Release Notes:
Measure Information Form
Version 2.6

****NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE****

Measure Information Form

Measure Set: Pneumonia (PN)

Performance Measure Identifier:

Organization	Set Measure ID#	Measure Population
CMS	PN-6	ICU & Non - ICU Patients
The Joint Commission	PN-6a	ICU Patients
The Joint Commission	PN-6b	Non - ICU Patients

Note: CMS data is transmitted as patient level data while the Joint Commission's data is transmitted as aggregate level data. Therefore, in order for The Joint Commission to distinguish between ICU and non-ICU patients, two separate measures are required for data transmission.

Performance Measure Name:
(PN-6) Initial Antibiotic Selection for Community-Acquired Pneumonia (CAP) in Immunocompetent Patients
(PN-6a) Initial Antibiotic Selection for Community-Acquired Pneumonia (CAP) in Immunocompetent Patients – Intensive Care Unit (ICU) Patients
(PN-6b) Initial Antibiotic Selection for Community-Acquired Pneumonia (CAP) in Immunocompetent Patients – Non ICU Patients

Description:
(PN-6) Immunocompetent patients with Community-Acquired Pneumonia who receive an initial antibiotic regimen during the first 24 hours that is consistent with current guidelines
(PN-6a) Immunocompetent ICU patients with Community-Acquired Pneumonia who receive an initial antibiotic regimen during the first 24 hours that is consistent with current guidelines
(PN-6b) Immunocompetent non-Intensive Care Unit (ICU) patients with Community-Acquired Pneumonia who receive an initial antibiotic regimen during the first 24 hours that is consistent with current guidelines

Rationale: The current North American antibiotic guidelines for Community-Acquired Pneumonia in immunocompetent patients are from the Centers for Disease Control and Prevention (CDC), the Infectious Diseases Society of America (IDSA), the Canadian Infectious Disease Society / Canadian Thoracic Society (CIDS/CTS), and the American Thoracic Society (ATS). All four reflect that *Streptococcus pneumoniae* is the most common cause of CAP, that treatment that covers "atypical" pathogens (e.g., Legionella species, *Chlamydia pneumoniae*,

Mycoplasma pneumoniae) can be associated with improved survival, and that the prevalence of antibiotic resistant *S. pneumoniae* is increasing.

The CMS convened a conference of guideline authors, including Julie Gerberding, MD (CDC), John Bartlett, MD (IDSA), Ronald Grossman, MD (CIDS/CTS), and Michael Niederman, MD (ATS), to reach consensus on the antibiotic regimens that could be considered consistent with all four organizations' guidelines. These regimens are reflected in this measure, and in the Pneumonia Antibiotic Consensus Recommendation located directly behind the measure information form.

Type of Measure: Process

Improvement Noted As: An increase in the rate/score/number of occurrences

Numerator Statement: Pneumonia patients who received an initial antibiotic regimen (as specified under the Set Measure Identifier and description above) consistent with current guidelines during the first 24 hours of their hospitalization

	PN-6	**PN-6a**	**PN-6b**
Included populations	Pneumonia patients who received antibiotics consistent with current guidelines	ICU pneumonia patients who received antibiotics consistent with current guidelines	Non-ICU pneumonia patients who received antibiotics consistent with current guidelines
Excluded Populations	None	None	None
Data Elements	*Antibiotic Administration Date* *Antibiotic Administration Route* *Antibiotic Administration Time* *Antibiotic Allergy* *Antibiotic Name* *Arrival Date* *Arrival Time* *Pseudomonas Risk* *Risk Factors for Drug-Resistant Pneumococcus*	*Antibiotic Administration Date* *Antibiotic Administration Route* *Antibiotic Administration Time* *Antibiotic Allergy* *Antibiotic Name* *Arrival Date* *Arrival Time* *Pseudomonas Risk*	*Antibiotic Administration Date* *Antibiotic Administration Route* *Antibiotic Administration Time* *Antibiotic Allergy* *Antibiotic Name* *Arrival Date* *Arrival Time* *Pseudomonas Risk* *Risk Factors for Drug-Resistant Pneumococcus*

Denominator Statement: Pneumonia patients (as specified under the Set Measure Identifier and description above) 18 years of age and older

Included Populations: Discharges with:

- An *ICD-9-CM Principal Diagnosis Code* of pneumonia as defined in Appendix A, Table 3.1 OR *ICD-9-CM Principal Diagnosis Code* of septicemia or respiratory failure (acute or chronic) as defined in Appendix A, Tables 3.2, or 3.3
  AND
- An *ICD-9-CM Other Diagnosis Code* of pneumonia (Appendix A, Table 3.1)

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay >120 days
- Patients with Cystic Fibrosis (Appendix A, Table 3.4)
- Patients who had no chest x-ray or CT scan that indicated abnormal findings within 24 hours prior to hospital arrival or anytime during this hospitalization
- Patients with *Comfort Measures Only* documented on day of or day after arrival
- Patients enrolled in clinical trials
- Patients received as a transfer from the emergency department of another hospital
- Patients received as a transfer from an acute care facility where they were an inpatient or outpatient
- Patients received as a transfer from one distinct unit of the hospital to another distinct unit of the same hospital
- Patients received as a transfer from an ambulatory surgery center
- Patients who have no diagnosis of pneumonia either as the ED final diagnosis/impression or direct admission diagnosis/impression
- PN patients not in the ICU (PN-6a only)
- PN patients in ICU (PN-6b only)
- Patients with an *Identified Pathogen* as defined in the Data Dictionary
- Patients with *Healthcare Associated PN* as defined in the Data Dictionary
- Patients who are *Compromised* as defined in the Data Dictionary
- Patients who only received antibiotics prior to hospital arrival
- Patients who do not receive any antibiotics within 24 hours after arrival.
- Patients discharged/transferred to another hospital for inpatient care on day of or day after arrival
- Patients who left against medical advice or discontinued care on day of or day after arrival
- Patients who expired on day of or day after arrival
- Patients discharged/transferred to a federal health care facility on day of or day after arrival
- Pneumonia patients with another suspected source of infection who did not receive an antibiotic regimen recommended for pneumonia, but did receive antibiotics within the first 24 hours of hospitalization

Data Elements:

- *Admission Date*
- *Another Suspected Source of Infection*
- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Antibiotic Name*
- *Antibiotic Received*
- *Birthdate*
- *Chest X-Ray*
- *Clinical Trial*

- *Comfort Measures Only*
- *Compromised*
- *Discharge Date*
- *Discharge Status*
- *Healthcare Associated PN*
- *ICD-9-CM Other Diagnosis Codes*
- *ICD-9-CM Principal Diagnosis Code*
- *ICU Transfer or Admission Within First 24 Hours*
- *Identified Pathogen*
- *Pneumonia Diagnosis: ED/Direct Admit*
- *Point of Origin for Admission or Visit*
- *Risk Factors for Drug-Resistant Pneumococcus* (PN-6 and PN-6b only)
- *Transfer From Another ED*

Risk Adjustment: No

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

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

Measure Analysis Suggestions:
The time of antibiotic administration is critical to this measure. For quality improvement purposes, the measurement system may want to create reports to identify patients who received their antibiotic consistent with guidelines but greater than 24 hours from the time of arrival, and patients who did not receive an antibiotic consistent with guidelines. This will allow healthcare organizations to direct education effort in the appropriate direction (i.e., appropriate antibiotic selection, or timing of administration).

Sampling: Yes, 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:

- Butler JC, Hofmann J, Cetron MS, et al. The continued emergence of drug-resistant Streptococcus pneumonia in the United States: an update from the Centers for Disease Control and Prevention's Pneumococcal Sentinel Surveillance System. *J Infect Dis.* 1996;174:986-993.

- Fine MJ, Smith MA, Carson CA, et al. Prognosis and outcomes of patients with community-acquired pneumonia. *JAMA.* 1996;275:134-141.
- Gleason PP, Meehan TP, Fine JM, et al. Associations between initial antimicrobial regimens and medical outcomes for elderly patients with pneumonia. *Arch Intern Med.* 1999;159:2562-2572.
- Heffelfinger JD, Dowell SF, Jorgensen JH, Klugman KP, et al. Management of Community-Acquired Pneumonia in the era of pneumococcal resistance: A Report From the Drug-Resistant Streptococcus pneumoniae Therapeutic Working Group. Archives of Internal Medicine. 2000, 160:1399-1408.
- Houck PM, MacLehose RF, Niederman MS, Lowery JK. Empiric antibiotic therapy and mortality among Medicare pneumonia inpatients in 10 western states, 1993, 1995, and 1997. *Chest*. 2001;119;1420-1426.
- Mandell LA, Marrie TJ, Grossman RF, et al. Canadian guidelines for the initial management of community-acquired pneumonia: an evidence-based update by the Canadian Infectious Disease Society and the Canadian Thoracic Society. *Clin Infect Dis.* 2000;31:383-421.
- Mandell LA, Wunderink RG, Anzueta A, Bartlett JG, Infectious Diseases Society of America; American Thoracic Society. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clin Infect Dis.* 2007 March 1;44 Suppl 2:S27-72.

Release Notes:
Pneumonia Antibiotic Consensus Recommendations Table
Version 2.3

Pneumonia Antibiotic Consensus Recommendations

Non-ICU Patient	ICU Patient	Pseudomonal Risk
β-lactam (IV or IM) Table 2.3 + **Macrolide (IV or oral)** Table 2.5 Or **Antipneumococcal Quinolone monotherapy (IV or oral)** Table 2.9 Or **β-lactam (IV or IM)** Table 2.3 + **Doxycycline (IV or oral)** Table 2.10 Or If less than 65 with no *Risk Factors for Drug-Resistant Pneumococcus* (see data element) Macrolide monotherapy (IV or oral) Table 2.5 β-lactam = Ceftriaxone, Cefotaxime, Ampicillin/Sulbactam, Ertapenem Macrolide = Erythromycin, Clarithromycin, Azithromycin Antipneumococcal Quinolones = Levofloxacin**, Moxifloxacin, Gemifloxacin	**β-lactam (IV)** Table 2.16 + **Macrolide (IV)** Table 2.6 Or **β-lactam (IV)** Table 2.16 + **Antipneumococcal Quinolone (IV)** Table 2.14 Or **If documented β-lactam allergy: Antipneumococcal Quinolone (IV)** Table 2.14 + **Aztreonam (IV)** Table 2.7 β-lactam = Ceftriaxone, Cefotaxime, Ampicillin/Sulbactam, Macrolide = Erythromycin, Azithromycin Antipneumococcal Quinolones = Levofloxacin**, Moxifloxacin	These antibiotics would also be acceptable for ICU and Non-ICU patients with Pseudomonal Risk **Antipseudomonal β-lactam (IV)** Table 2.4 + **Antipseudomonal Quinolone (IV)** Table 2.8 (PO Quinolone is allowed for Non-ICU only) Or **Antipseudomonal β-lactam (IV)** Table 2.4 + **Aminoglycoside (IV)** Table 2.11 + either **Antipneumococcal Quinolone (IV)** Table 2.14 Or **Macrolide (IV)** Table 2.6 (PO Quinolone is allowed for Non-ICU only Table 2.9) Or **If documented β-lactam allergy: Aztreonam (IV)** Table 2.7 + **Antipneumococcal Quinolone (IV)** Table 2.14 + **Aminoglycoside (IV)** Table 2.11 (PO Quinolone is allowed for Non-ICU only Table 2.9) ***Aztreonam (IV)** Table 2.7 + **Levofloxacin** (IV or oral)** Table 2.17 Antipseudomonal Quinolone = Ciprofloxacin, Levofloxacin** Antipseudomonal β-lactam = Cefepime, Imipenem, Meropenem, Piperacillin/Tazobactam, Doripenem Aminoglycoside = Gentamicin, Tobramycin, Amikacin Antipneumococcal Quinolone = Levofloxacin**, Moxifloxacin Macrolide = Azithromycin, Erythromycin

Data collected by the CMS National Pneumonia Project indicate that 78% of Medicare pneumonia patients who were hospitalized during 1998-99 received antibiotics that were consistent with guidelines published at that time. Among the states and territories this ranged from 55% to 87%. Compliance was lower among ICU patients, largely because atypical pathogen coverage was generally not common, but was only recommended for ICU patients. Subsequent revisions have made such coverage recommended for all inpatients.

**Levofloxacin should be used in 750mg dosage when used in the management of patients with pneumonia.

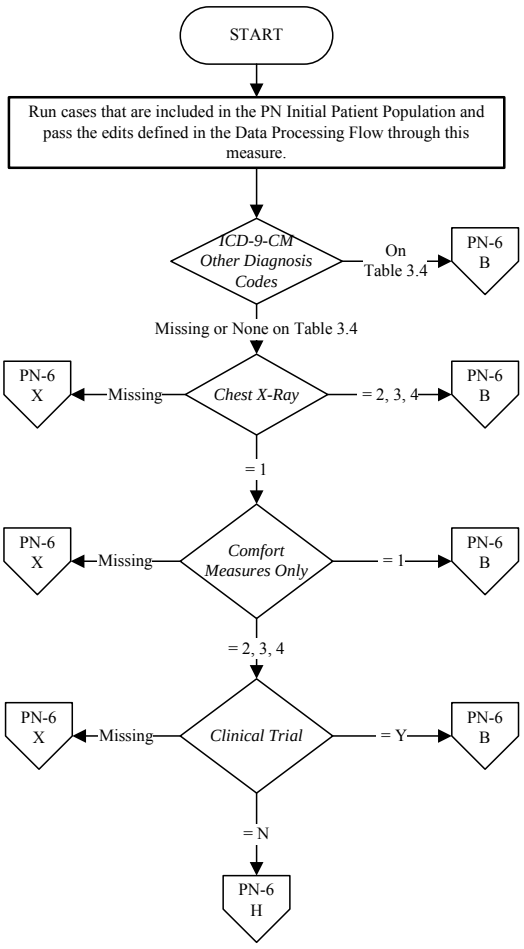
*** For patients with renal insufficiency

Note: The dosage listed is specified to reflect clinical expert recommendations. We do not collect dosage information for the purposes of the Pneumonia Project.

