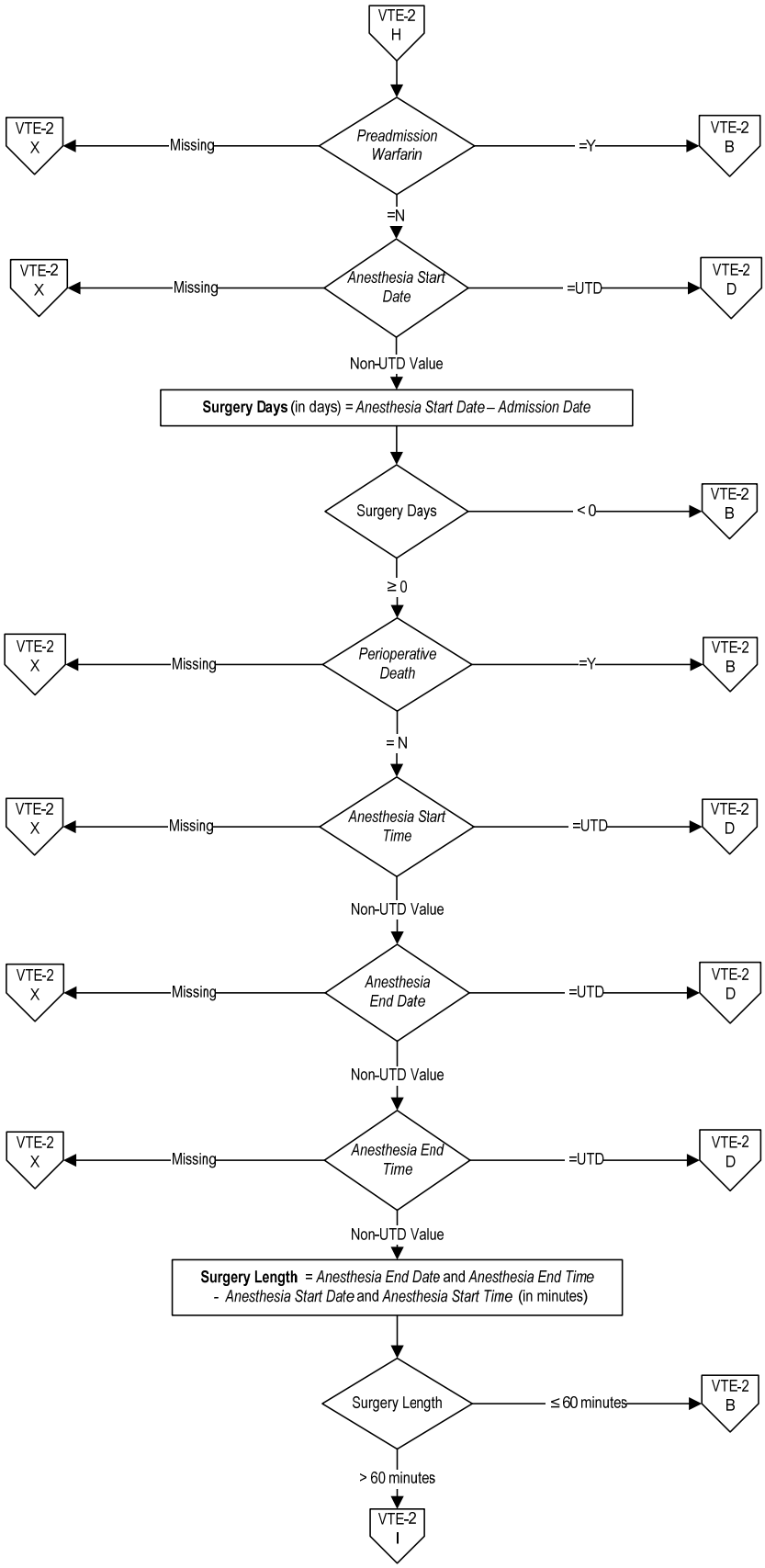
SCIP-VTE-2: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery

