

**\*\*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
JCAHO	PN-6a	ICU Patients
JCAHO	PN-6b	Non - ICU Patients

Note: CMS data is transmitted as patient level data while JCAHO data is transmitted as aggregate level data. Therefore, in order for JCAHO 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

	<b>PN-6</b>	<b>PN-6a</b>	<b>PN-6b</b>
<b>Included populations</b>	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
<b>Excluded Populations</b>	None	None	None
<b>Data Elements</b>	<i>Antibiotic Administration Date</i> <i>Antibiotic Administration Route</i> <i>Antibiotic Administration Time</i> <i>Antibiotic Allergy</i> <i>Antibiotic Name</i> <i>Arrival Date</i> <i>Arrival Time</i> <i>Pseudomonas Risk</i> <i>Risk Factors for Drug-Resistant Pneumococcus</i>	<i>Antibiotic Administration Date</i> <i>Antibiotic Administration Route</i> <i>Antibiotic Administration Time</i> <i>Antibiotic Allergy</i> <i>Antibiotic Name</i> <i>Arrival Date</i> <i>Arrival Time</i> <i>Pseudomonas Risk</i>	<i>Antibiotic Administration Date</i> <i>Antibiotic Administration Route</i> <i>Antibiotic Administration Time</i> <i>Antibiotic Allergy</i> <i>Antibiotic Name</i> <i>Arrival Date</i> <i>Arrival Time</i> <i>Pseudomonas Risk</i> <i>Risk Factors for Drug-Resistant Pneumococcus</i>

**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 received in transfer from another acute care or critical access hospital, including another emergency department
- Patients who have no working diagnosis of pneumonia at the time of admission

- Patients receiving *Comfort Measures Only*
- Patients who do not receive antibiotics during hospitalization or within 36 hours (2160 minutes) after arrival at the hospital
- Patients who are *Compromised* as defined in the Data Dictionary
- PN patients not in the ICU (PN-6a only)
- PN patients in ICU (PN-6b only)
- Patients involved in protocols or clinical trials
- Patients with *Healthcare Associated PN* as defined in the Data Dictionary
- Patients who had no chest x-ray or CT scan that indicated positive infiltrate within 24 hours prior to hospital arrival or anytime during this hospitalization

**Data Elements:**

- *Admission Date*
- *Admission Source*
- *Antibiotic Administration Date*
- *Antibiotic Administration Time*
- *Antibiotic Name*
- *Antibiotic Received*
- *Birthdate*
- *Chest X-Ray*
- *Clinical Trial*
- *Comfort Measures Only*
- *Compromised*
- *Healthcare Associated PN*
- *ICD-9-CM Other Diagnosis Codes*
- *ICD-9-CM Principal Diagnosis Code*
- *ICU Transfer or Admission Within First 24 Hours*
- *Pneumonia Working Diagnosis on Admission*
- *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. Patients who receive their initial empiric antibiotic greater than 36 hours from the time of hospital arrival are excluded from the measure. Patients who receive their initial empiric antibiotic greater than 24 hours from the time of hospital arrival will fall into the denominator, but not the numerator, even if the antibiotic was consistent with current recommendations. 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 Sampling Section.

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

**Selected References:**

- Bartlett JG, Dowell SF, Mandell LA, et al. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. *Clin Infect Dis.* 2000;31:347-382.
- 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.
- Niederman MS, Mandell LA, Anzueto A, et al. Guidelines for the management of adults with community-acquired pneumonia. American Thoracic Society. *Am J Respir Crit Care Med.* 2000;163:1730-1754.
- Mandell LA, Bartlett JG, Dowell SF, et al. Practice guidelines for the management of community-acquired pneumonia in adults. Infectious Diseases Society of America. *Clin Infect Dis.* 2003;37:1405-1433.
- 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.

### Pneumonia Antibiotic Consensus Recommendations

Non-ICU Patient	ICU Patient	Pseudomonal Risk*
<p><b>β-lactam (IV or IM) Table 2.3 + macrolide (IV or oral) Table 2.5</b></p> <p>Or</p> <p><b>Quinolone monotherapy (IV or oral) Table 2.9</b></p> <p>Or</p> <p><b>β-lactam (IV or IM) Table 2.3 + doxycycline (IV or oral) Table 2.10</b></p> <p>Or</p> <p>If less than 65 with no <i>Risk Factors for Drug-Resistant Pneumococcus</i> (see data element)  Macrolide monotherapy (IV or oral) Table 2.5</p> <p>β-lactam = ceftriaxone, cefotaxime, ampicillin-sulbactam, ertapenem</p> <p>Macrolide = erythromycin, clarithromycin, azithromycin</p> <p>Quinolones = levofloxacin, gatifloxacin, moxifloxacin, gemifloxacin</p>	<p><b>β-lactam (IV) Table 2.3 + macrolide (IV) Table 2.6</b></p> <p>Or</p> <p><b>β-lactam (IV) Table 2.3 + quinolone (IV) Table 2.9</b></p> <p>Or</p> <p><b>If documented β-lactam allergy: Quinolone (IV) Table 2.9 +/- Clindamycin* (IV) Table 2.12</b></p> <p>β-lactam = ceftriaxone, cefotaxime, ampicillin-sulbactam, ertapenem</p> <p>Macrolide = erythromycin, azithromycin</p> <p>Quinolones = levofloxacin, gatifloxacin, moxifloxacin</p> <p>*Clindamycin is optional</p>	<p>These antibiotics would also be acceptable for ICU and Non-ICU patients with pseudomonal risk</p> <p><b>IV antipseudomonal β-lactam Table 2.4 + IV antipseudomonal quinolone Table 2.8</b> (PO quinolone is allowed for Non-ICU only)</p> <p>Or</p> <p><b>IV antipseudomonal β-lactam Table 2.4 + IV aminoglycoside Table 2.11 + either IV antipneumococcal quinolone Table 2.9 Or IV macrolide Table 2.6</b> (PO quinolone is allowed for Non-ICU only)</p> <p>Or</p> <p><b>If documented β-lactam allergy: Aztreonam Table 2.7 + antipneumococcal quinolone Table 2.9 +/- aminoglycoside* Table 2.11</b> (PO quinolone is allowed for Non-ICU only)</p> <p>Antipseudomonal quinolone = ciprofloxacin, levofloxacin</p> <p>Antipseudomonal β-lactam = cefepime, imipenem, meropenem, piperacillin-tazobactam, piperacillin</p> <p>Aminoglycoside = gentamicin, tobramycin, amikacin</p> <p>Antipneumococcal quinolone = levofloxacin**, gatifloxacin, moxifloxacin</p> <p>Macrolide = azithromycin, erythromycin</p> <p>*Aminoglycoside is optional</p>

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 using as an antipneumococcal quinolone for ICU patients with pseudomonal risk.