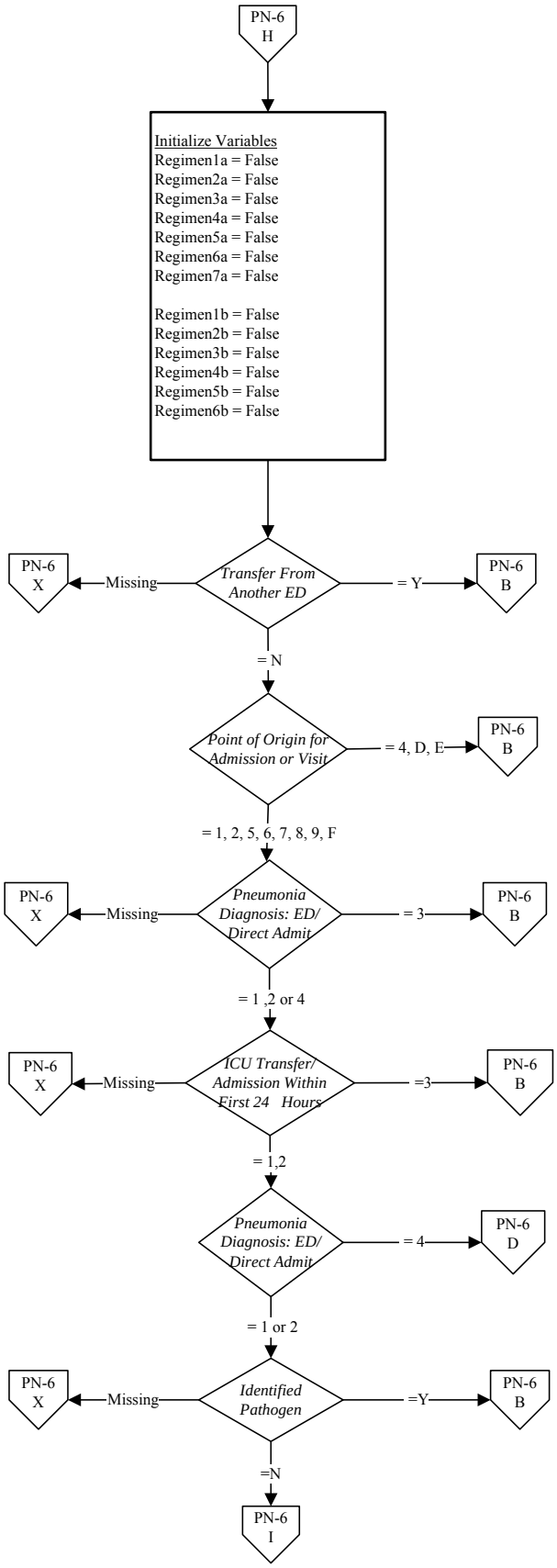
PN-6: Initial Antibiotic Selection for Community-Acquired Pneumonia (CAP) in Immunocompetent Patients

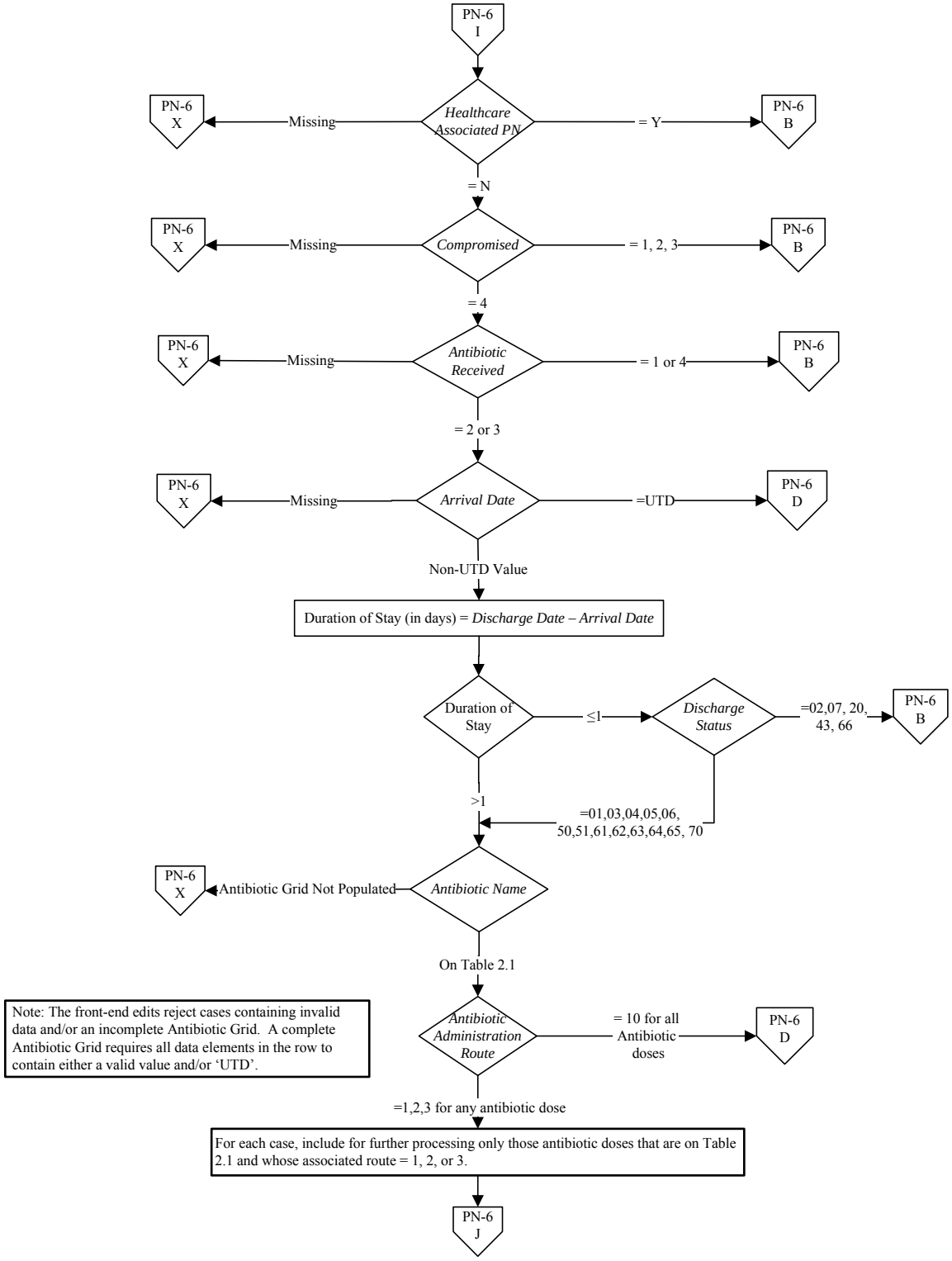
Numerator: Pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization

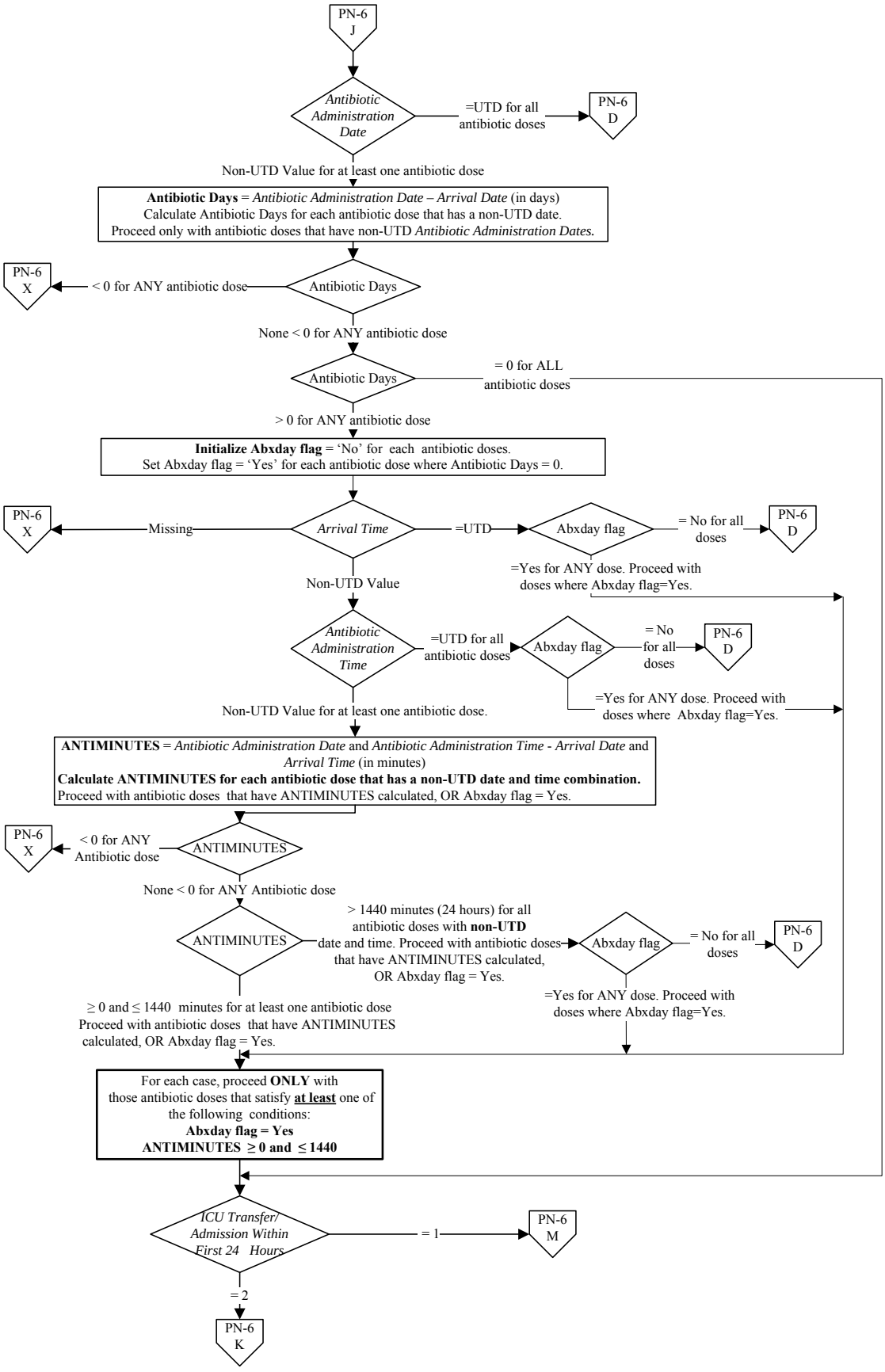
Denominator: Pneumonia patients 18 years of age and older.

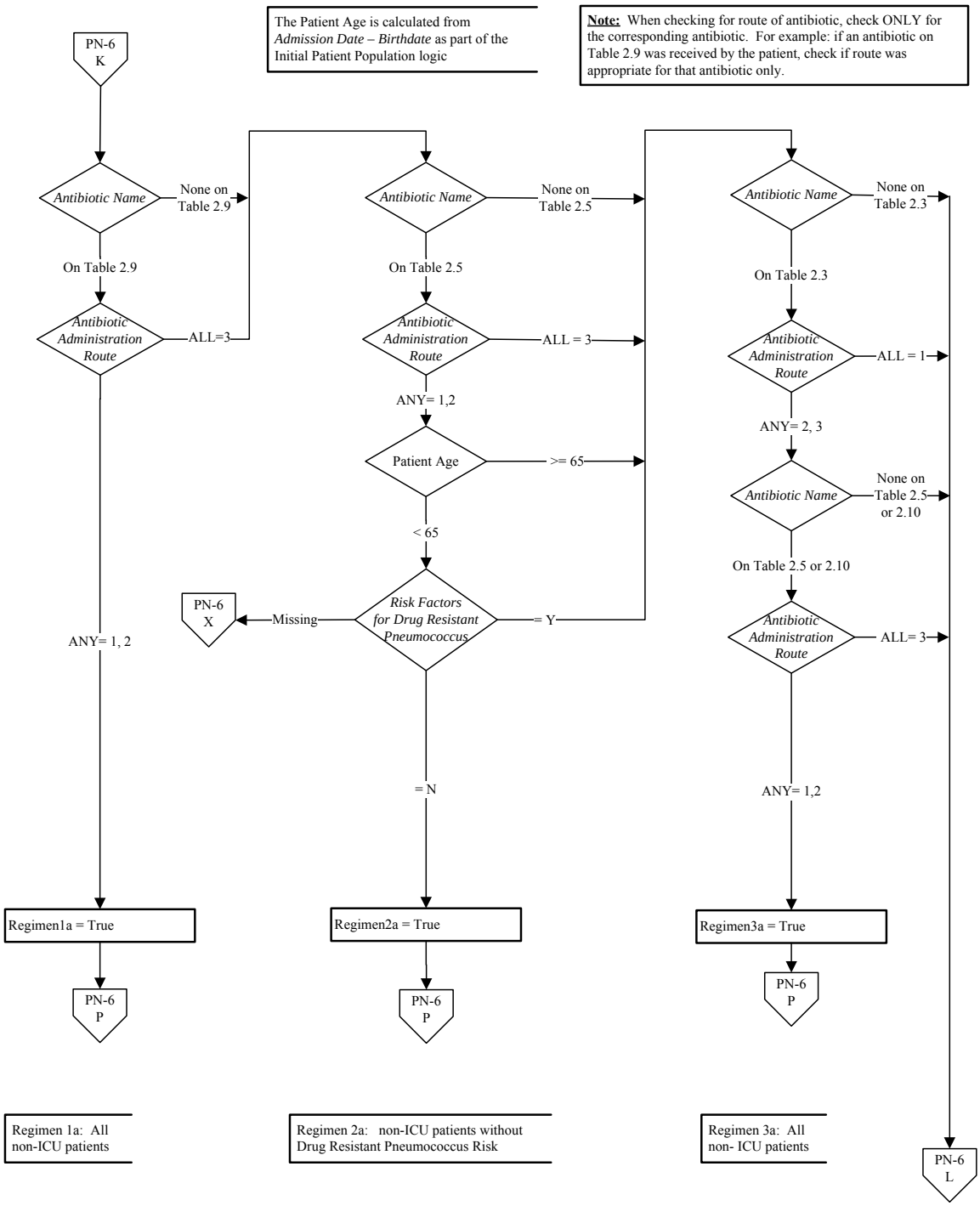


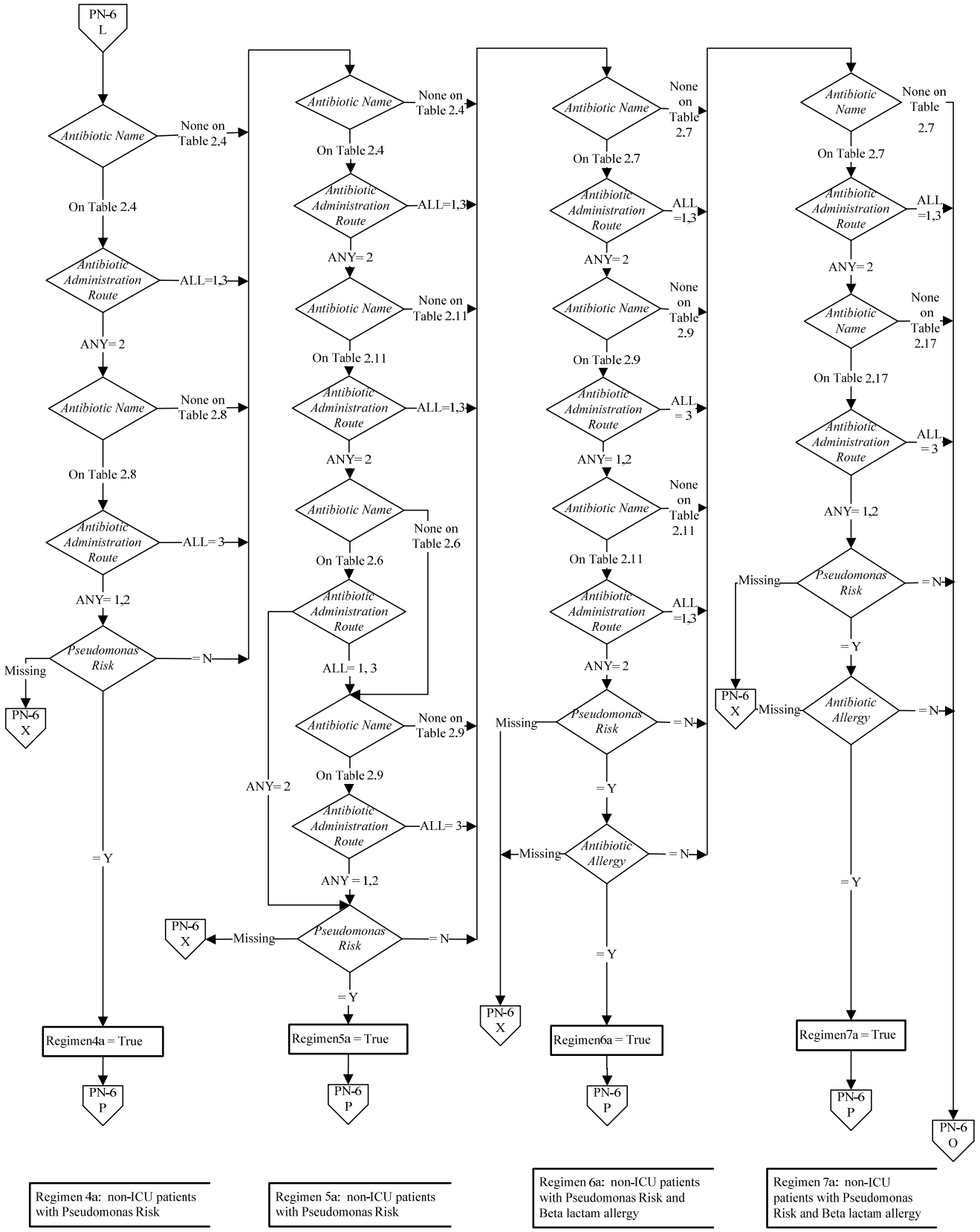
Variable Key:
Patient Age
Duration of Stay
Antibiotic Days
Abxday flag
ANTIMINUTES
Regimen1a
Regimen2a
Regimen3a
Regimen4a
Regimen5a
Regimen6a
Regimen7a
Regimen1b
Regimen2b
Regimen3b
Regimen4b
Regimen5b
Regimen6b