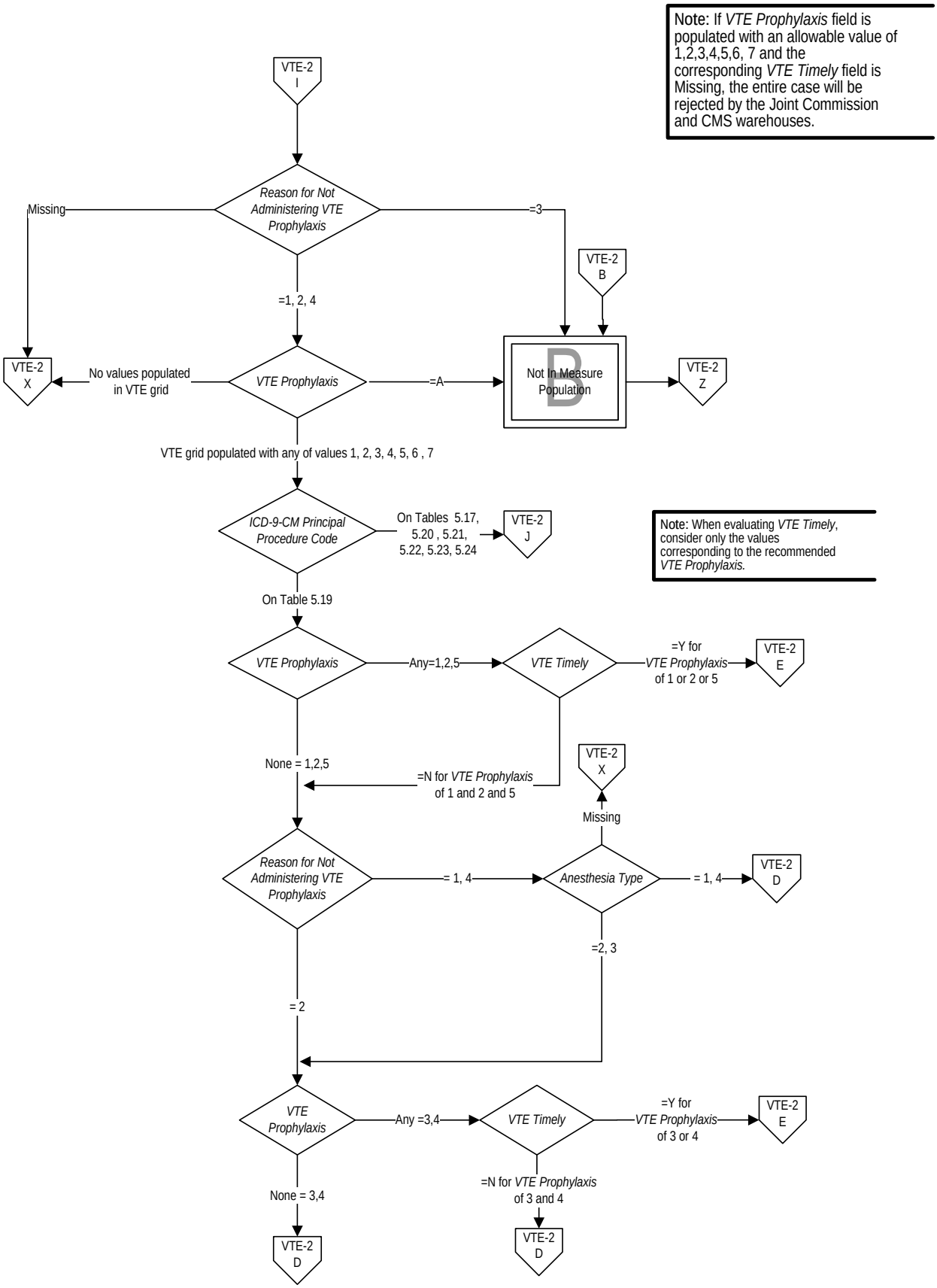
Numerator: Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis 24 hours prior to *Anesthesia Start Time* to 24 hours after *Anesthesia End Time.*