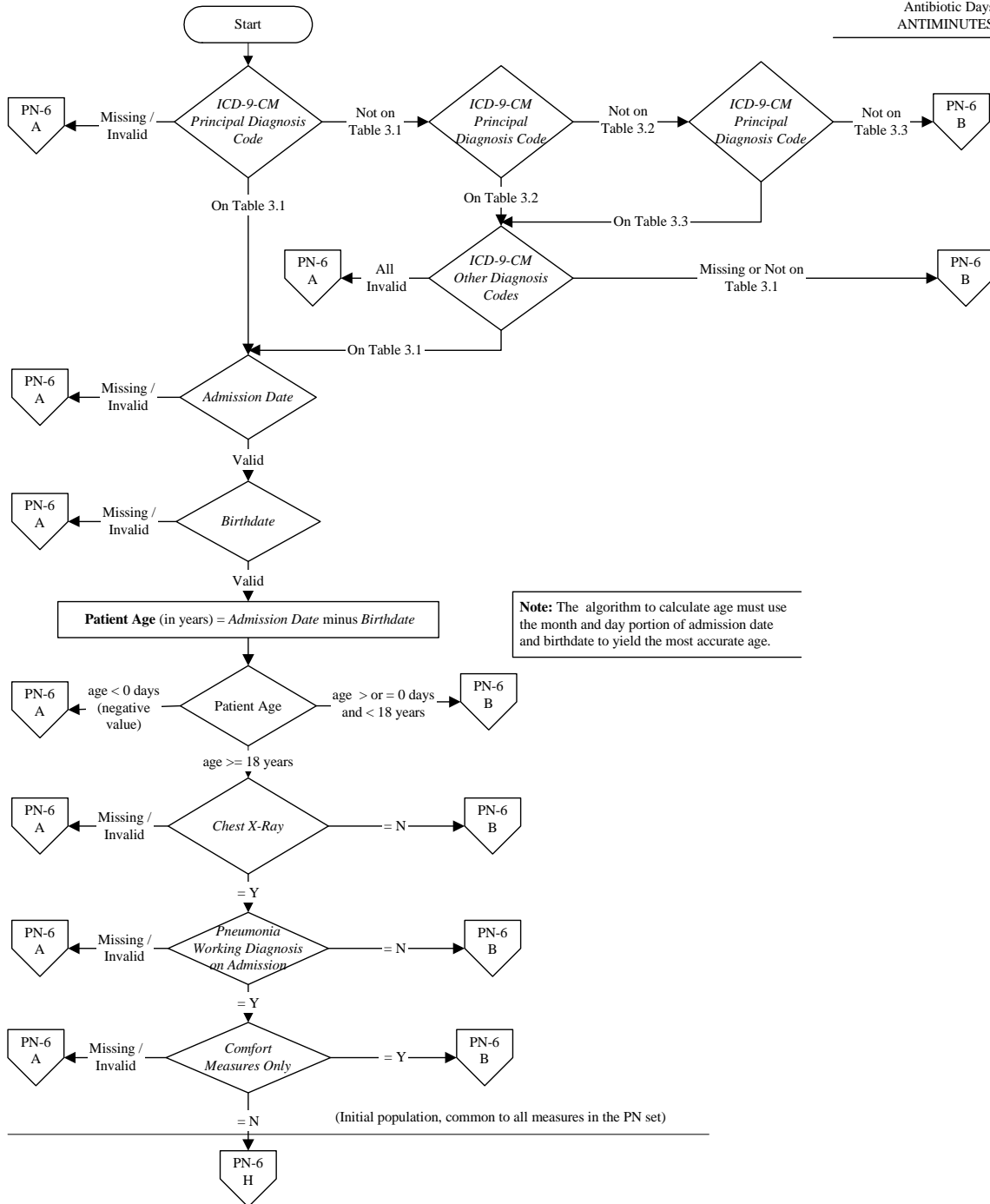
Note: The dosage listed is specified to reflect clinical expert recommendations. We do not collect dosage information for the purposes of the Pneumonia Project.

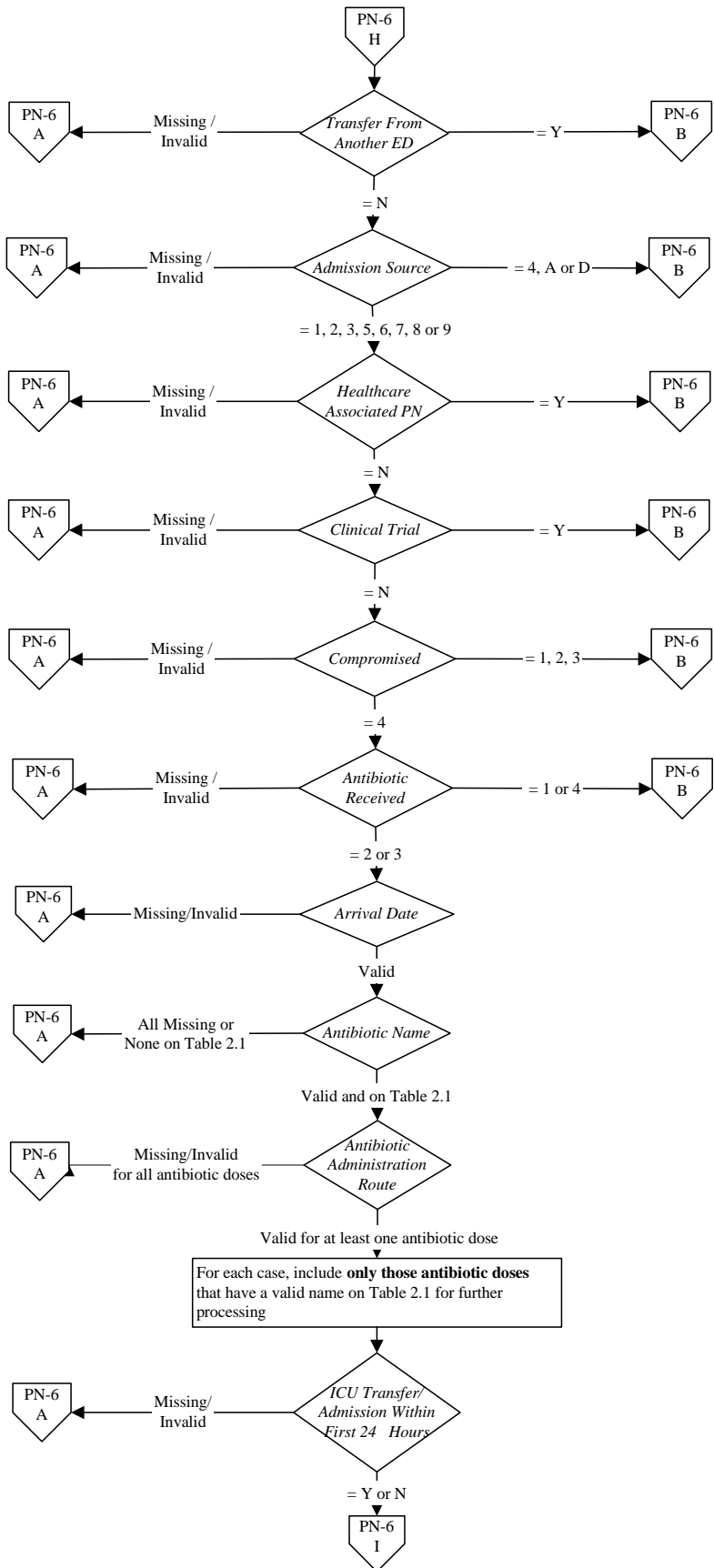
## PN-6: Initial Antibiotic Selection for Community-Acquired Pneumonia (CAP) in Immunocompetent Patients