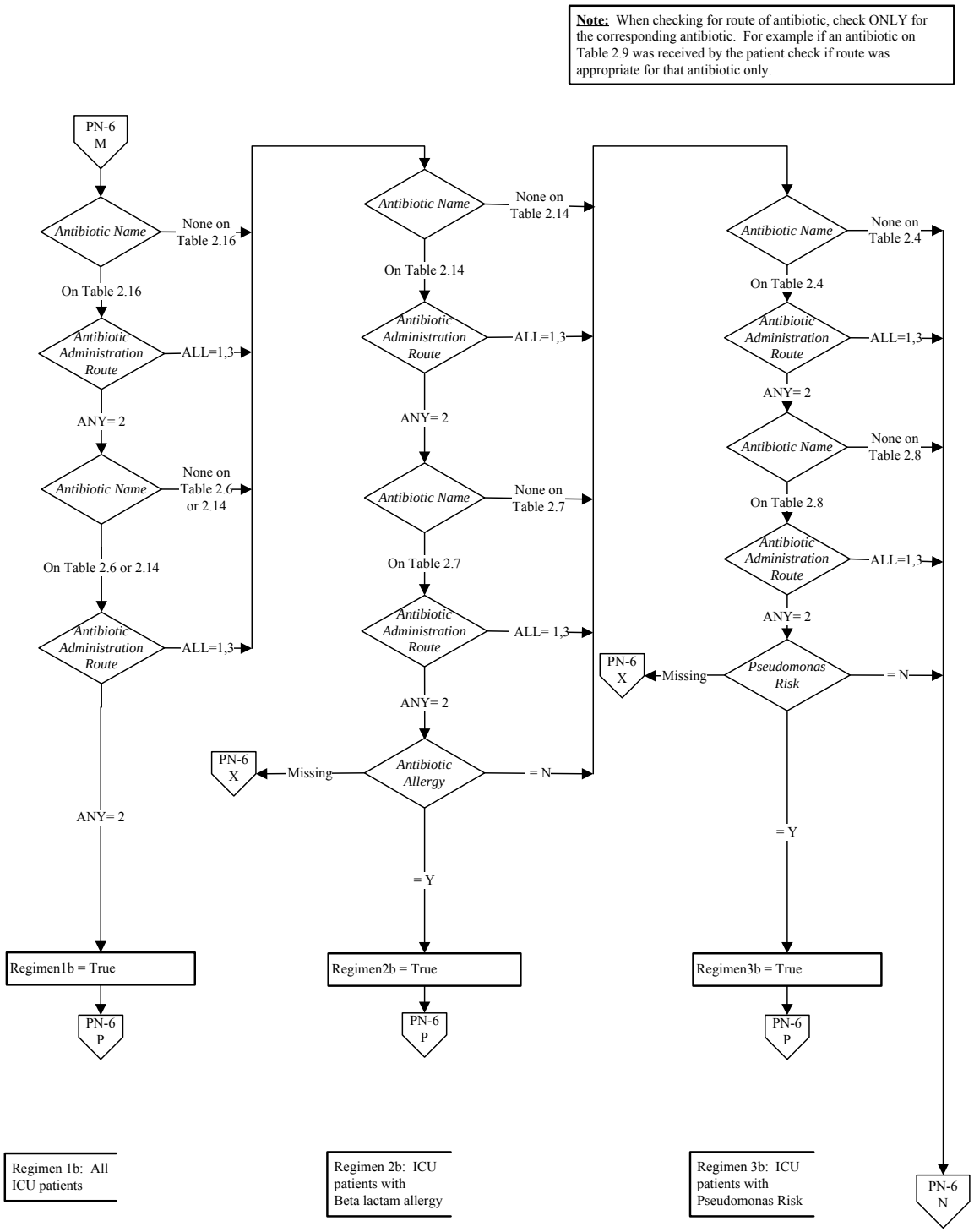

PN-6 H
Initialize Variables
Regimen1a = False
Regimen2a = False
Regimen3a = False
Regimen4a = False
Regimen5a = False
Regimen6a = False
Regimen7a = False
Regimen1b = False
Regimen2b = False
Regimen3b = False
Regimen4b = False
Regimen5b = False
Regimen6b = False
Transfer From Another ED
Missing
PN-6 X
= Y
PN-6 B
= N
Point of Origin for Admission or Visit
= 4, D, E
PN-6 B
= 1, 2, 5, 6, 7, 8, 9, F
Pneumonia Diagnosis: ED/ Direct Admit
Missing
PN-6 X
= 3
PN-6 B
= 1 ,2 or 4
ICU Transfer/ Admission Within First 24 Hours
Missing
PN-6 X
=3
PN-6 B
= 1,2
Pneumonia Diagnosis: ED/ Direct Admit
= 4
PN-6 D
= 1 or 2
Identified Pathogen
Missing
PN-6 X
=Y
PN-6 B
=N
PN-6 I

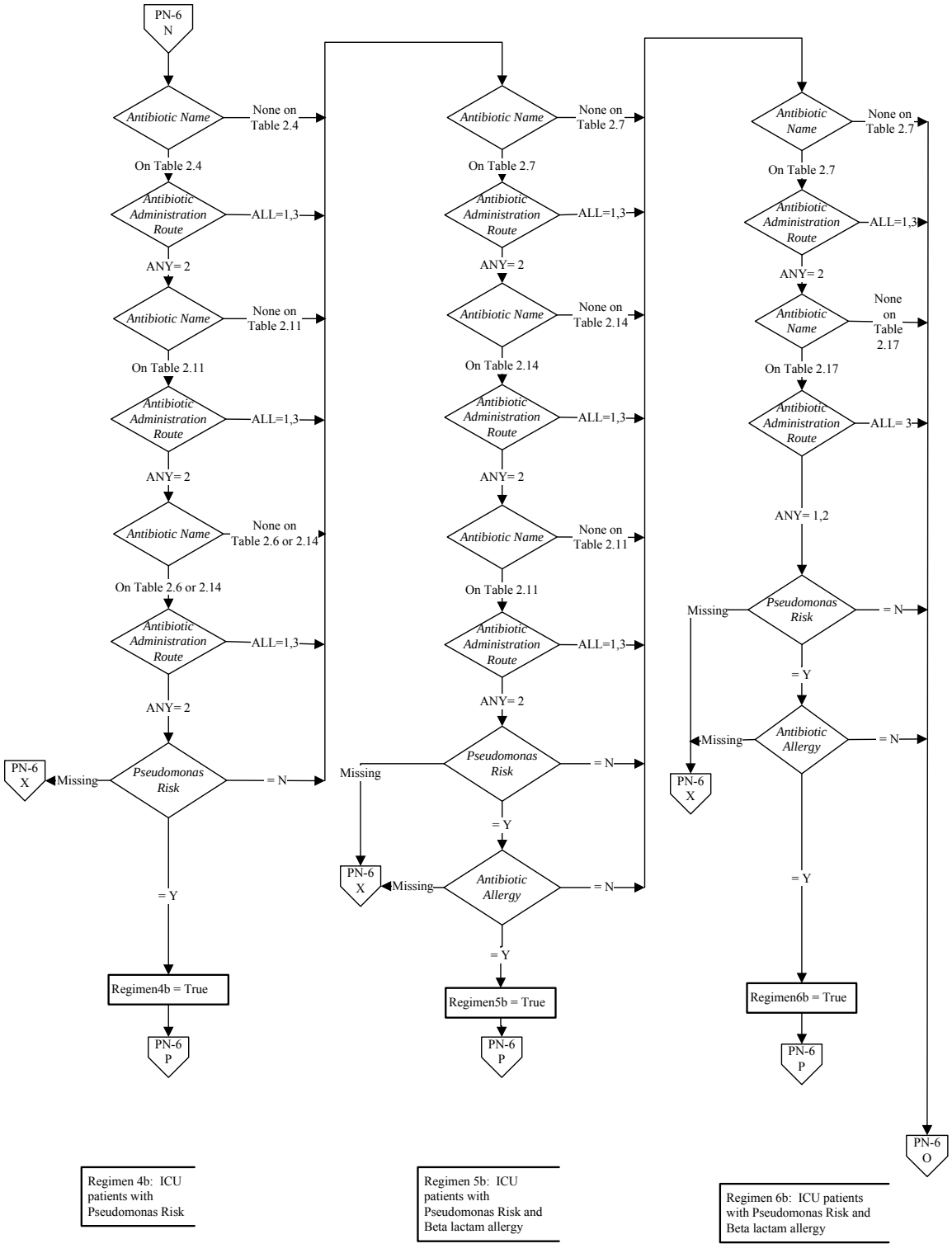

PN-6 I
Healthcare Associated PN
Missing
PN-6 X
= Y
PN-6 B
= N
Compromised
Missing
PN-6 X
= 1, 2, 3
PN-6 B
= 4
Antibiotic Received
Missing
PN-6 X
= 1 or 4
PN-6 B
= 2 or 3
Arrival Date
Missing
PN-6 X
=UTD
PN-6 D
Non-UTD Value
Duration of Stay (in days) = Discharge Date – Arrival Date
Duration of Stay
≤1
Discharge Status
=02,07, 20, 43, 66
PN-6 B
>1
=01,03,04,05,06, 50,51,61,62,63,64,65, 70
Antibiotic Name
Antibiotic Grid Not Populated
PN-6 X
On Table 2.1
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 Administration Route
= 10 for all Antibiotic doses
PN-6 D
=1,2,3 for any antibiotic dose
For each case, include for further processing only those antibiotic doses that are on Table 2.1 and whose associated route = 1, 2, or 3.
PN-6 J

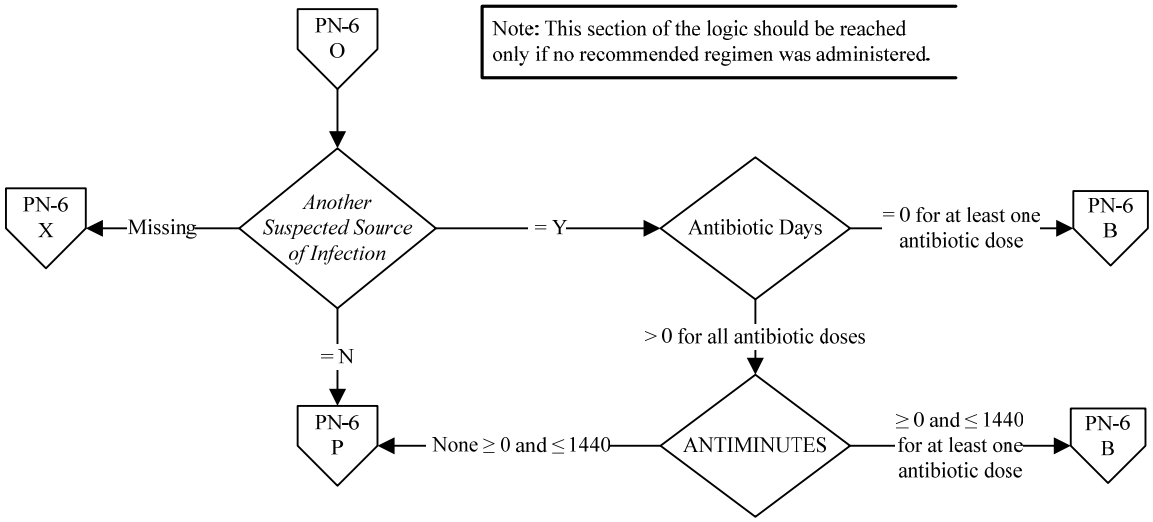

PN-6 J
Antibiotic Administration Date
=UTD for all antibiotic doses
PN-6 D
Non-UTD Value for at least one antibiotic dose
Antibiotic Days = Antibiotic Administration Date – Arrival Date (in days)
Calculate Antibiotic Days for each antibiotic dose that has a non-UTD date.
Proceed only with antibiotic doses that have non-UTD Antibiotic Administration Dates.
PN-6 X
< 0 for ANY antibiotic dose
Antibiotic Days
None < 0 for ANY antibiotic dose
Antibiotic Days
= 0 for ALL antibiotic doses
> 0 for ANY antibiotic dose
Initialize Abxday flag = 'No' for each antibiotic doses.
Set Abxday flag = 'Yes' for each antibiotic dose where Antibiotic Days = 0.
PN-6 X
Missing
Arrival Time
=UTD
Abxday flag
= No for all doses
PN-6 D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
Non-UTD Value
Antibiotic Administration Time
=UTD for all antibiotic doses
Abxday flag
= No for all doses
PN-6 D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
Non-UTD Value for at least one antibiotic dose.
ANTIMINUTES = Antibiotic Administration Date and Antibiotic Administration Time - Arrival Date and Arrival Time (in minutes)
Calculate ANTIMINUTES for each antibiotic dose that has a non-UTD date and time combination.
Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
PN-6 X
< 0 for ANY Antibiotic dose
ANTIMINUTES
None < 0 for ANY Antibiotic dose
ANTIMINUTES
> 1440 minutes (24 hours) for all antibiotic doses with non-UTD date and time. Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
Abxday flag
= No for all doses
PN-6 D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
≥ 0 and ≤ 1440 minutes for at least one antibiotic dose
Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
For each case, proceed ONLY with those antibiotic doses that satisfy at least one of the following conditions:
Abxday flag = Yes
ANTIMINUTES ≥ 0 and ≤ 1440
ICU Transfer/ Admission Within First 24 Hours
= 1
PN-6 M
= 2
PN-6 K