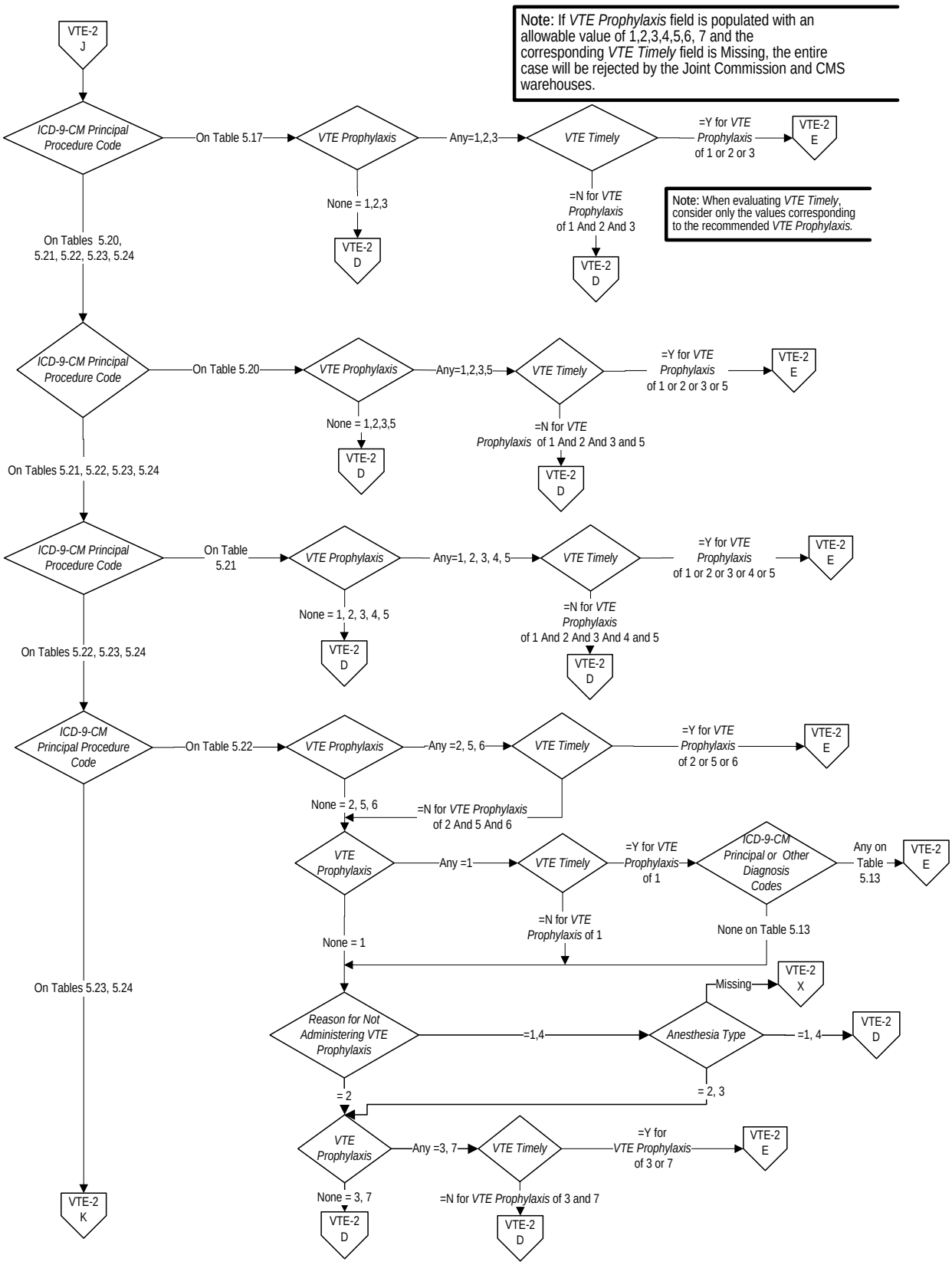
Denominator: All selected surgery patients.