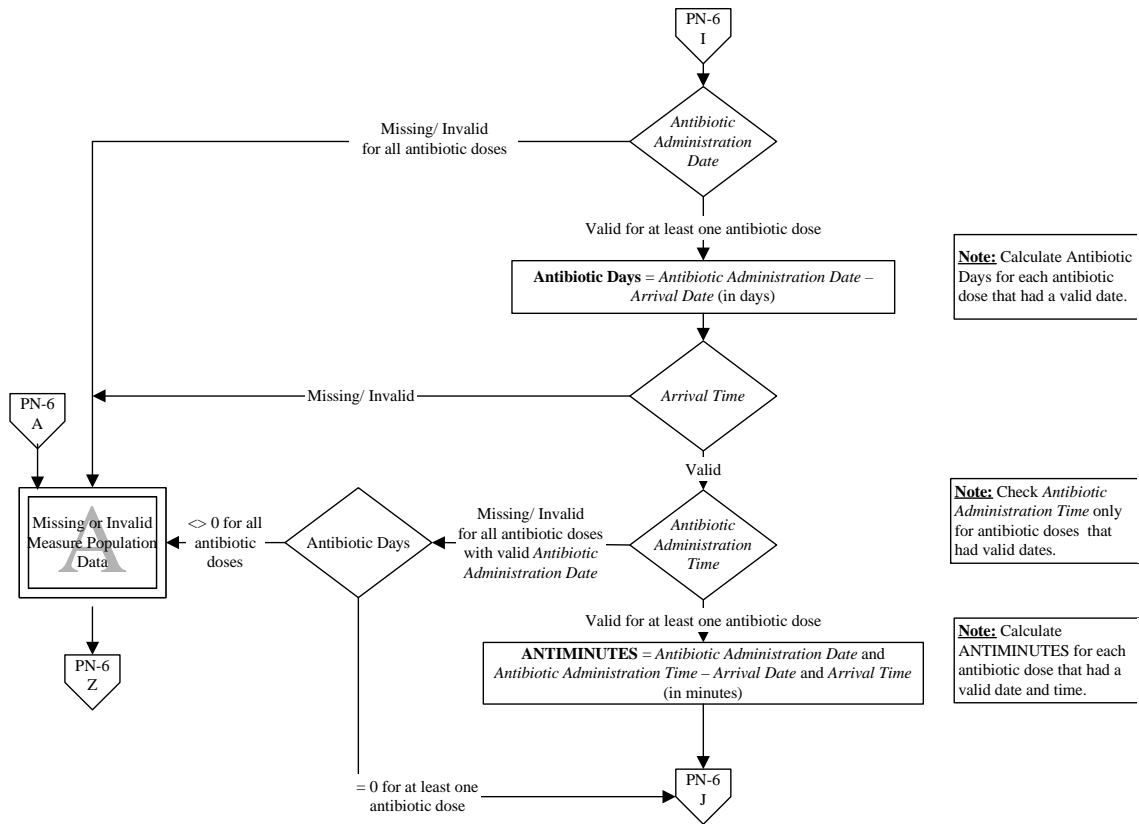
**Numerator:** Pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization