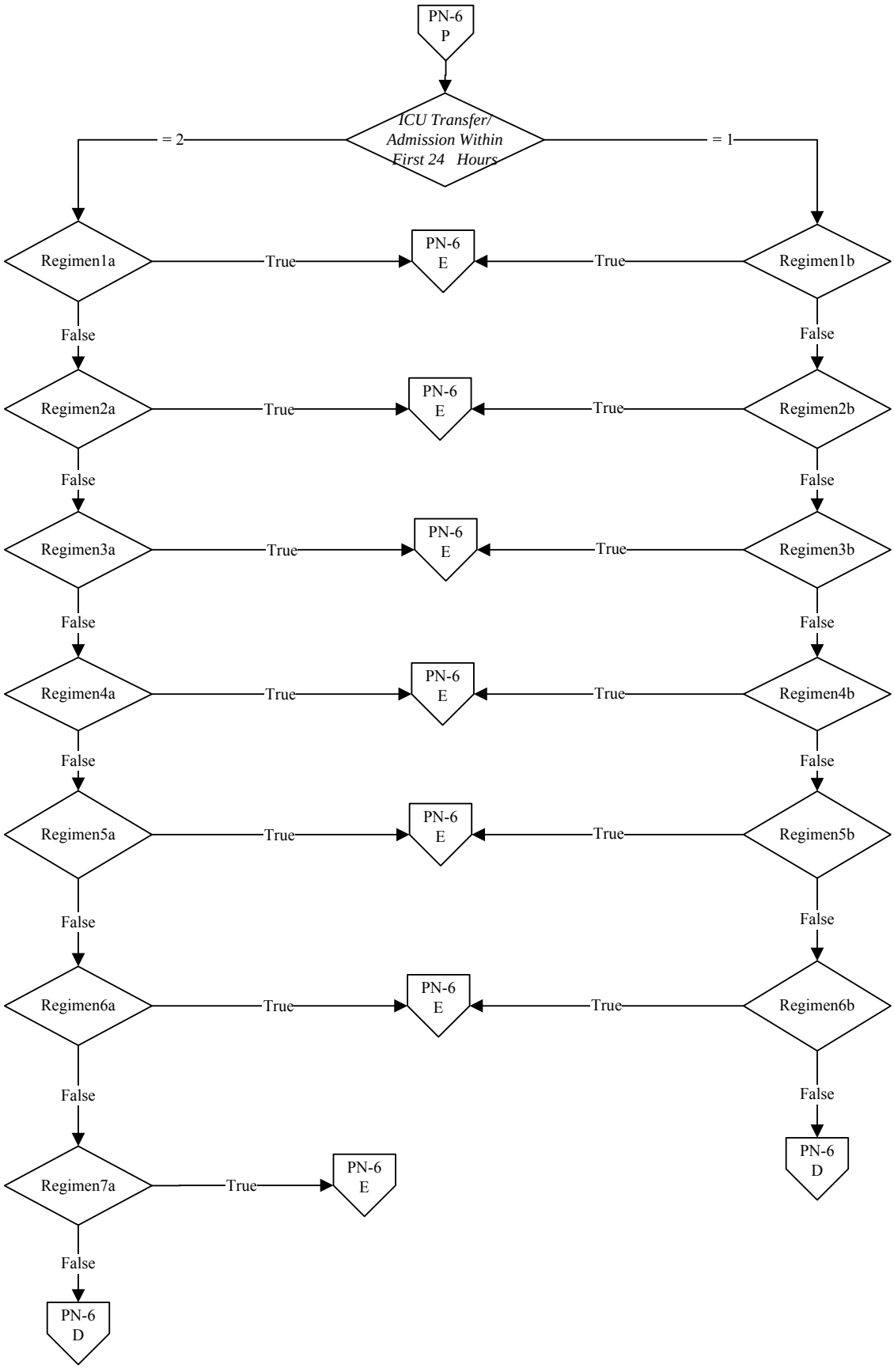

PN-6 K
The Patient Age is calculated from *Admission Date – Birthdate* as part of the Initial Patient Population logic
Note: When checking for route of antibiotic, check ONLY for the corresponding antibiotic. For example: if an antibiotic on Table 2.9 was received by the patient, check if route was appropriate for that antibiotic only.
Antibiotic Name
None on Table 2.9
On Table 2.9
Antibiotic Administration Route
ALL=3
ANY= 1, 2
Antibiotic Name
None on Table 2.5
On Table 2.5
Antibiotic Administration Route
ALL = 3
ANY= 1,2
Patient Age
>= 65
< 65
Risk Factors for Drug Resistant Pneumococcus
Missing
PN-6 X
= Y
= N
Antibiotic Name
None on Table 2.3
On Table 2.3
Antibiotic Administration Route
ALL = 1
ANY= 2, 3
Antibiotic Name
None on Table 2.5 or 2.10
On Table 2.5 or 2.10
Antibiotic Administration Route
ALL= 3
ANY= 1,2
Regimen1a = True
Regimen2a = True
Regimen3a = True
PN-6 P
PN-6 P
PN-6 P
Regimen 1a: All non-ICU patients
Regimen 2a: non-ICU patients without Drug Resistant Pneumococcus Risk
Regimen 3a: All non- ICU patients
PN-6 L

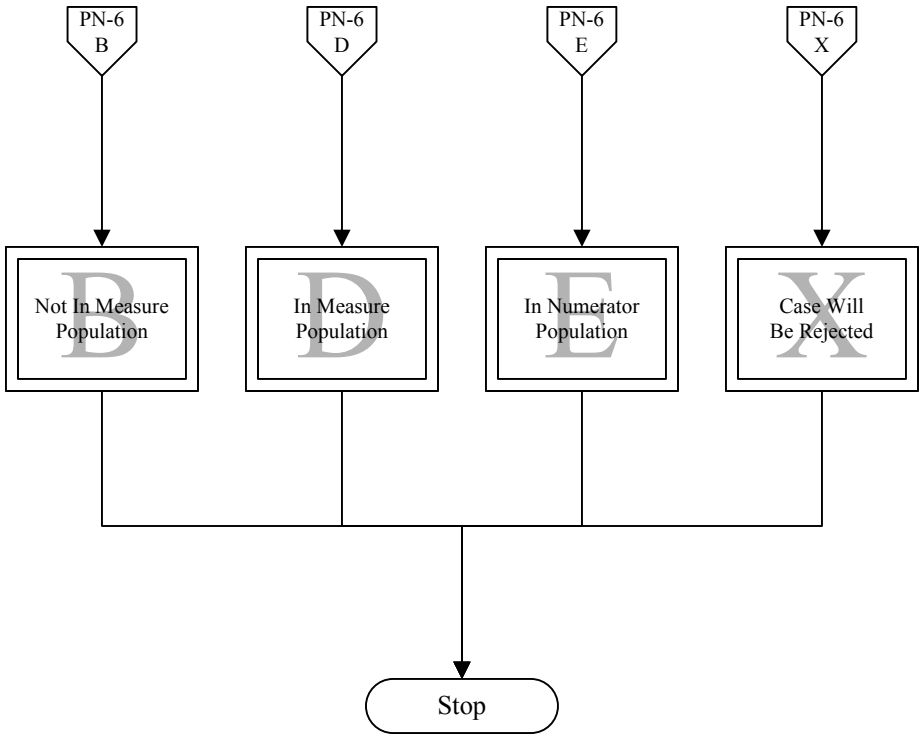

PN-6 L
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.8
On Table 2.8
Antibiotic Administration Route
ALL= 3
ANY= 1,2
Pseudomonas Risk
= N
Missing
PN-6 X
= Y
Regimen4a = True
PN-6 P
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.11
On Table 2.11
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.6
On Table 2.6
Antibiotic Administration Route
ALL= 1, 3
Antibiotic Name
None on Table 2.9
On Table 2.9
Antibiotic Administration Route
ALL= 3
ANY = 1,2
ANY= 2
Pseudomonas Risk
Missing
PN-6 X
= N
= Y
Regimen5a = True
PN-6 P
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL =1,3
ANY= 2
Antibiotic Name
None on Table 2.9
On Table 2.9
Antibiotic Administration Route
ALL = 3
ANY= 1,2
Antibiotic Name
None on Table 2.11
On Table 2.11
Antibiotic Administration Route
ALL =1,3
ANY= 2
Pseudomonas Risk
Missing
= N
= Y
Antibiotic Allergy
Missing
= N
= Y
PN-6 X
Regimen6a = True
PN-6 P
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL =1,3
ANY= 2
Antibiotic Name
None on Table 2.17
On Table 2.17
Antibiotic Administration Route
ALL = 3
ANY= 1,2
Pseudomonas Risk
Missing
= N
= Y
PN-6 X
Antibiotic Allergy
Missing
= N
= Y
Regimen7a = True
PN-6 P
PN-6 O
Regimen 4a: non-ICU patients with Pseudomonas Risk
Regimen 5a: non-ICU patients with Pseudomonas Risk
Regimen 6a: non-ICU patients with Pseudomonas Risk and Beta lactam allergy
Regimen 7a: non-ICU patients with Pseudomonas Risk and Beta lactam allergy


Note: When checking for route of antibiotic, check ONLY for the corresponding antibiotic. For example if an antibiotic on Table 2.9 was received by the patient check if route was appropriate for that antibiotic only.
PN-6 M
Antibiotic Name
None on Table 2.16
On Table 2.16
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.6 or 2.14
On Table 2.6 or 2.14
Antibiotic Administration Route
ALL=1,3
ANY= 2
Regimen1b = True
PN-6 P
Antibiotic Name
None on Table 2.14
On Table 2.14
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL= 1,3
ANY= 2
PN-6 X
Missing
Antibiotic Allergy
= N
= Y
Regimen2b = True
PN-6 P
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.8
On Table 2.8
Antibiotic Administration Route
ALL=1,3
ANY= 2
PN-6 X
Missing
Pseudomonas Risk
= N
= Y
Regimen3b = True
PN-6 P
Regimen 1b: All ICU patients
Regimen 2b: ICU patients with Beta lactam allergy
Regimen 3b: ICU patients with Pseudomonas Risk
PN-6 N


PN-6 N
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.11
On Table 2.11
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.6 or 2.14
On Table 2.6 or 2.14
Antibiotic Administration Route
ALL=1,3
ANY= 2
Pseudomonas Risk
Missing
PN-6 X
= N
= Y
Regimen4b = True
PN-6 P
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.14
On Table 2.14
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.11
On Table 2.11
Antibiotic Administration Route
ALL=1,3
ANY= 2
Pseudomonas Risk
Missing
PN-6 X
= N
= Y
Antibiotic Allergy
Missing
PN-6 X
= N
= Y
Regimen5b = True
PN-6 P
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.17
On Table 2.17
Antibiotic Administration Route
ALL= 3
ANY= 1,2
Pseudomonas Risk
Missing
PN-6 X
= N
= Y
Antibiotic Allergy
Missing
= N
= Y
Regimen6b = True
PN-6 P
PN-6 O
Regimen 4b: ICU patients with Pseudomonas Risk
Regimen 5b: ICU patients with Pseudomonas Risk and Beta lactam allergy
Regimen 6b: ICU patients with Pseudomonas Risk and Beta lactam allergy


PN-6
O
Note: This section of the logic should be reached only if no recommended regimen was administered.
PN-6
X
Missing
Another Suspected Source of Infection
= Y
Antibiotic Days
= 0 for at least one antibiotic dose
PN-6
B
= N
> 0 for all antibiotic doses
PN-6
P
None ≥ 0 and ≤ 1440
ANTIMINUTES
≥ 0 and ≤ 1440 for at least one antibiotic dose
PN-6
B

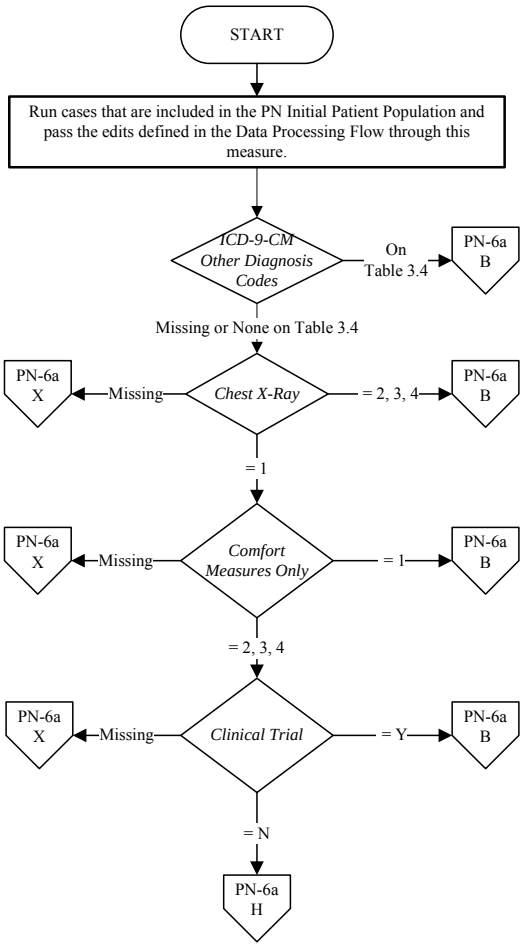

PN-6
P
ICU Transfer/
Admission Within
First 24 Hours
= 2
= 1
Regimen1a
True
PN-6
E
True
Regimen1b
False
False
Regimen2a
True
PN-6
E
True
Regimen2b
False
False
Regimen3a
True
PN-6
E
True
Regimen3b
False
False
Regimen4a
True
PN-6
E
True
Regimen4b
False
False
Regimen5a
True
PN-6
E
True
Regimen5b
False
False
Regimen6a
True
PN-6
E
True
Regimen6b
False
False
Regimen7a
True
PN-6
E
PN-6
D
False
PN-6
D


PN-6
B
PN-6
D
PN-6
E
PN-6
X
B
Not In Measure Population
D
In Measure Population
E
In Numerator Population
X
Case Will Be Rejected
Stop

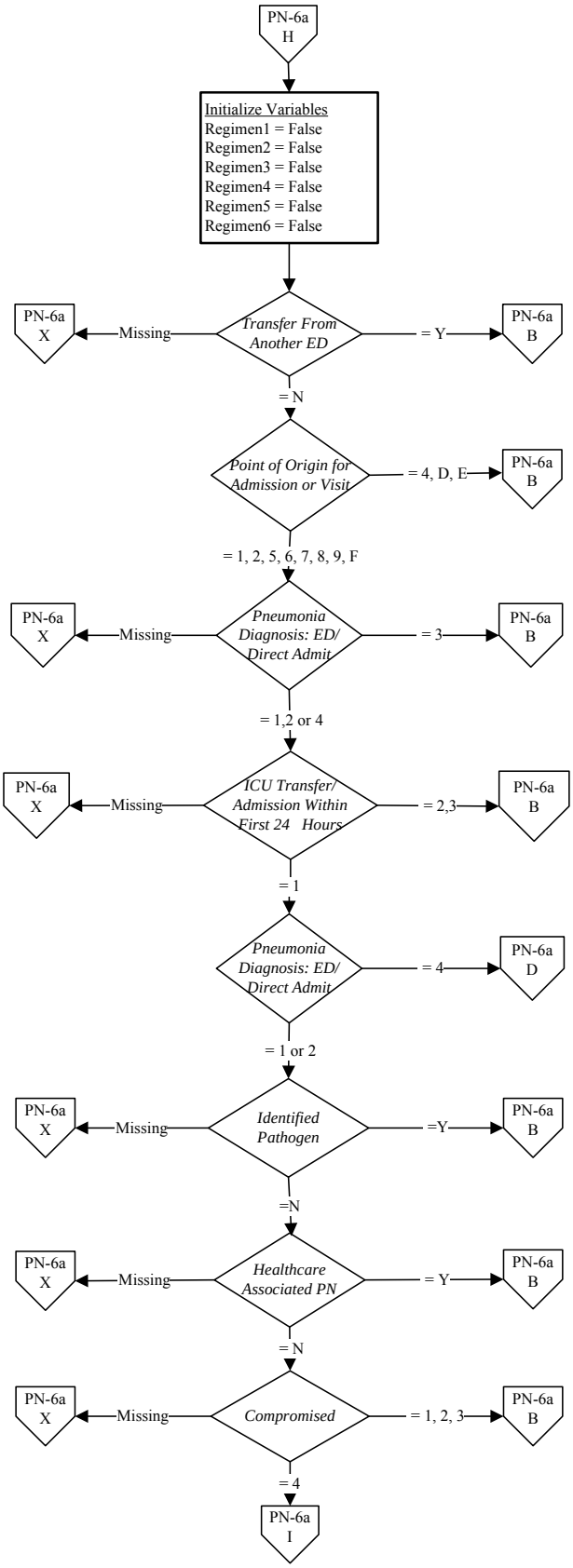
PN-6a: Initial Antibiotic Selection For Community-Acquired Pneumonia (CAP) In Immunocompetent Patients -Intensive Care Unit (ICU) Patients