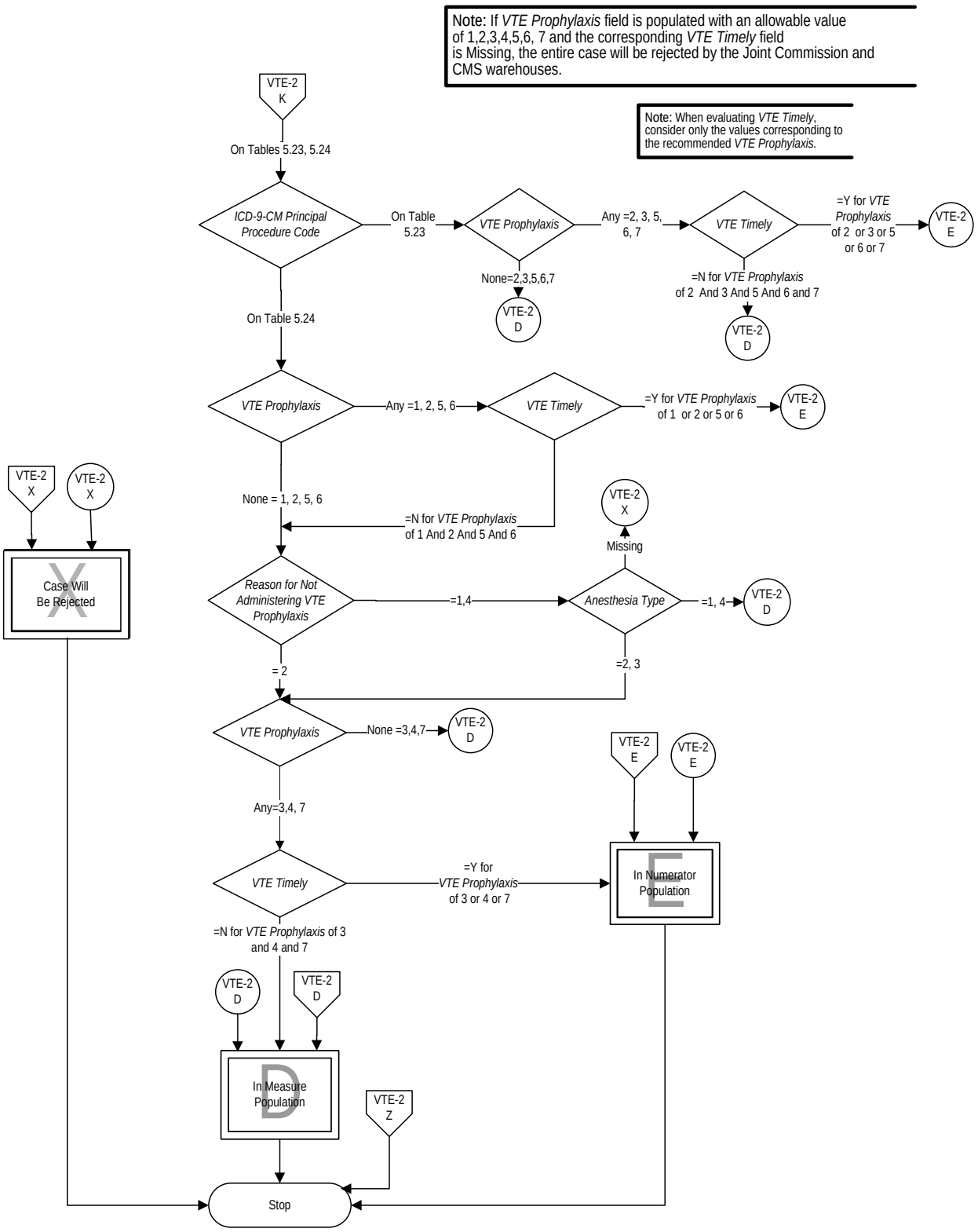
Variable Key:
Patient Age
LOS
Surgery Length
Surgery Days




VTE-2 H
Preadmission Warfarin
Missing
VTE-2 X
=Y
VTE-2 B
=N
Anesthesia Start Date
Missing
VTE-2 X
=UTD
VTE-2 D
Non-UTD Value
Surgery Days (in days) = Anesthesia Start Date – Admission Date
Surgery Days
< 0
VTE-2 B
≥ 0
Perioperative Death
Missing
VTE-2 X
=Y
VTE-2 B
= N
Anesthesia Start Time
Missing
VTE-2 X
=UTD
VTE-2 D
Non-UTD Value
Anesthesia End Date
Missing
VTE-2 X
=UTD
VTE-2 D
Non-UTD Value
Anesthesia End Time
Missing
VTE-2 X
=UTD
VTE-2 D
Non-UTD Value
Surgery Length = Anesthesia End Date and Anesthesia End Time - Anesthesia Start Date and Anesthesia Start Time (in minutes)
Surgery Length
≤ 60 minutes
VTE-2 B
> 60 minutes
VTE-2 I