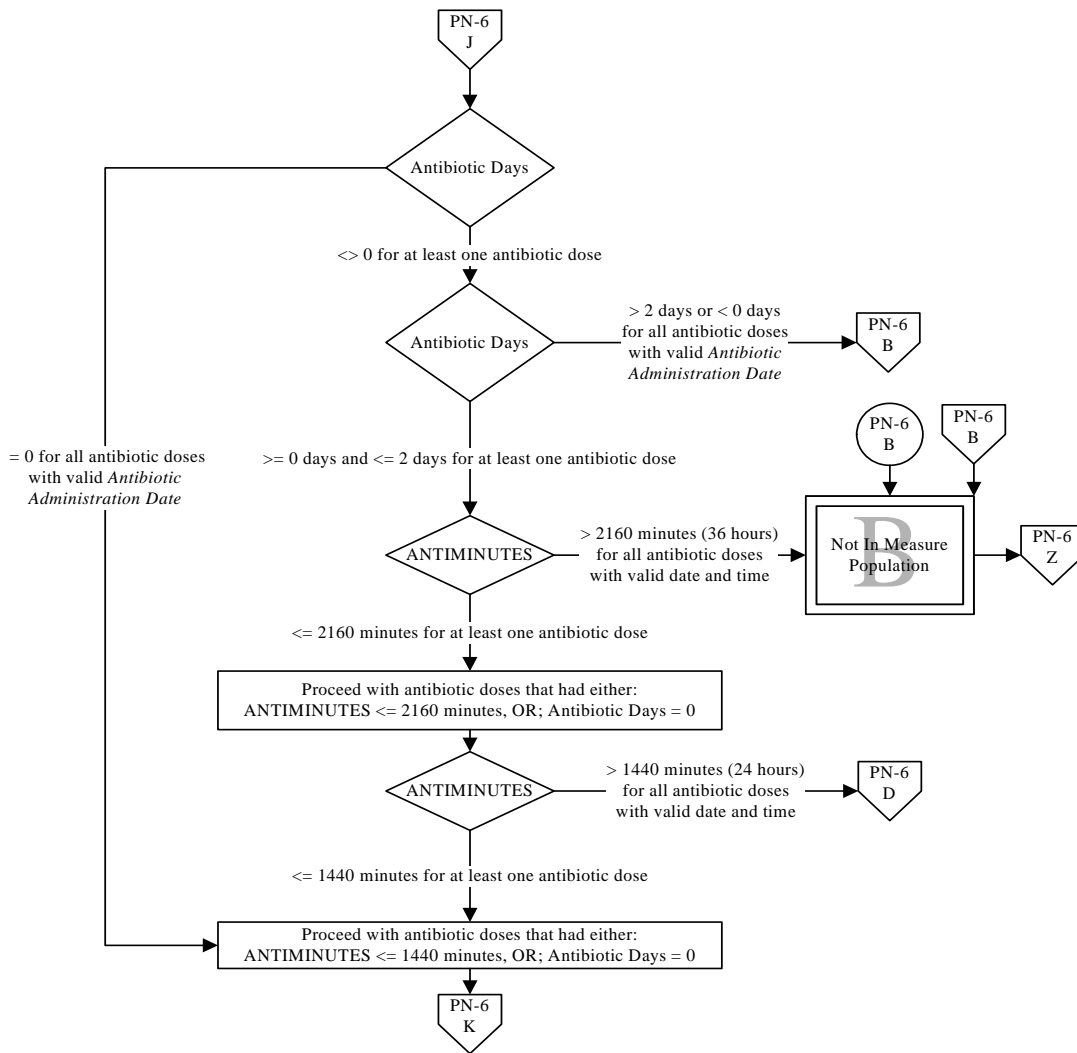
**Denominator:** Pneumonia patients 18 years of age and older.

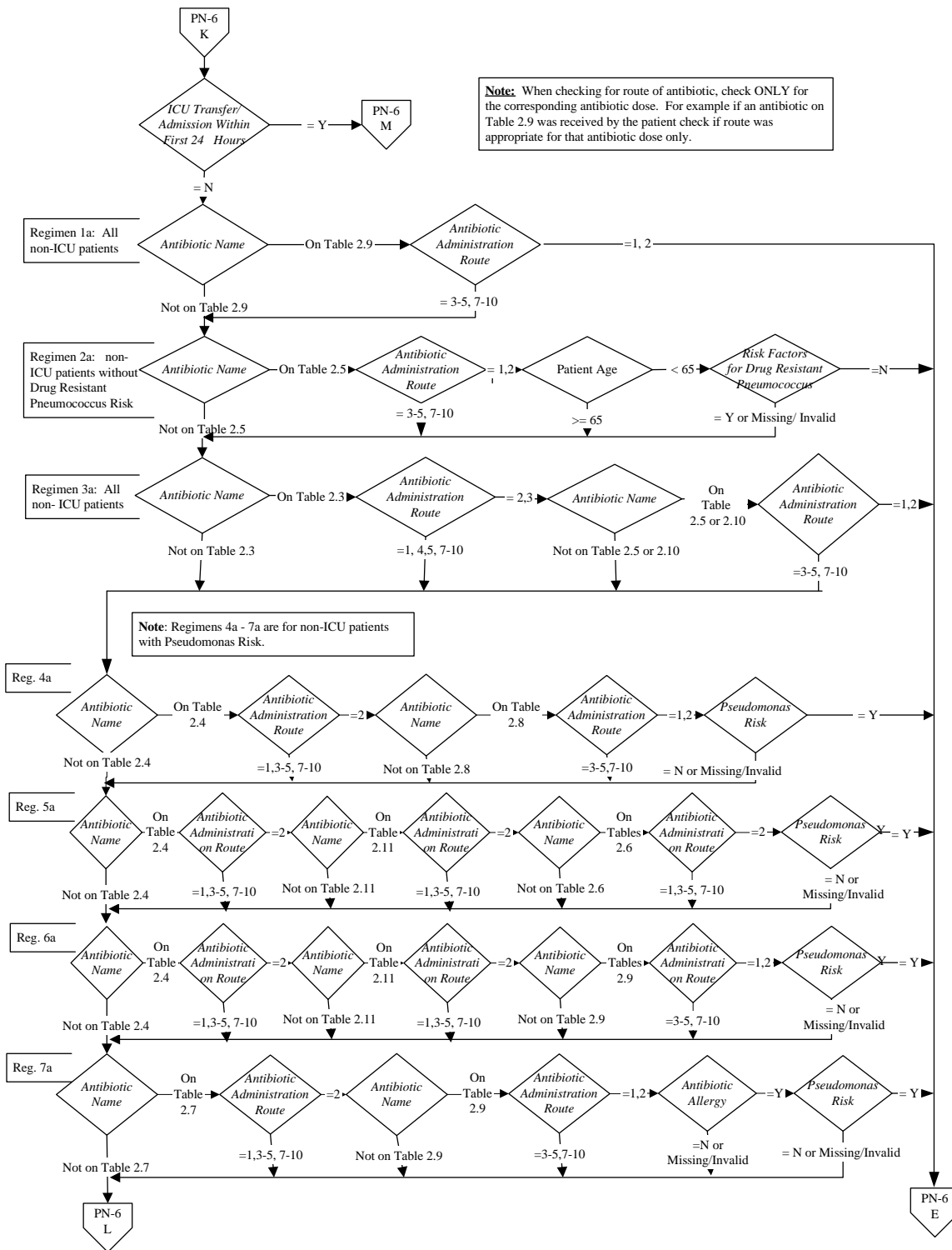
**Variable Key:**  
 Patient Age  
 Antibiotic Days  
 ANTIMINUTES