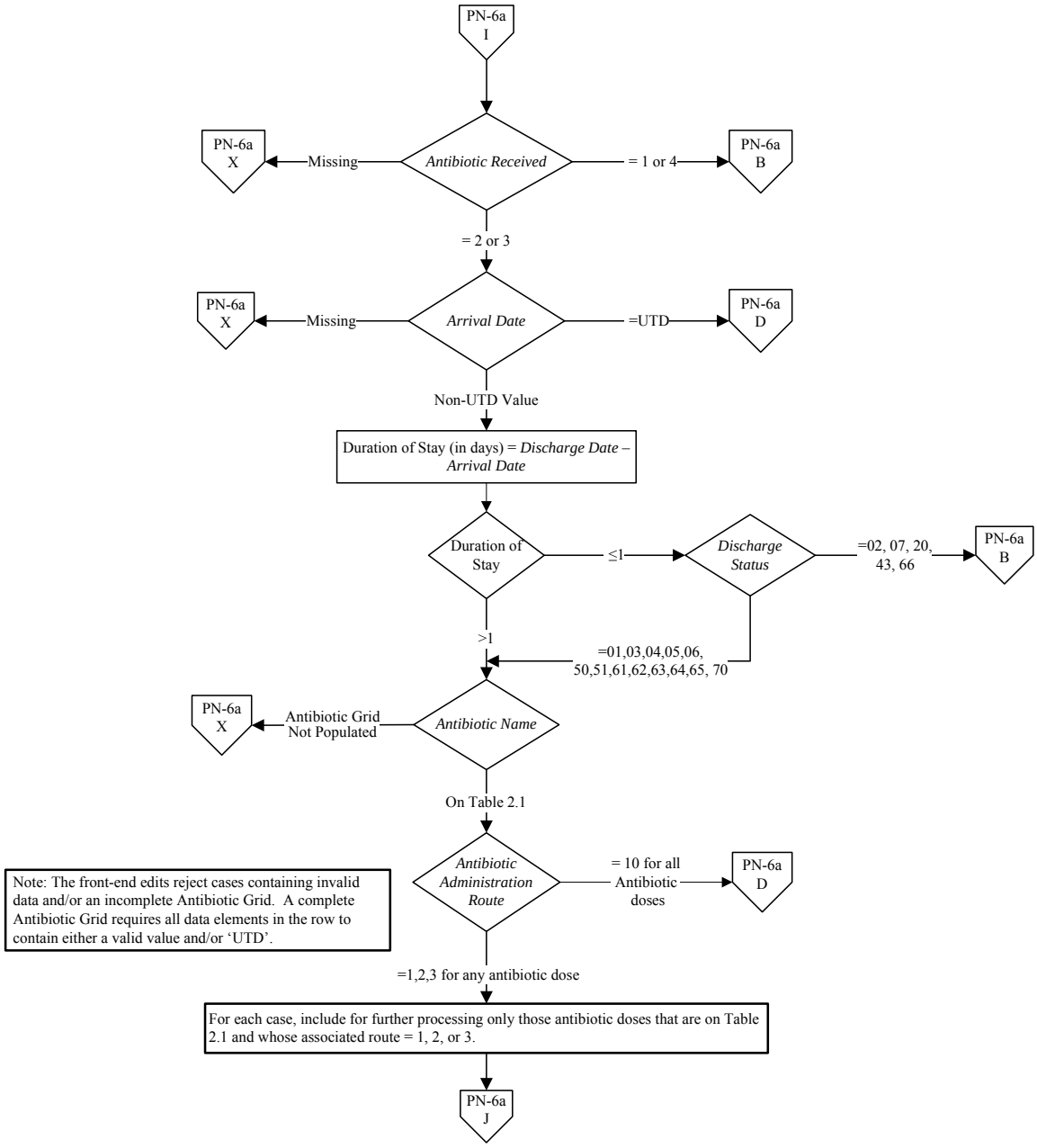
Numerator: ICU pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization

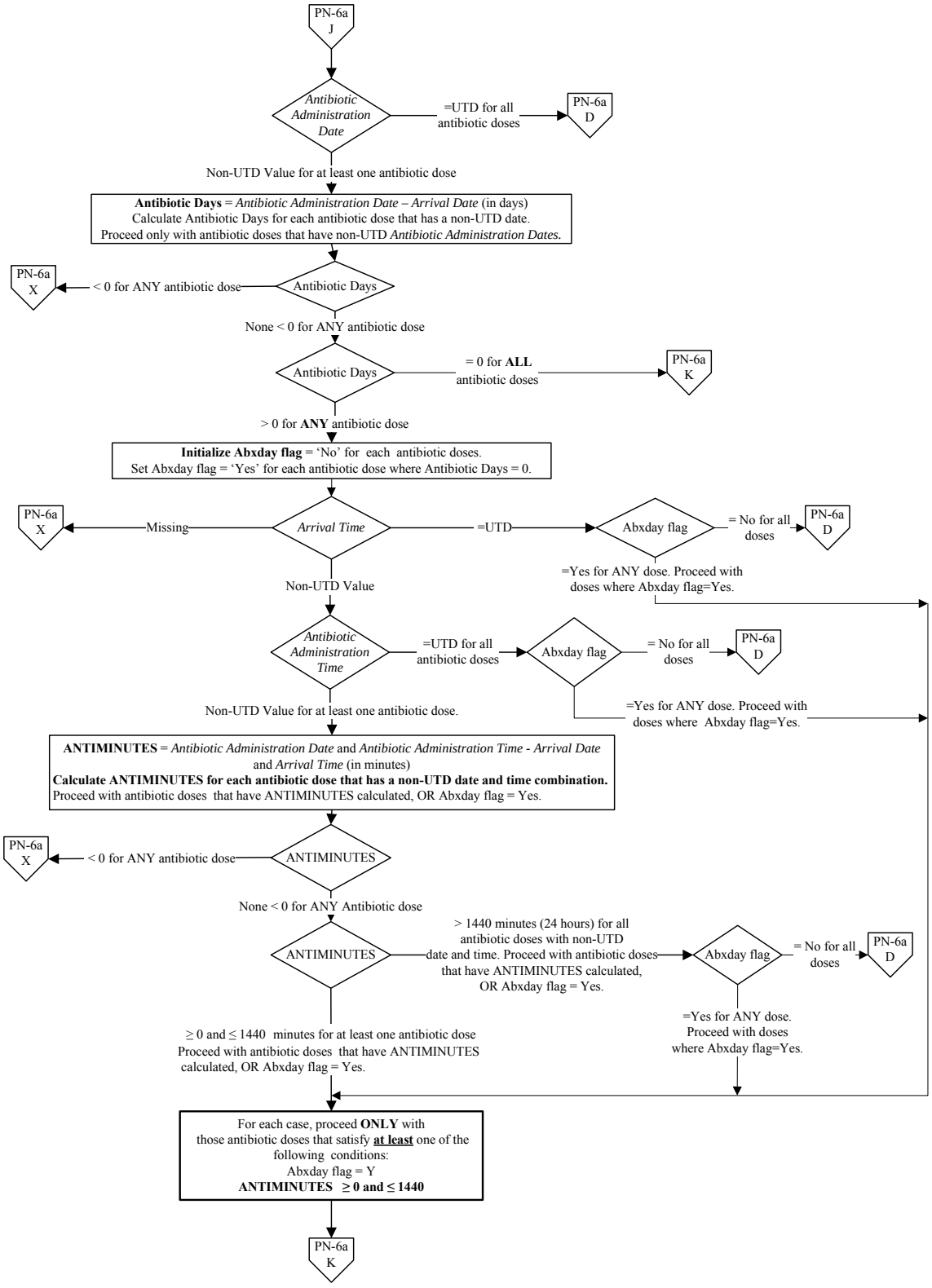
Denominator: ICU pneumonia patients 18 years of age and older.

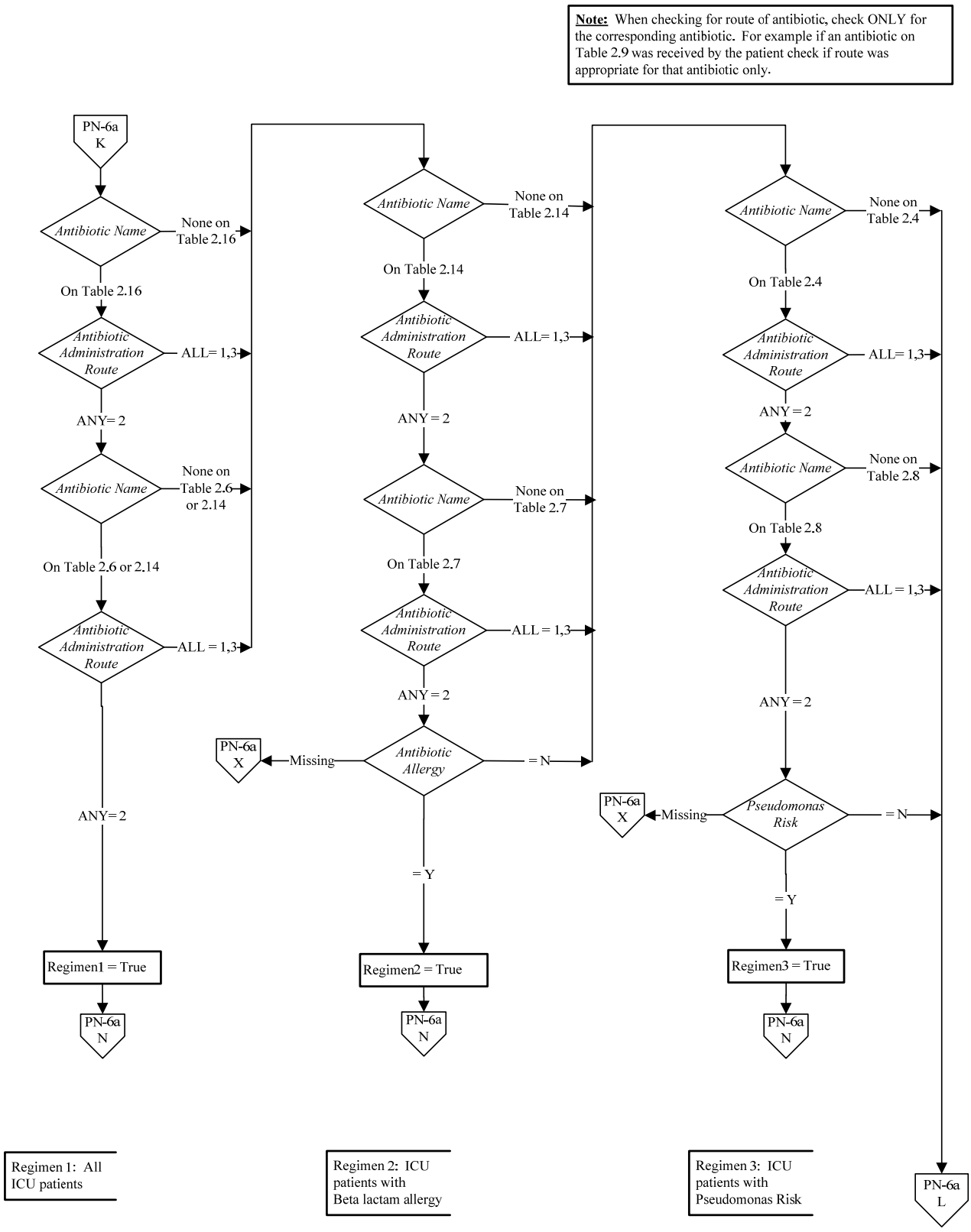


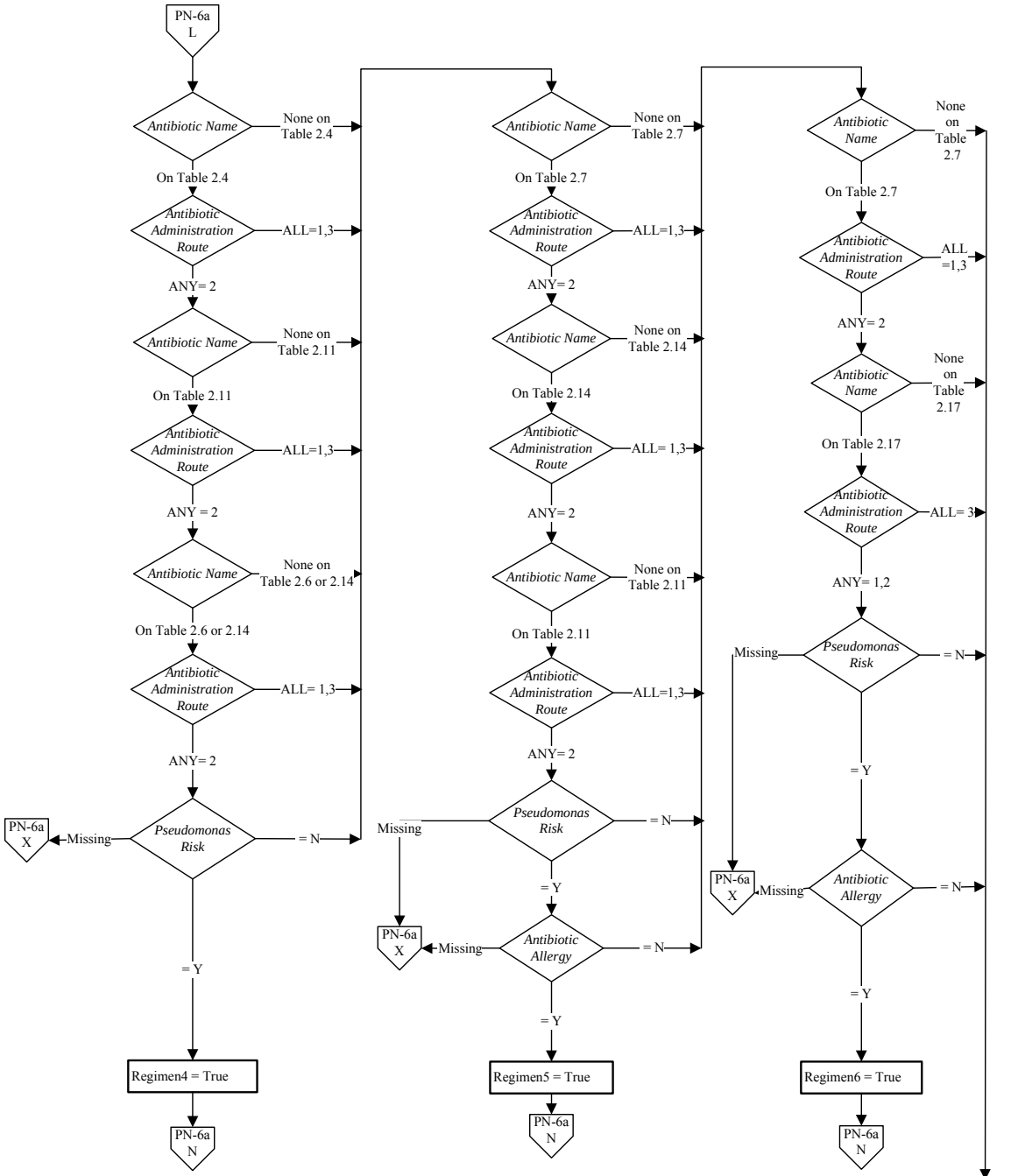
Variable Key:
Duration of Stay
Antibiotic Days
ANTIMINUTES
Abxday flag
Regimen1
Regimen2
Regimen3
Regimen4
Regimen5
Regimen6