Note: If VTE Prophylaxis field is populated with an allowable value of 1,2,3,4,5,6, 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by the Joint Commission and CMS warehouses.
VTE-2 I
Reason for Not Administering VTE Prophylaxis
Missing
=3
VTE-2 B
=1, 2, 4
VTE-2 X
No values populated in VTE grid
VTE Prophylaxis
=A
Not In Measure Population
D
VTE-2 Z
VTE grid populated with any of values 1, 2, 3, 4, 5, 6 , 7
ICD-9-CM Principal Procedure Code
On Tables 5.17, 5.20 , 5.21, 5.22, 5.23, 5.24
VTE-2 J
Note: When evaluating VTE Timely, consider only the values corresponding to the recommended VTE Prophylaxis.
On Table 5.19
VTE Prophylaxis
Any=1,2,5
VTE Timely
=Y for VTE Prophylaxis of 1 or 2 or 5
VTE-2 E
None = 1,2,5
=N for VTE Prophylaxis of 1 and 2 and 5
VTE-2 X
Missing
Reason for Not Administering VTE Prophylaxis
= 1, 4
Anesthesia Type
= 1, 4
VTE-2 D
=2, 3
= 2
VTE Prophylaxis
Any =3,4
VTE Timely
=Y for VTE Prophylaxis of 3 or 4
VTE-2 E
=N for VTE Prophylaxis of 3 and 4
None = 3,4
VTE-2 D
VTE-2 D


VTE-2 J
ICD-9-CM Principal Procedure Code
On Table 5.17
VTE Prophylaxis
Any=1,2,3
VTE Timely
=Y for VTE Prophylaxis of 1 or 2 or 3
VTE-2 E
None = 1,2,3
VTE-2 D
=N for VTE Prophylaxis of 1 And 2 And 3
VTE-2 D
Note: If VTE Prophylaxis field is populated with an allowable value of 1,2,3,4,5,6, 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by the Joint Commission and CMS warehouses.
Note: When evaluating VTE Timely, consider only the values corresponding to the recommended VTE Prophylaxis.
On Tables 5.20, 5.21, 5.22, 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.20
VTE Prophylaxis
Any=1,2,3,5
VTE Timely
=Y for VTE Prophylaxis of 1 or 2 or 3 or 5
VTE-2 E
None = 1,2,3,5
VTE-2 D
=N for VTE Prophylaxis of 1 And 2 And 3 and 5
VTE-2 D
On Tables 5.21, 5.22, 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.21
VTE Prophylaxis
Any=1, 2, 3, 4, 5
VTE Timely
=Y for VTE Prophylaxis of 1 or 2 or 3 or 4 or 5
VTE-2 E
None = 1, 2, 3, 4, 5
VTE-2 D
=N for VTE Prophylaxis of 1 And 2 And 3 And 4 and 5
VTE-2 D
On Tables 5.22, 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.22
VTE Prophylaxis
Any =2, 5, 6
VTE Timely
=Y for VTE Prophylaxis of 2 or 5 or 6
VTE-2 E
None = 2, 5, 6
=N for VTE Prophylaxis of 2 And 5 And 6
VTE Prophylaxis
Any =1
VTE Timely
=Y for VTE Prophylaxis of 1
ICD-9-CM Principal or Other Diagnosis Codes
Any on Table 5.13
VTE-2 E
None = 1
=N for VTE Prophylaxis of 1
None on Table 5.13
On Tables 5.23, 5.24
Missing
VTE-2 X
Reason for Not Administering VTE Prophylaxis
=1,4
Anesthesia Type
=1, 4
VTE-2 D
= 2
= 2, 3
VTE Prophylaxis
Any =3, 7
VTE Timely
=Y for VTE Prophylaxis of 3 or 7
VTE-2 E
None = 3, 7
VTE-2 D
=N for VTE Prophylaxis of 3 and 7
VTE-2 D
VTE-2 K