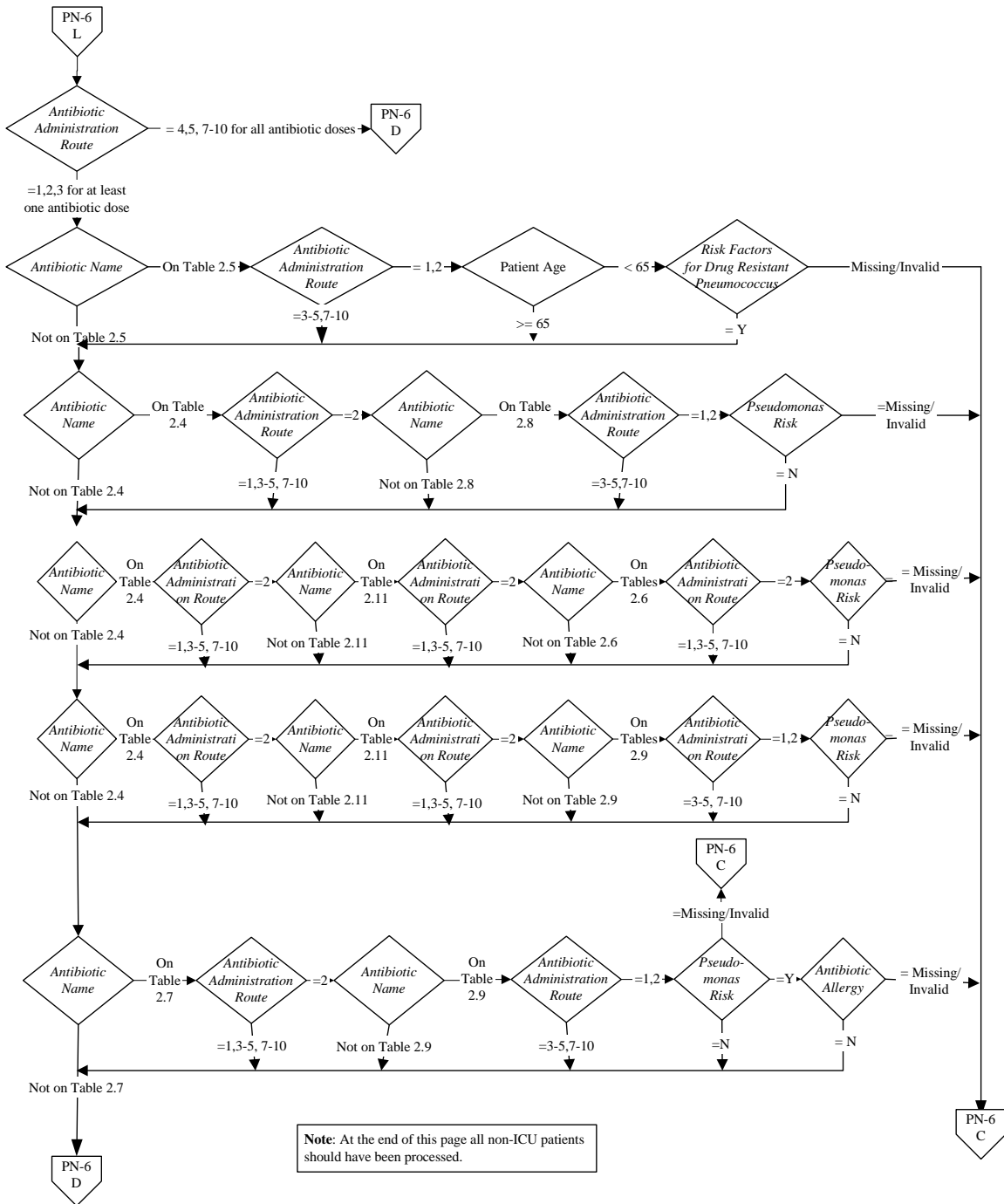


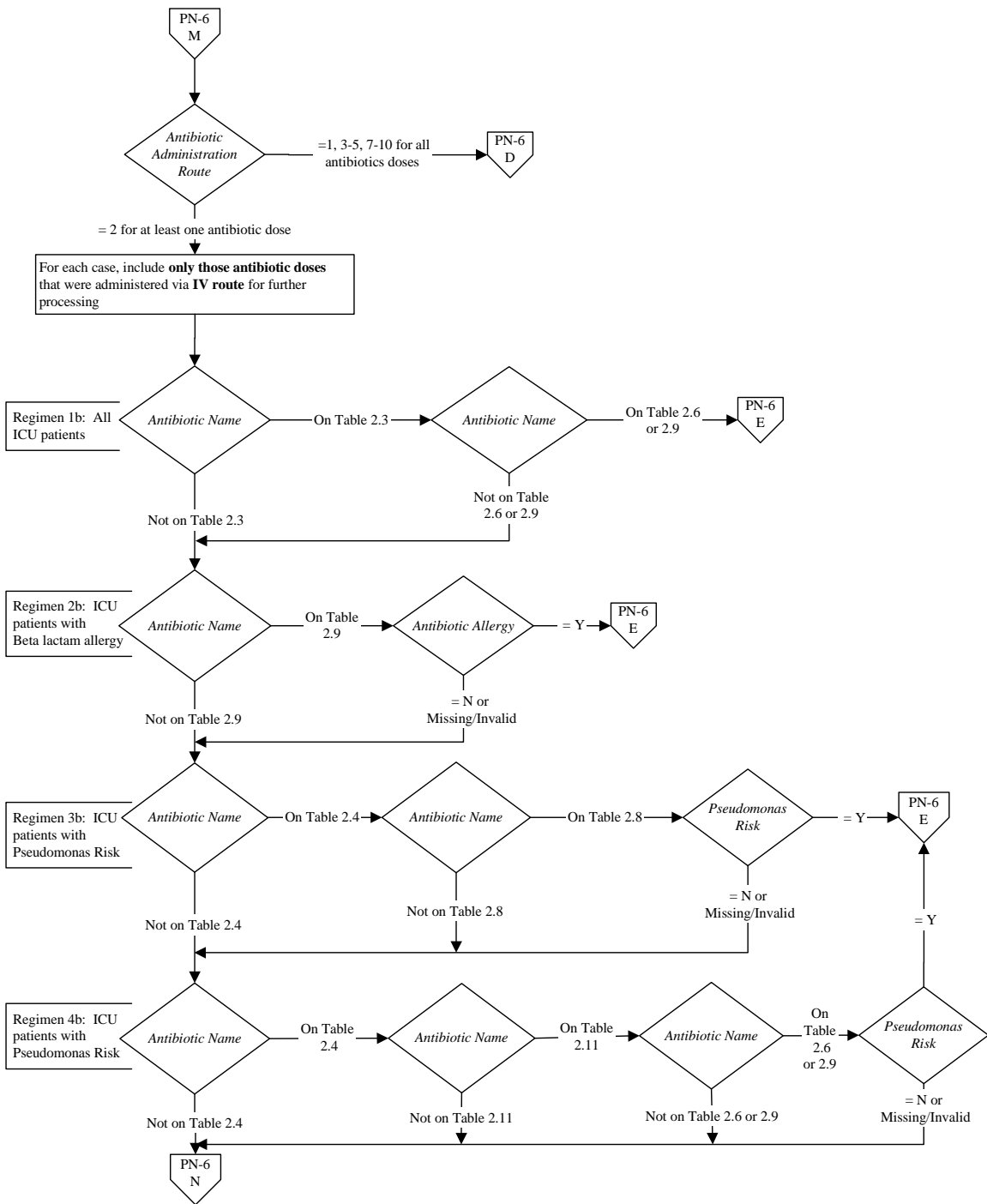


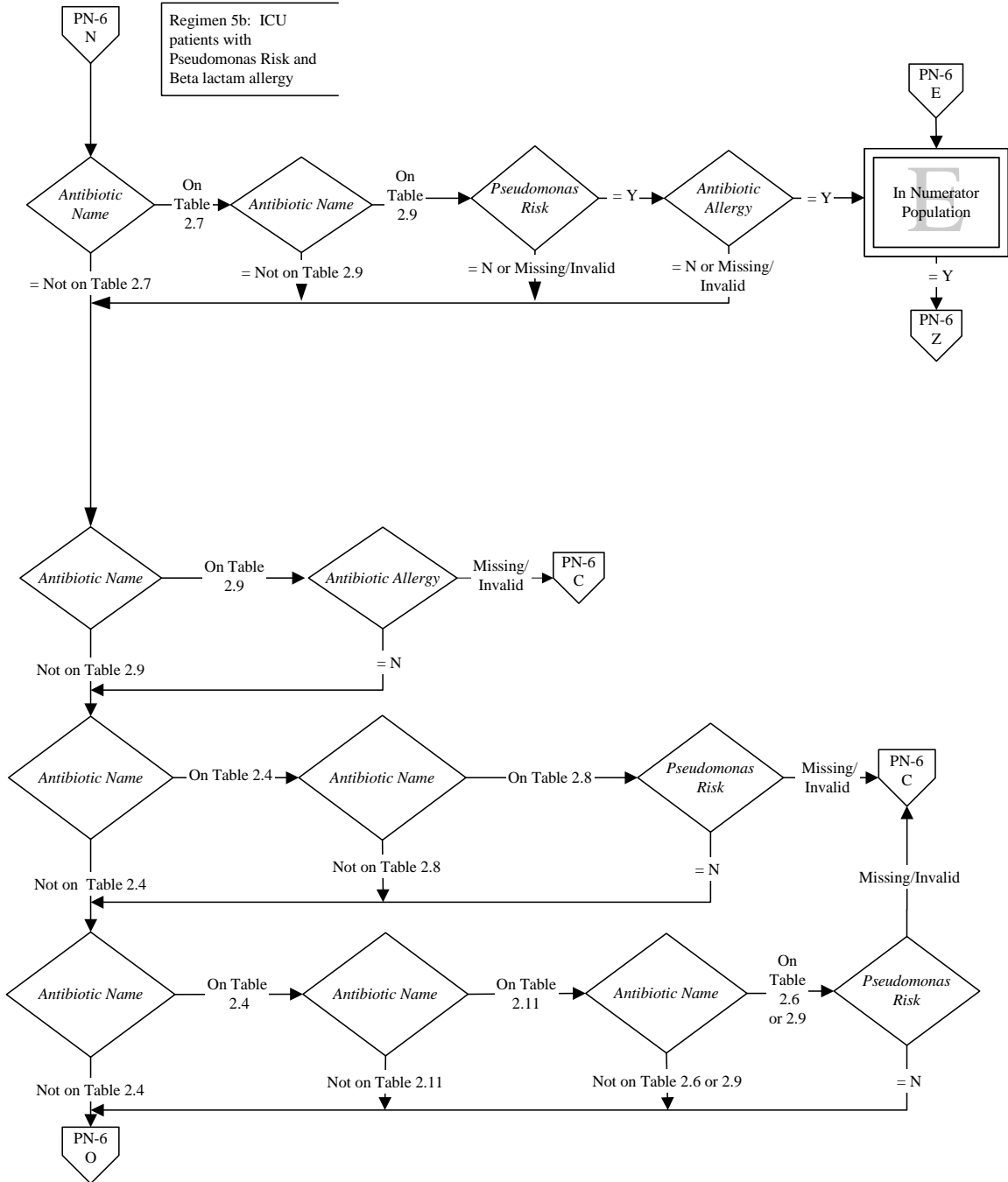