PN-6a H
Initialize Variables
Regimen1 = False
Regimen2 = False
Regimen3 = False
Regimen4 = False
Regimen5 = False
Regimen6 = False
Transfer From Another ED
Missing
PN-6a X
= Y
PN-6a B
= N
Point of Origin for Admission or Visit
= 4, D, E
PN-6a B
= 1, 2, 5, 6, 7, 8, 9, F
Pneumonia Diagnosis: ED/ Direct Admit
Missing
PN-6a X
= 3
PN-6a B
= 1,2 or 4
ICU Transfer/ Admission Within First 24 Hours
Missing
PN-6a X
= 2,3
PN-6a B
= 1
Pneumonia Diagnosis: ED/ Direct Admit
= 4
PN-6a D
= 1 or 2
Identified Pathogen
Missing
PN-6a X
=Y
PN-6a B
=N
Healthcare Associated PN
Missing
PN-6a X
= Y
PN-6a B
= N
Compromised
Missing
PN-6a X
= 1, 2, 3
PN-6a B
= 4
PN-6a I


PN-6a I
Antibiotic Received
Missing
PN-6a X
= 1 or 4
PN-6a B
= 2 or 3
Arrival Date
Missing
PN-6a X
=UTD
PN-6a D
Non-UTD Value
Duration of Stay (in days) = Discharge Date – Arrival Date
Duration of Stay
≤1
Discharge Status
=02, 07, 20, 43, 66
PN-6a B
>1
=01,03,04,05,06, 50,51,61,62,63,64,65, 70
Antibiotic Name
Antibiotic Grid Not Populated
PN-6a X
On Table 2.1
Antibiotic Administration Route
= 10 for all Antibiotic doses
PN-6a D
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'.
=1,2,3 for any antibiotic dose
For each case, include for further processing only those antibiotic doses that are on Table 2.1 and whose associated route = 1, 2, or 3.
PN-6a J


PN-6a J
Antibiotic Administration Date
=UTD for all antibiotic doses
PN-6a D
Non-UTD Value for at least one antibiotic dose
Antibiotic Days = *Antibiotic Administration Date – Arrival Date* (in days)
Calculate Antibiotic Days for each antibiotic dose that has a non-UTD date.
Proceed only with antibiotic doses that have non-UTD *Antibiotic Administration Dates.*
PN-6a X
< 0 for ANY antibiotic dose
Antibiotic Days
None < 0 for ANY antibiotic dose
Antibiotic Days
= 0 for **ALL** antibiotic doses
PN-6a K
> 0 for **ANY** antibiotic dose
Initialize Abxday flag = 'No' for each antibiotic doses.
Set Abxday flag = 'Yes' for each antibiotic dose where Antibiotic Days = 0.
PN-6a X
Missing
Arrival Time
=UTD
Abxday flag
= No for all doses
PN-6a D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
Non-UTD Value
Antibiotic Administration Time
=UTD for all antibiotic doses
Abxday flag
= No for all doses
PN-6a D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
Non-UTD Value for at least one antibiotic dose.
ANTIMINUTES = *Antibiotic Administration Date* and *Antibiotic Administration Time - Arrival Date* and *Arrival Time* (in minutes)
Calculate ANTIMINUTES for each antibiotic dose that has a non-UTD date and time combination.
Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
PN-6a X
< 0 for ANY antibiotic dose
ANTIMINUTES
None < 0 for ANY Antibiotic dose
ANTIMINUTES
> 1440 minutes (24 hours) for all antibiotic doses with non-UTD date and time. Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
Abxday flag
= No for all doses
PN-6a D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
≥ 0 and ≤ 1440 minutes for at least one antibiotic dose
Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
For each case, proceed **ONLY** with those antibiotic doses that satisfy **at least** one of the following conditions:
Abxday flag = Y
ANTIMINUTES ≥ 0 and ≤ 1440
PN-6a K

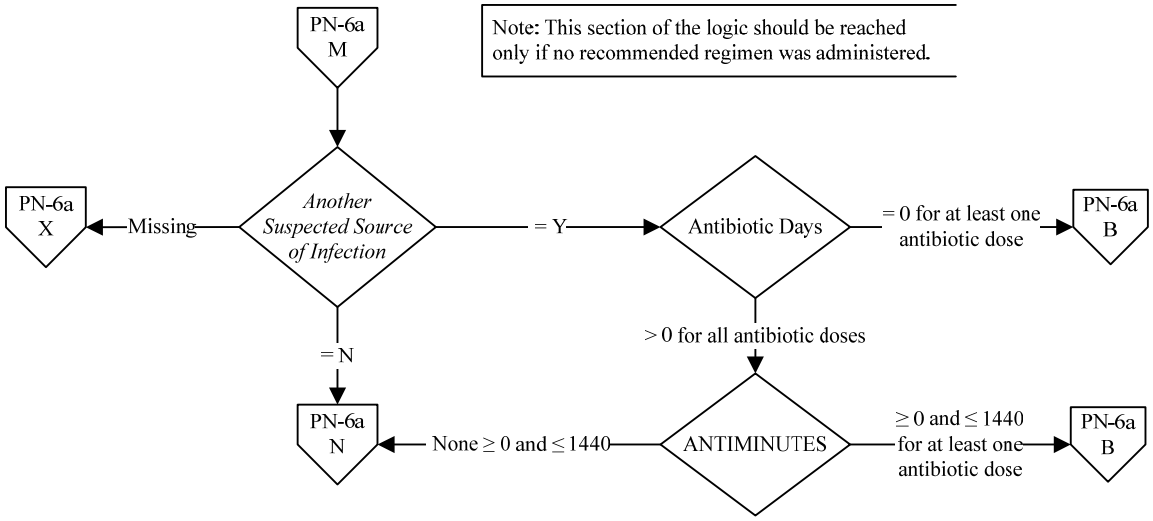

Note: When checking for route of antibiotic, check ONLY for the corresponding antibiotic. For example if an antibiotic on Table 2.9 was received by the patient check if route was appropriate for that antibiotic only.
PN-6a K
Antibiotic Name
None on Table 2.16
On Table 2.16
Antibiotic Administration Route
ALL= 1,3
ANY= 2
Antibiotic Name
None on Table 2.6 or 2.14
On Table 2.6 or 2.14
Antibiotic Administration Route
ALL = 1,3
ANY= 2
Regimen1 = True
PN-6a N
Antibiotic Name
None on Table 2.14
On Table 2.14
Antibiotic Administration Route
ALL= 1,3
ANY = 2
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL = 1,3
ANY = 2
Antibiotic Allergy
Missing
PN-6a X
= N
= Y
Regimen2 = True
PN-6a N
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL= 1,3
ANY = 2
Antibiotic Name
None on Table 2.8
On Table 2.8
Antibiotic Administration Route
ALL = 1,3
ANY = 2
Pseudomonas Risk
Missing
PN-6a X
= N
= Y
Regimen3 = True
PN-6a N
PN-6a L
Regimen 1: All ICU patients
Regimen 2: ICU patients with Beta lactam allergy
Regimen 3: ICU patients with Pseudomonas Risk

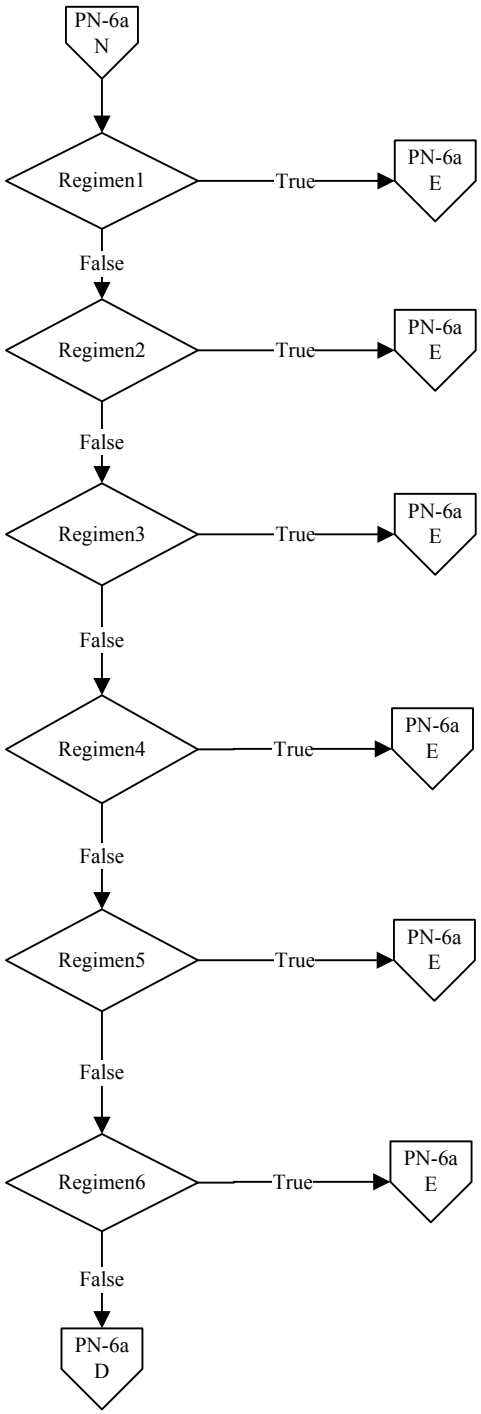


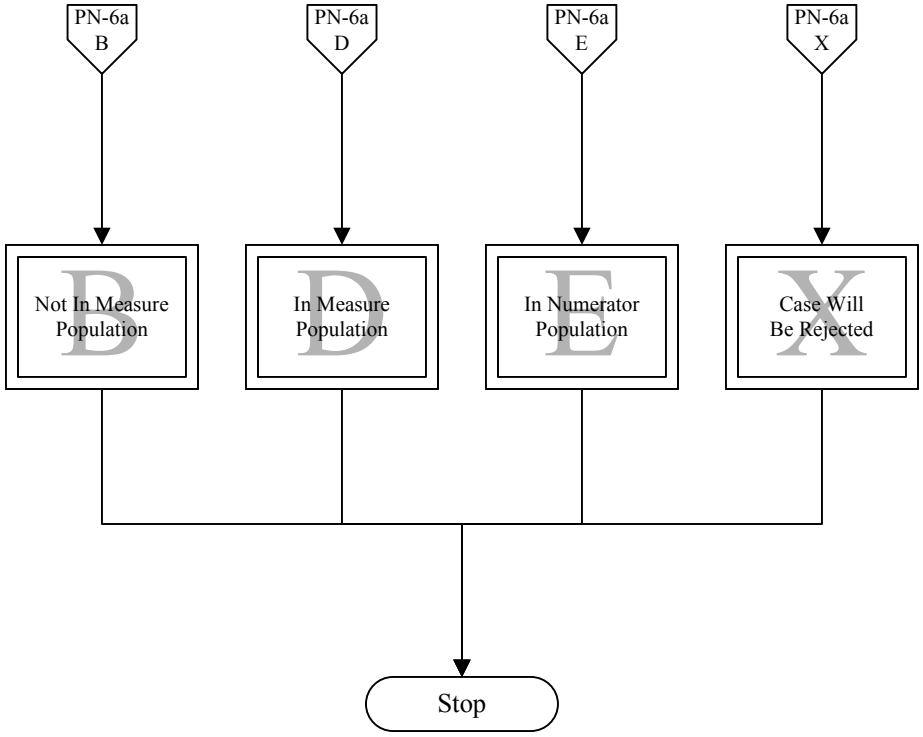
Regimen 4: ICU patients with Pseudomonas Risk

Regimen 5: ICU patients with Pseudomonas Risk and Beta lactam allergy

Regimen 6: ICU patients with Pseudomonas Risk and Beta lactam allergy


PN-6a M
Note: This section of the logic should be reached only if no recommended regimen was administered.
PN-6a X
Missing
Another Suspected Source of Infection
= Y
Antibiotic Days
= 0 for at least one antibiotic dose
PN-6a B
= N
> 0 for all antibiotic doses
PN-6a N
None ≥ 0 and ≤ 1440
ANTIMINUTES
≥ 0 and ≤ 1440 for at least one antibiotic dose
PN-6a B

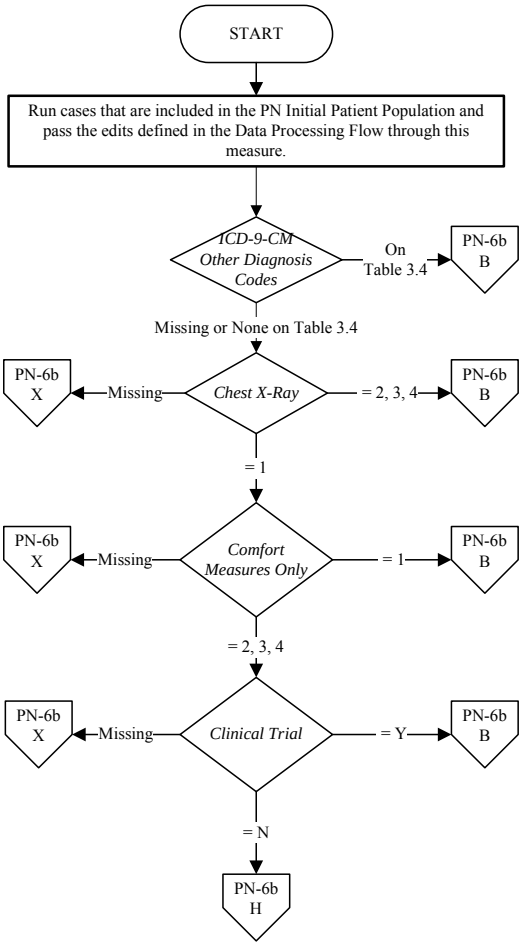

PN-6a
N
Regimen1
True
PN-6a
E
False
Regimen2
True
PN-6a
E
False
Regimen3
True
PN-6a
E
False
Regimen4
True
PN-6a
E
False
Regimen5
True
PN-6a
E
False
Regimen6
True
PN-6a
E
False
PN-6a
D


PN-6a
B
PN-6a
D
PN-6a
E
PN-6a
X
B
Not In Measure
Population
D
In Measure
Population
E
In Numerator
Population
X
Case Will
Be Rejected
Stop

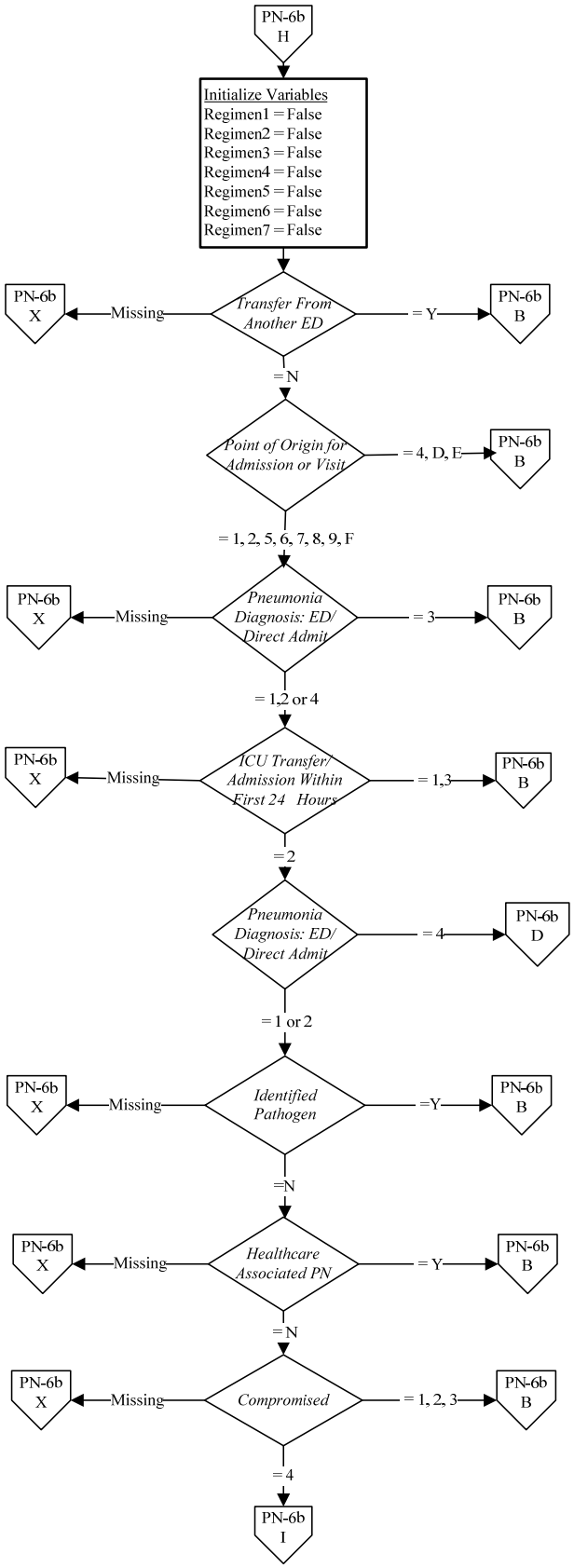
PN-6b: Initial Antibiotic Selection For Community-Acquired Pneumonia (CAP) In Immunocompetent Patients - Non Intensive Care Unit Patients