Note: If VTE Prophylaxis field is populated with an allowable value of 1,2,3,4,5,6, 7 and the corresponding VTE Timely field is Missing, the entire case will be rejected by the Joint Commission and CMS warehouses.
Note: When evaluating VTE Timely, consider only the values corresponding to the recommended VTE Prophylaxis.
VTE-2 K
On Tables 5.23, 5.24
ICD-9-CM Principal Procedure Code
On Table 5.23
VTE Prophylaxis
Any =2, 3, 5, 6, 7
VTE Timely
=Y for VTE Prophylaxis of 2 or 3 or 5 or 6 or 7
VTE-2 E
None=2,3,5,6,7
VTE-2 D
=N for VTE Prophylaxis of 2 And 3 And 5 And 6 and 7
VTE-2 D
On Table 5.24
VTE Prophylaxis
Any =1, 2, 5, 6
VTE Timely
=Y for VTE Prophylaxis of 1 or 2 or 5 or 6
VTE-2 E
VTE-2 X
VTE-2 X
None = 1, 2, 5, 6
=N for VTE Prophylaxis of 1 And 2 And 5 And 6
VTE-2 X
Missing
Case Will Be Rejected
X
Reason for Not Administering VTE Prophylaxis
=1,4
Anesthesia Type
=1, 4
VTE-2 D
= 2
=2, 3
VTE Prophylaxis
None =3,4,7
VTE-2 D
VTE-2 E
VTE-2 E
Any=3,4, 7
VTE Timely
=Y for VTE Prophylaxis of 3 or 4 or 7
In Numerator Population
E
=N for VTE Prophylaxis of 3 and 4 and 7
VTE-2 D
VTE-2 D
In Measure Population
D
VTE-2 Z
Stop

SCIP- Venous Thromboembolism (VTE)-2: Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery

Numerator: Surgery patients who received Venous Thromboembolism (VTE) prophylaxis 24 hours prior to Anesthesia Start Time to 24 hours after Anesthesia End Time.

Denominator: All selected surgery patients

Variable Key: Patient Age, Length of Stay (LOS), Surgery Length, Surgery Days

1. Start processing. Run cases that are included in the Surgical Care Improvement Project (SCIP) Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.

2. Calculate Patient Age. The 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.

3. Check Patient Age
   a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
   b. If Patient Age is greater than or equal to 18 years, continue processing and proceed to ICD-9-CM Principal Procedure Code.

4. Check ICD-9-CM Principal Procedure Code
   a. If the ICD-9-CM Principal Procedure Code is not on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, 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 is on Table 5.17, 5.19, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and proceed to ICD-9-CM Principal Diagnosis Code.

5. Check ICD-9-CM Principal Diagnosis Code
   a. If the ICD-9-CM Principal Diagnosis Code is on Table 5.14, 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 5.14, continue processing and proceed to the LOS calculation.

6. Calculate LOS. LOS, in days, is equal to the Discharge Date minus the Admission Date.

7. Check LOS
   a. If the LOS is less than 2 days, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Calculation. Stop processing.
   b. If the LOS is greater than or equal to 2 days, continue processing and proceed to Laparoscope.

8. Check Laparoscope
   a. If Laparoscope is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Laparoscope equals 1 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 Laparoscope equals 2, continue processing and proceed to Clinical Trial.

9. 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 Preadmission Warfarin.

10. Check Preadmission Warfarin
   a. If Preadmission Warfarin is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
   b. If Preadmission Warfarin 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 Preadmission Warfarin equals No, continue processing and proceed to Anesthesia Start Date.

11. Check Anesthesia Start Date
   a. If the Anesthesia Start Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

b. If the Anesthesia Start 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 Anesthesia Start Date equals a Non Unable To Determine Value, continue processing and proceed to the Surgery Days calculation.

12. Calculate Surgery Days. Surgery Days, in days, is equal to the Anesthesia Start Date minus the Admission Date.

13. Check Surgery Days
    a. If the Surgery Days is less than 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 Surgery Days is greater than or equal to zero, continue processing and proceed to Perioperative Death.

14. Check Perioperative Death
    a. If Perioperative Death is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If Perioperative Death 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 Perioperative Death equals No, continue processing and proceed to Anesthesia Start Time.

15. Check Anesthesia Start Time
    a. If the Anesthesia Start Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia Start 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 the Anesthesia Start Time equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Date.

16. Check Anesthesia End Date
    a. If the Anesthesia End Date is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia End 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 the Anesthesia End Date equals a Non Unable to Determine Value, continue processing and proceed to Anesthesia End Time.

17. Check Anesthesia End Time
    a. If the Anesthesia End Time is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If the Anesthesia End 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 the Anesthesia End Time equals a Non Unable to Determine Value, continue processing and proceed to the Surgery Length calculation.