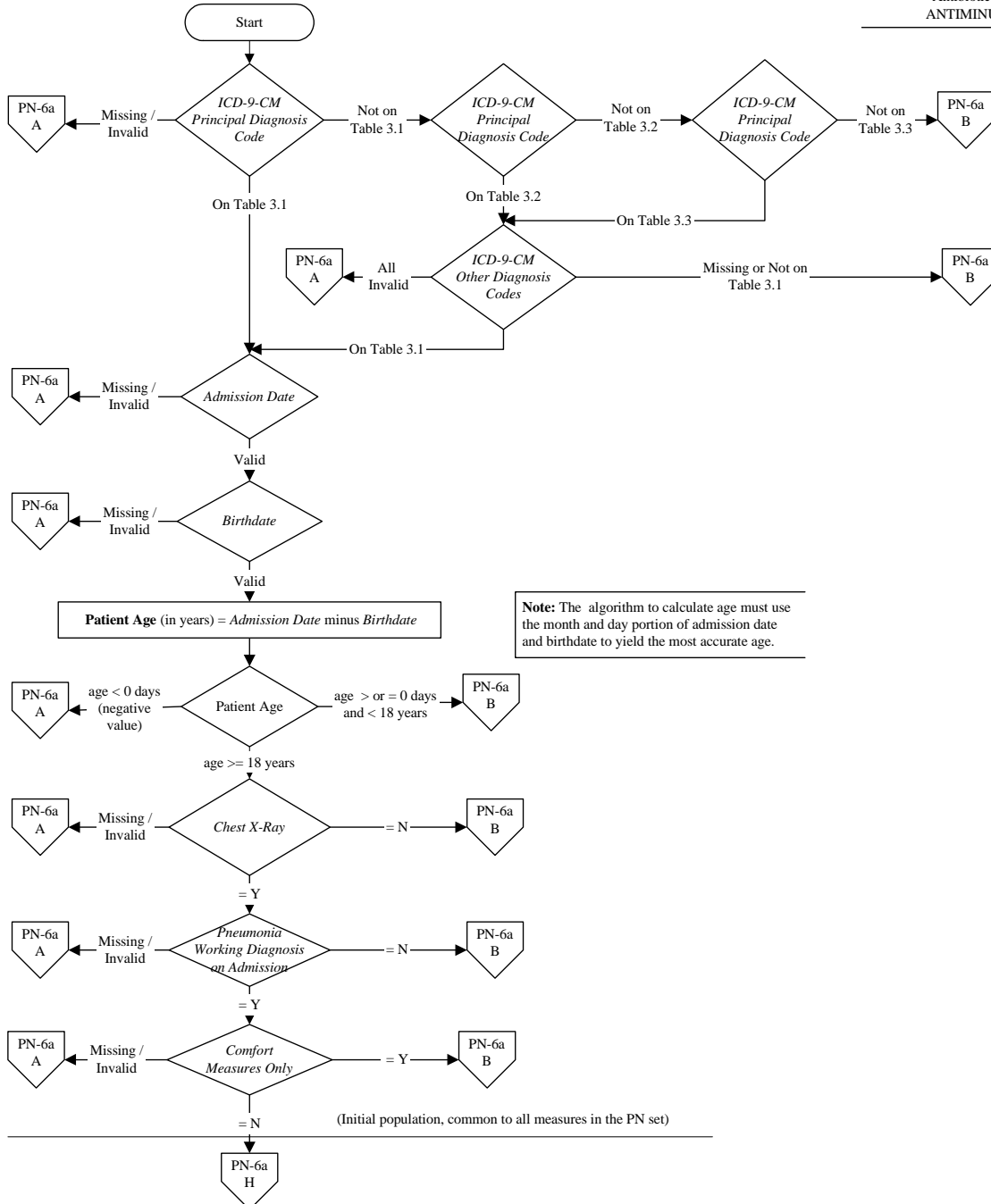


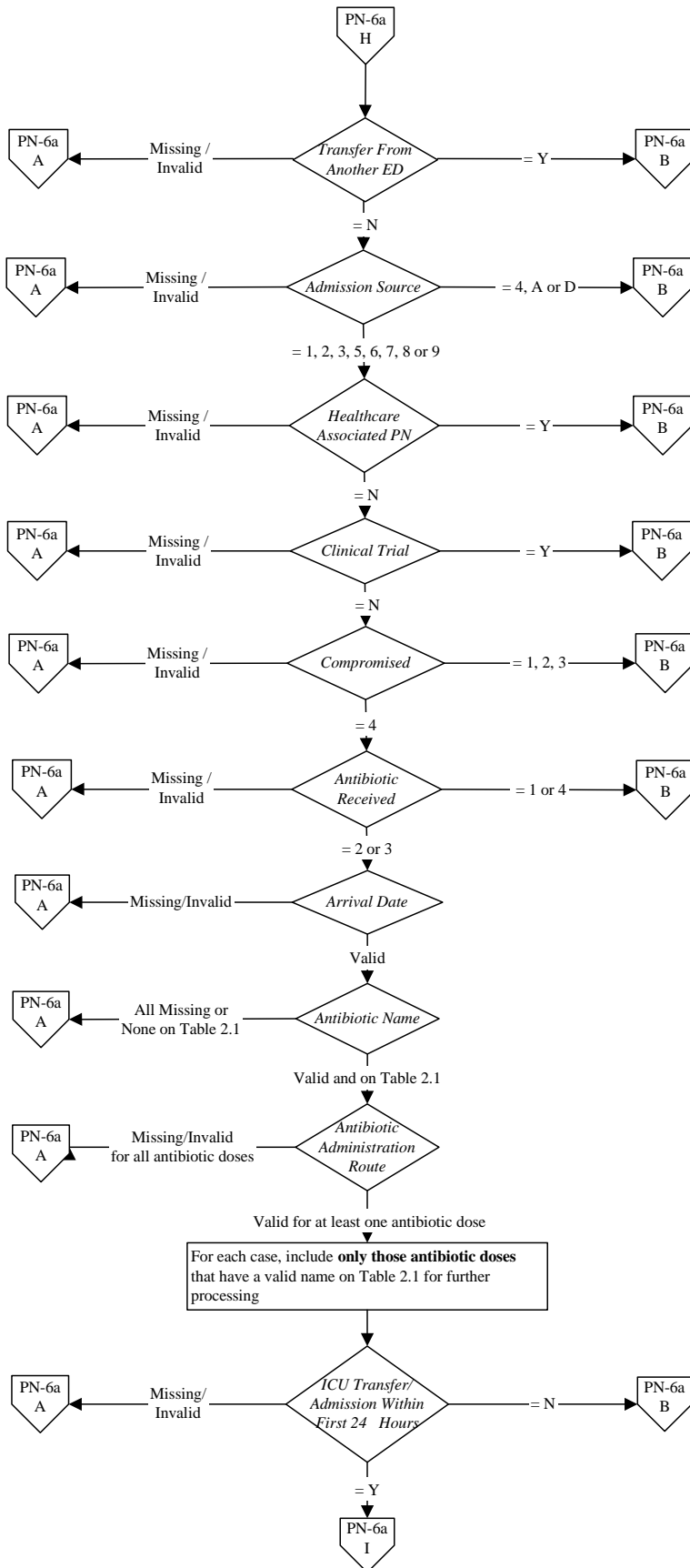
## PN-6a: Initial Antibiotic Selection For Community-Acquired Pneumonia (CAP) In Immunocompetent Patients -Intensive Care Unit (ICU) Patients