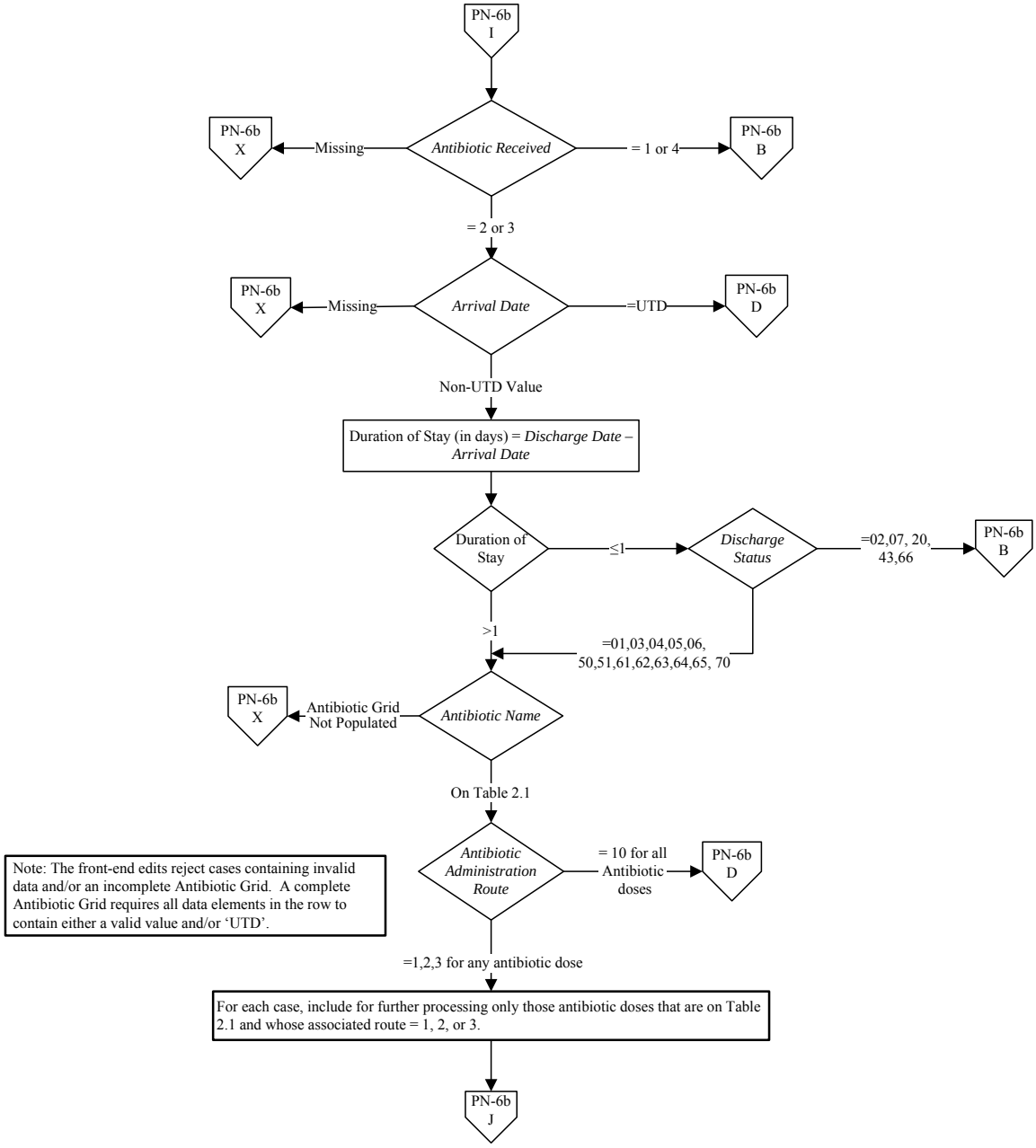
Numerator: Non-ICU pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization

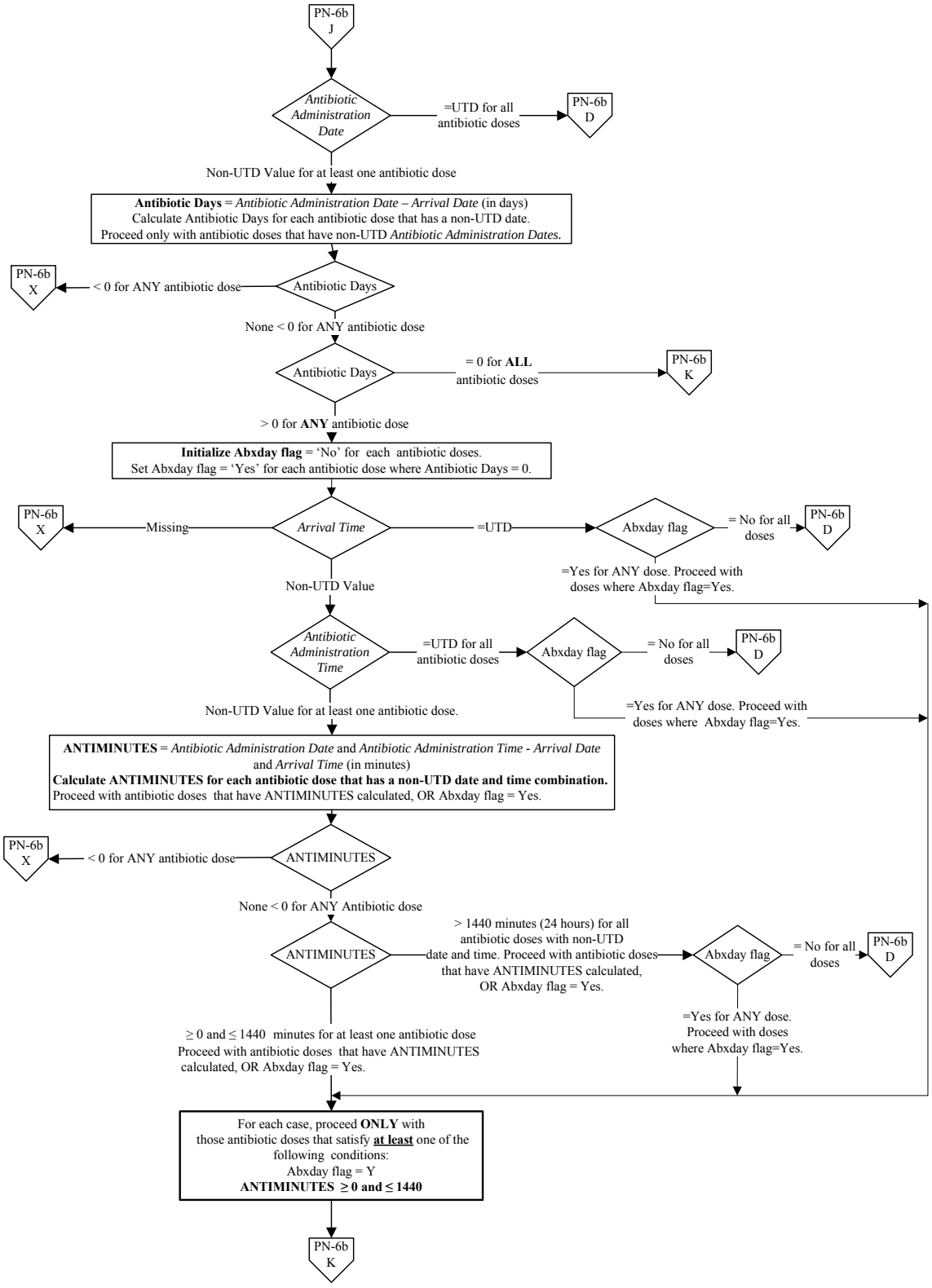
Denominator: Non-ICU pneumonia patients 18 years of age and older.

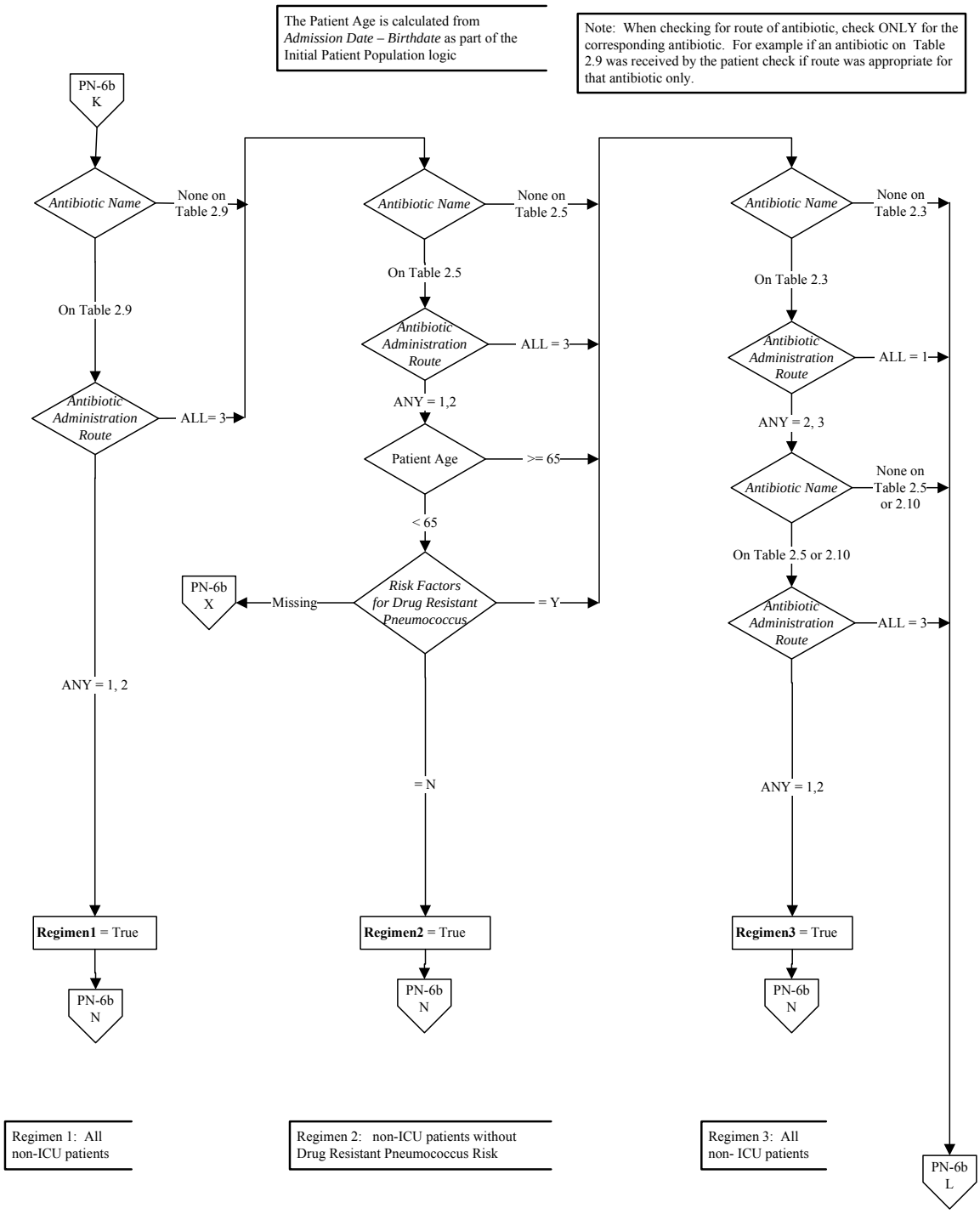


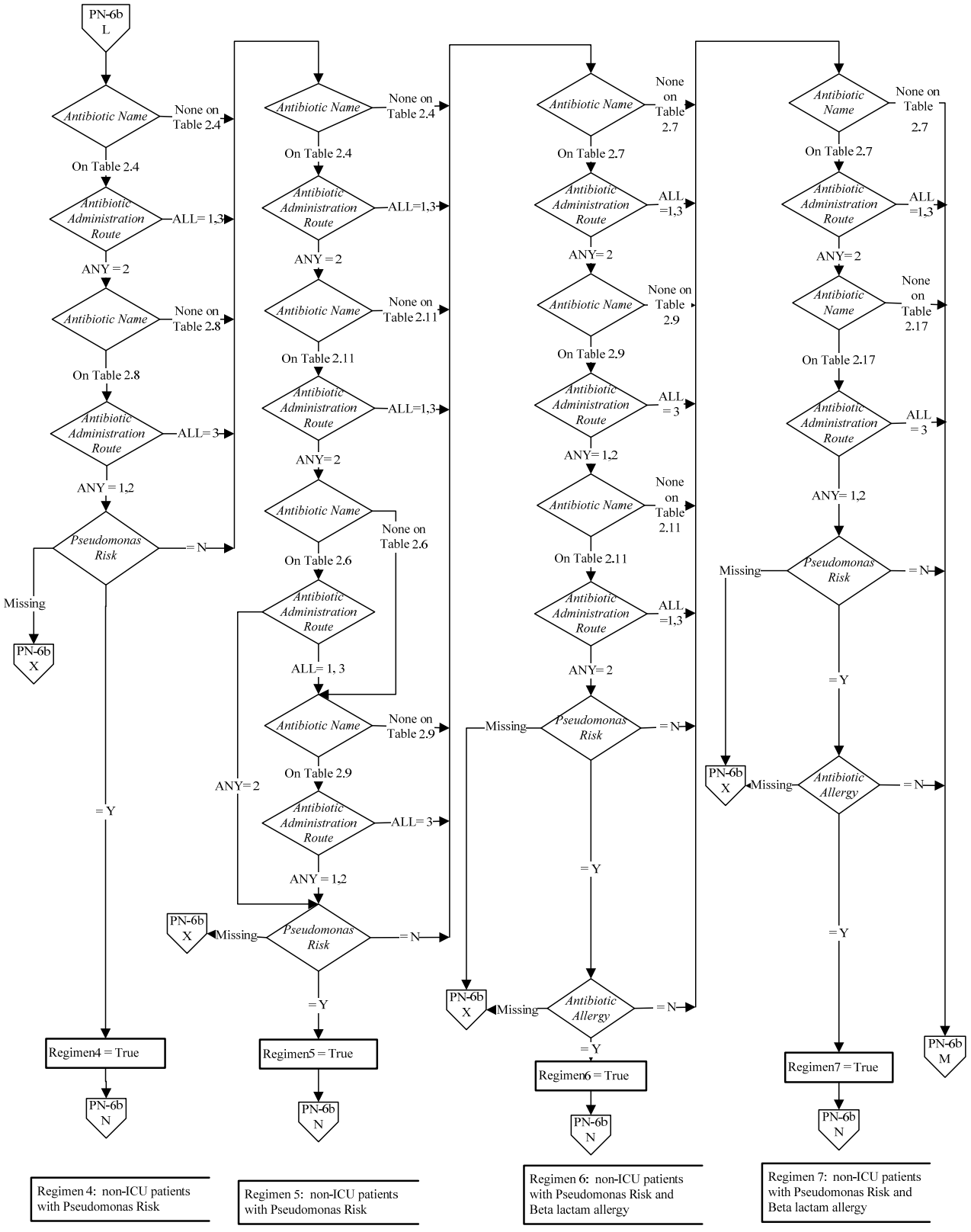
Variable Key:
Patient Age
Duration of Stay
Antibiotic Days
Abxday flag
ANTIMINUTES
Regimen1
Regimen2
Regimen3
Regimen4
Regimen5
Regimen6
Regimen7