18. Calculate Surgery Length. Surgery Length, in minutes, is equal to the Anesthesia End Date and Anesthesia End Time minus the Anesthesia Start Date and Anesthesia Start Time.

19. Check Surgery Length
    a. If the Surgery Length is less than or equal to 60 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 Surgery Length is greater than 60 minutes, continue processing proceed to Reason for Not Administering VTE Prophylaxis.

20. Check Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering 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 Not Administering VTE Prophylaxis equals 3, 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 Administering VTE Prophylaxis equals 1, 2, or 4, continue processing and proceed to VTE Prophylaxis.

21. Check VTE Prophylaxis
    a. If no values are populated in the VTE grid, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
    b. If VTE Prophylaxis equals A, the case will proceed to a Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
    c. If the VTE grid is populated with any of values 1, 2, 3, 4, 5, 6, 7, continue processing and proceed to recheck the ICD-9-CM Principal Procedure Code. Note: If VTE Prophylaxis field is populated with an allowable value of 1, 2, 3, 4, 5, 6, 7and the corresponding VTE Timely field is Missing, the entire case will be rejected by The Joint Commission and Centers for Medicare and Medicaid Services (CMS) warehouses.

22. Recheck ICD-9-CM Principal Procedure Code
    a. If the ICD-9-CM Principal Procedure Code is on Tables 5.17, 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing. Proceed to step 26 and recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24. Do not recheck step 23 and step 25 VTE Prophylaxis or step 24 Reason for Not Administering VTE Prophylaxis for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 as steps 23 through 26 check for codes on Table 5.19 only.
    b. If the ICD-9-CM Principal Procedure Code is on Table 5.19, continue processing and recheck VTE Prophylaxis.

23. Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.19
    a. If any VTE Prophylaxis equals 1, 2, or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.
        1. If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 5, continue processing and recheck Reason for Not Administering VTE Prophylaxis.
    b. If none of the VTE Prophylaxis equals 1, 2, or 5, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis.

24. Recheck Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and proceed to Anesthesia Type.
        1. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
        2. If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
        3. If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis.
    b. If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and recheck VTE Prophylaxis.

25. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 3 or 4, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.

1. If VTE Timely equals Yes for VTE Prophylaxis of 3 or 4, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
2. If VTE Timely equals No for VTE Prophylaxis of 3 and 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If none of the VTE Prophylaxis equals 3 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

26. Recheck ICD-9-CM Principal Procedure Code for Tables 5.17, 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code was not on Table 5.19

a. If the ICD-9-CM Principal Procedure Code is on Table 5.17, continue processing and recheck VTE Prophylaxis.

1. If any VTE Prophylaxis equals 1, 2, or 3, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.
   i. If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
   ii. If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
2. If none of the VTE Prophylaxis equals 1, 2, or 3, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.20, 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

27. Recheck ICD-9-CM Principal Procedure Code for Tables 5.20, 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17 or 5.19.

a. If the ICD-9-CM Principal Procedure Code is on Table 5.20, continue processing and recheck VTE Prophylaxis.

1. If any VTE Prophylaxis equals 1, 2, 3 or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.

i. If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

ii. If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3 and 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

2. If none of the VTE Prophylaxis equals 1, 2, 3, or 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.21, 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

28. Recheck ICD-9-CM Principal Procedure Code for Tables 5.21, 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, or 5.20.

a. If the ICD-9-CM Principal Procedure Code is on Table 5.21, continue processing and recheck VTE Prophylaxis.

1. If any VTE Prophylaxis equals 1, 2, 3, 4, or 5, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.

i. If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 3 or 4 or 5, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

ii. If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 3 and 4 and 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

2. If none of the VTE Prophylaxis equals 1, 2, 3, 4, or 5, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Tables 5.22, 5.23, or 5.24, continue processing and recheck ICD-9-CM Principal Procedure Code.

29. Recheck ICD-9-CM Principal Procedure Code for Tables 5.22, 5.23, and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20, or 5.21.
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.22, continue processing and recheck VTE Prophylaxis.
    b. If the ICD-9-CM Principal Procedure Code is on Tables 5.23 or 5.24, continue processing. Proceed to step 34 and recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24. Do not recheck steps 30, 31 and 33 VTE Prophylaxis or step 32 Reason for Not Administering VTE Prophylaxis.