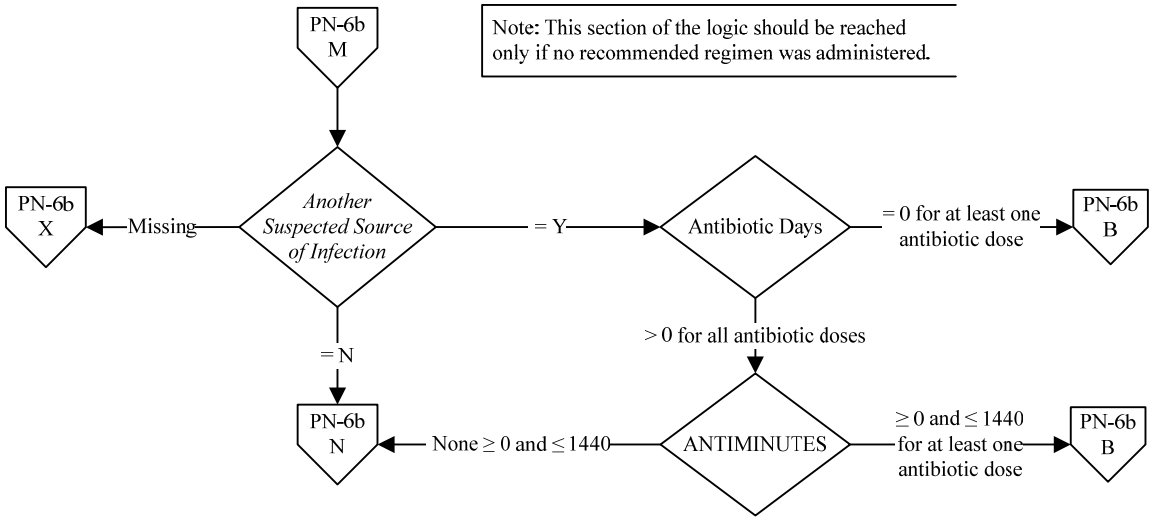

PN-6b H
Initialize Variables
Regimen1 = False
Regimen2 = False
Regimen3 = False
Regimen4 = False
Regimen5 = False
Regimen6 = False
Regimen7 = False
Transfer From Another ED
Missing
PN-6b X
= Y
PN-6b B
= N
Point of Origin for Admission or Visit
= 4, D, E
PN-6b B
= 1, 2, 5, 6, 7, 8, 9, F
Pneumonia Diagnosis: ED/ Direct Admit
Missing
PN-6b X
= 3
PN-6b B
= 1,2 or 4
ICU Transfer/ Admission Within First 24 Hours
Missing
PN-6b X
= 1,3
PN-6b B
= 2
Pneumonia Diagnosis: ED/ Direct Admit
= 4
PN-6b D
= 1 or 2
Identified Pathogen
Missing
PN-6b X
=Y
PN-6b B
=N
Healthcare Associated PN
Missing
PN-6b X
= Y
PN-6b B
= N
Compromised
Missing
PN-6b X
= 1, 2, 3
PN-6b B
= 4
PN-6b I

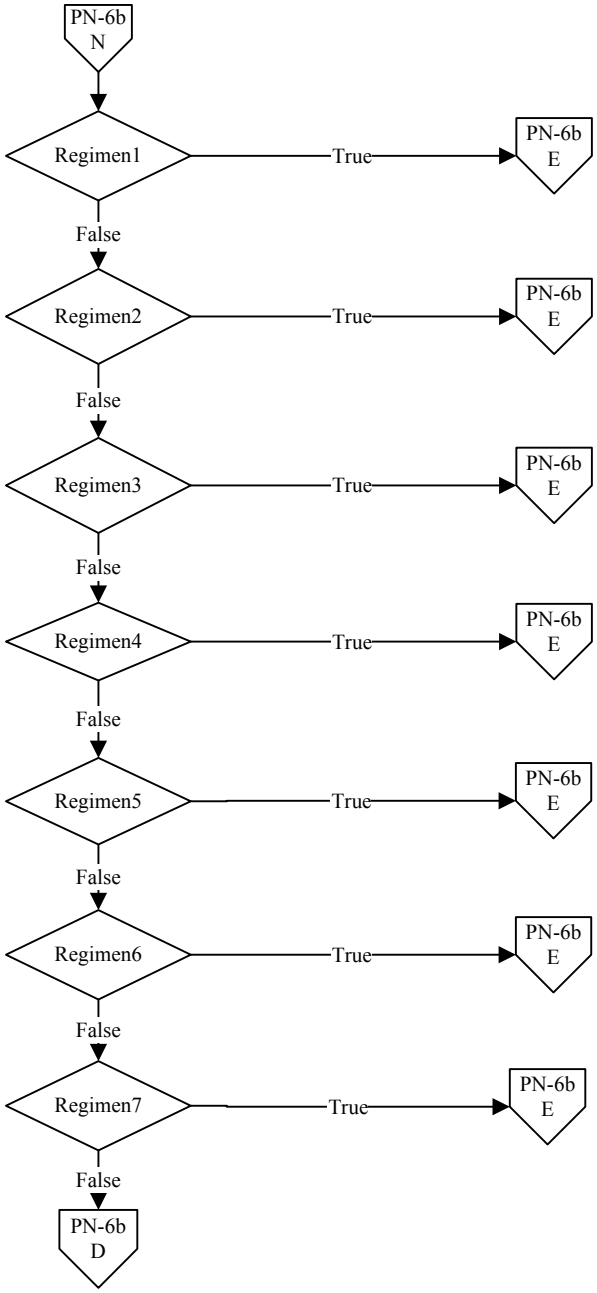

PN-6b I
Antibiotic Received
Missing
PN-6b X
= 1 or 4
PN-6b B
= 2 or 3
Arrival Date
Missing
PN-6b X
=UTD
PN-6b D
Non-UTD Value
Duration of Stay (in days) = Discharge Date – Arrival Date
Duration of Stay
≤1
Discharge Status
=02,07, 20, 43,66
PN-6b B
>1
=01,03,04,05,06, 50,51,61,62,63,64,65, 70
Antibiotic Name
Antibiotic Grid Not Populated
PN-6b X
On Table 2.1
Antibiotic Administration Route
= 10 for all Antibiotic doses
PN-6b D
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'.
=1,2,3 for any antibiotic dose
For each case, include for further processing only those antibiotic doses that are on Table 2.1 and whose associated route = 1, 2, or 3.
PN-6b J

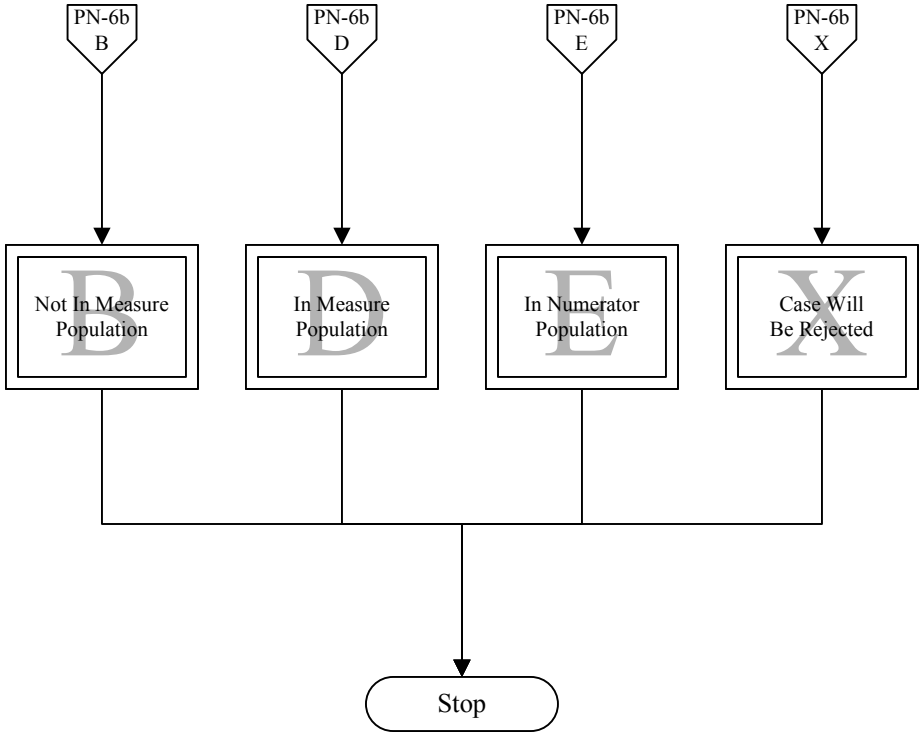

PN-6b J
Antibiotic Administration Date
=UTD for all antibiotic doses
PN-6b D
Non-UTD Value for at least one antibiotic dose
Antibiotic Days = *Antibiotic Administration Date – Arrival Date* (in days)
Calculate Antibiotic Days for each antibiotic dose that has a non-UTD date.
Proceed only with antibiotic doses that have non-UTD *Antibiotic Administration Dates.*
PN-6b X
< 0 for ANY antibiotic dose
Antibiotic Days
None < 0 for ANY antibiotic dose
Antibiotic Days
= 0 for **ALL** antibiotic doses
PN-6b K
> 0 for **ANY** antibiotic dose
Initialize Abxday flag = 'No' for each antibiotic doses.
Set Abxday flag = 'Yes' for each antibiotic dose where Antibiotic Days = 0.
PN-6b X
Missing
Arrival Time
=UTD
Abxday flag
= No for all doses
PN-6b D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
Non-UTD Value
Antibiotic Administration Time
=UTD for all antibiotic doses
Abxday flag
= No for all doses
PN-6b D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
Non-UTD Value for at least one antibiotic dose.
ANTIMINUTES = *Antibiotic Administration Date* and *Antibiotic Administration Time - Arrival Date* and *Arrival Time* (in minutes)
Calculate ANTIMINUTES for each antibiotic dose that has a non-UTD date and time combination.
Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
PN-6b X
< 0 for ANY antibiotic dose
ANTIMINUTES
None < 0 for ANY Antibiotic dose
ANTIMINUTES
> 1440 minutes (24 hours) for all antibiotic doses with non-UTD date and time. Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
Abxday flag
= No for all doses
PN-6b D
=Yes for ANY dose. Proceed with doses where Abxday flag=Yes.
≥ 0 and ≤ 1440 minutes for at least one antibiotic dose
Proceed with antibiotic doses that have ANTIMINUTES calculated, OR Abxday flag = Yes.
For each case, proceed **ONLY** with those antibiotic doses that satisfy **at least** one of the following conditions:
Abxday flag = Y
ANTIMINUTES ≥ 0 and ≤ 1440
PN-6b K


The Patient Age is calculated from *Admission Date – Birthdate* as part of the Initial Patient Population logic
Note: When checking for route of antibiotic, check ONLY for the corresponding antibiotic. For example if an antibiotic on Table 2.9 was received by the patient check if route was appropriate for that antibiotic only.
PN-6b K
Antibiotic Name
None on Table 2.9
On Table 2.9
Antibiotic Administration Route
ALL= 3
ANY = 1, 2
Regimen1 = True
PN-6b N
Regimen 1: All non-ICU patients
Antibiotic Name
None on Table 2.5
On Table 2.5
Antibiotic Administration Route
ALL = 3
ANY = 1,2
Patient Age
>= 65
< 65
Risk Factors for Drug Resistant Pneumococcus
Missing
PN-6b X
= Y
= N
Regimen2 = True
PN-6b N
Regimen 2: non-ICU patients without Drug Resistant Pneumococcus Risk
Antibiotic Name
None on Table 2.3
On Table 2.3
Antibiotic Administration Route
ALL = 1
ANY = 2, 3
Antibiotic Name
None on Table 2.5 or 2.10
On Table 2.5 or 2.10
Antibiotic Administration Route
ALL = 3
ANY = 1,2
Regimen3 = True
PN-6b N
Regimen 3: All non- ICU patients
PN-6b L


PN-6b L
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL= 1,3
ANY = 2
Antibiotic Name
None on Table 2.8
On Table 2.8
Antibiotic Administration Route
ALL= 3
ANY = 1,2
Pseudomonas Risk
= N
Missing
PN-6b X
= Y
Regimen4 = True
PN-6b N
Regimen 4: non-ICU patients with Pseudomonas Risk
Antibiotic Name
None on Table 2.4
On Table 2.4
Antibiotic Administration Route
ALL=1,3
ANY = 2
Antibiotic Name
None on Table 2.11
On Table 2.11
Antibiotic Administration Route
ALL=1,3
ANY= 2
Antibiotic Name
None on Table 2.6
On Table 2.6
Antibiotic Administration Route
ALL= 1, 3
Antibiotic Name
None on Table 2.9
On Table 2.9
Antibiotic Administration Route
ALL= 3
ANY = 1,2
ANY=2
PN-6b X
Missing
Pseudomonas Risk
= N
= Y
Regimen5 = True
PN-6b N
Regimen 5: non-ICU patients with Pseudomonas Risk
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL =1,3
ANY= 2
Antibiotic Name
None on Table 2.9
On Table 2.9
Antibiotic Administration Route
ALL = 3
ANY= 1,2
Antibiotic Name
None on Table 2.11
On Table 2.11
Antibiotic Administration Route
ALL =1,3
ANY= 2
Missing
Pseudomonas Risk
= N
= Y
PN-6b X
Missing
Antibiotic Allergy
= N
= Y
Regimen6 = True
PN-6b N
Regimen 6: non-ICU patients with Pseudomonas Risk and Beta lactam allergy
Antibiotic Name
None on Table 2.7
On Table 2.7
Antibiotic Administration Route
ALL =1,3
ANY= 2
Antibiotic Name
None on Table 2.17
On Table 2.17
Antibiotic Administration Route
ALL = 3
ANY= 1,2
Missing
Pseudomonas Risk
= N
= Y
PN-6b X
Missing
Antibiotic Allergy
= N
= Y
Regimen7 = True
PN-6b N
PN-6b M
Regimen 7: non-ICU patients with Pseudomonas Risk and Beta lactam allergy


PN-6b M
Note: This section of the logic should be reached only if no recommended regimen was administered.
PN-6b X
Missing
Another Suspected Source of Infection
= Y
Antibiotic Days
= 0 for at least one antibiotic dose
PN-6b B
= N
> 0 for all antibiotic doses
PN-6b N
None ≥ 0 and ≤ 1440
ANTIMINUTES
≥ 0 and ≤ 1440 for at least one antibiotic dose
PN-6b B


PN-6b N
Regimen1
True
PN-6b E
False
Regimen2
True
PN-6b E
False
Regimen3
True
PN-6b E
False
Regimen4
True
PN-6b E
False
Regimen5
True
PN-6b E
False
Regimen6
True
PN-6b E
False
Regimen7
True
PN-6b E
False
PN-6b D


PN-6b
B
PN-6b
D
PN-6b
E
PN-6b
X
B
Not In Measure Population
D
In Measure Population
E
In Numerator Population
X
Case Will Be Rejected
Stop