30. Recheck VTE Prophylaxis only if the ICD-9-CM Principal Procedure Code is on Table 5.22
    a. If any VTE Prophylaxis equals 2, 5, 6, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.
        1. If VTE Timely equals Yes for VTE Prophylaxis of 2 or 5 or 6, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If VTE Timely equals No for VTE Prophylaxis of 2 and 5 and 6, continue processing and recheck VTE Prophylaxis.
    b. If none of the VTE Prophylaxis equals 2, 5, 6, continue processing and proceed to recheck VTE Prophylaxis.

31. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 1, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.
        1. If VTE Timely equals Yes for VTE Prophylaxis of 1, continue processing and check ICD-9-CM Principal or Other Diagnosis Codes.
            i. If any of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
            ii. If none of the ICD-9-CM Principal or Other Diagnosis Codes is on Table 5.13, continue processing and recheck Reason for Not Administering VTE Prophylaxis.
        2. If VTE Timely equals No for VTE Prophylaxis of 1, continue processing and recheck Reason for Not Administering VTE Prophylaxis.

b. If none of the VTE Prophylaxis equals 1, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis.

32. Recheck Reason for Not Administering VTE Prophylaxis
    a. If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type.
        1. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.
        2. If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
        3. If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis.
    b. If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis.

33. Recheck VTE Prophylaxis
    a. If any VTE Prophylaxis equals 3 or 7, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.
        1. If VTE Timely equals Yes for VTE Prophylaxis of 3 or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
        2. If VTE Timely equals No for VTE Prophylaxis of 3 and 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.
    b. If none of the VTE Prophylaxis equals 3 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

34. Recheck ICD-9-CM Principal Procedure Code for Tables 5.23 and 5.24 only if the ICD-9-CM Principal Procedure Code is not on Tables 5.17, 5.19, 5.20, 5.21, or 5.22.
    a. If the ICD-9-CM Principal Procedure Code is on Table 5.23, continue processing and recheck VTE Prophylaxis.
        1. If Any VTE Prophylaxis is equal to 2, 3, 5, 6, 7, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.
            i. If VTE Timely equals Yes for VTE Prophylaxis of 2 or 3 or 5 or 6 or 7, the case will proceed to a Measure Category

Assignment of E and will be in the Numerator Population. Stop processing.

ii. If VTE Timely equals No for VTE Prophylaxis of 2 and 3 and 5 and 6 and 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

2. If none of the VTE Prophylaxis is equal to 2, 3, 5, 6, 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If the ICD-9-CM Principal Procedure Code is on Table 5.24, continue processing and recheck VTE Prophylaxis.

35. Recheck VTE Prophylaxis

a. If any VTE Prophylaxis equals 1, 2, 5, 6, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.

1. If VTE Timely equals Yes for VTE Prophylaxis of 1 or 2 or 5 or 6, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

2. If VTE Timely equals No for VTE Prophylaxis of 1 and 2 and 5 and 6, continue processing and recheck Reason for Not Administering VTE Prophylaxis.

b. If none of the VTE Prophylaxis equals 1, 2, 5, 6, continue processing and proceed to recheck Reason for Not Administering VTE Prophylaxis.

36. Recheck Reason for Not Administering VTE Prophylaxis

a. If Reason for Not Administering VTE Prophylaxis equals 1 or 4, continue processing and recheck Anesthesia Type.

1. If Anesthesia Type is missing, the case will proceed to a Measure Category Assignment of X and will be rejected. Stop processing.

2. If Anesthesia Type equals 1 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

3. If Anesthesia Type equals 2 or 3, continue processing and recheck VTE Prophylaxis.

b. If Reason for Not Administering VTE Prophylaxis equals 2, continue processing and proceed to recheck VTE Prophylaxis.

37. Recheck VTE Prophylaxis

a. If none of the VTE Prophylaxis equals 3, 4, or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.

b. If any VTE Prophylaxis equals 3, 4, or 7, continue processing and check VTE Timely. Note: When evaluating VTE Timely consider only the values corresponding to the recommended VTE Prophylaxis.

1. If VTE Timely equals Yes for VTE Prophylaxis of 3 or 4 or 7, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
2. If VTE Timely equals No for VTE Prophylaxis of 3 or 4 or 7, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population. Stop processing.