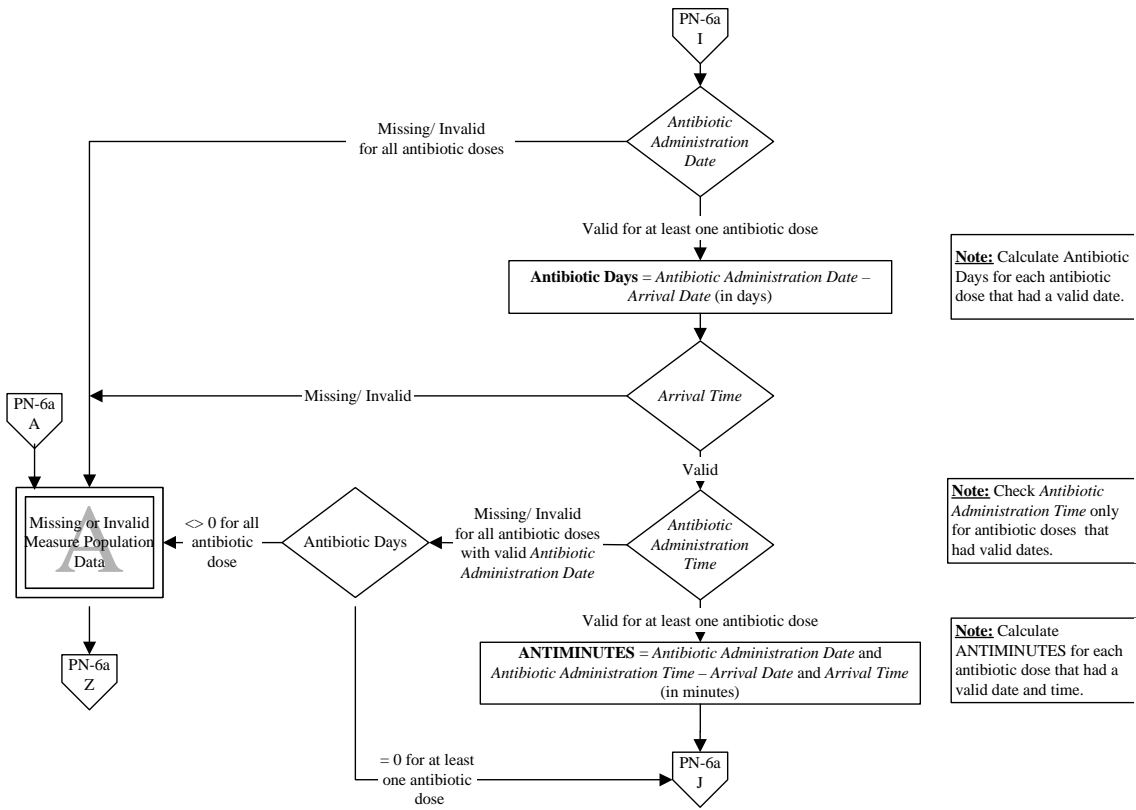
**Numerator:** ICU pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization

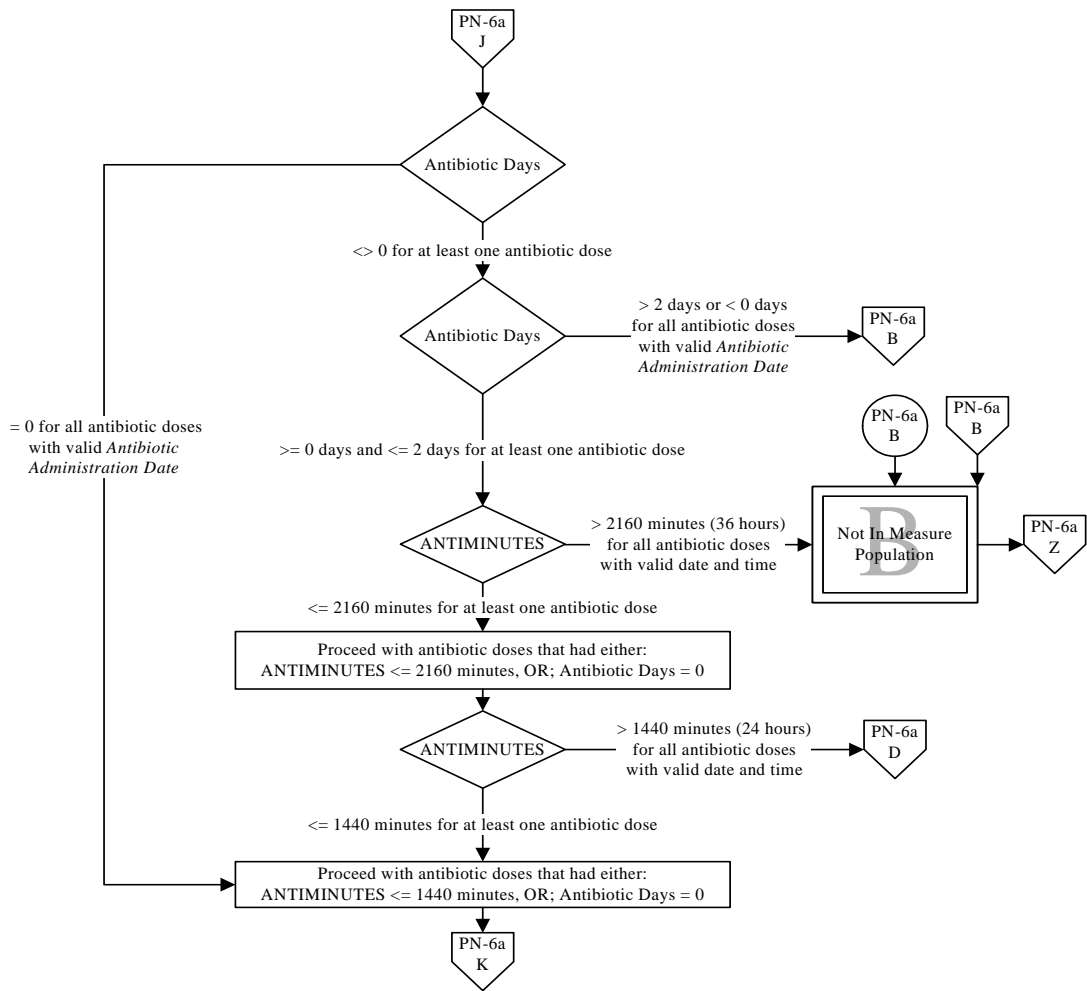
**Denominator:** ICU pneumonia patients 18 years of age and older.

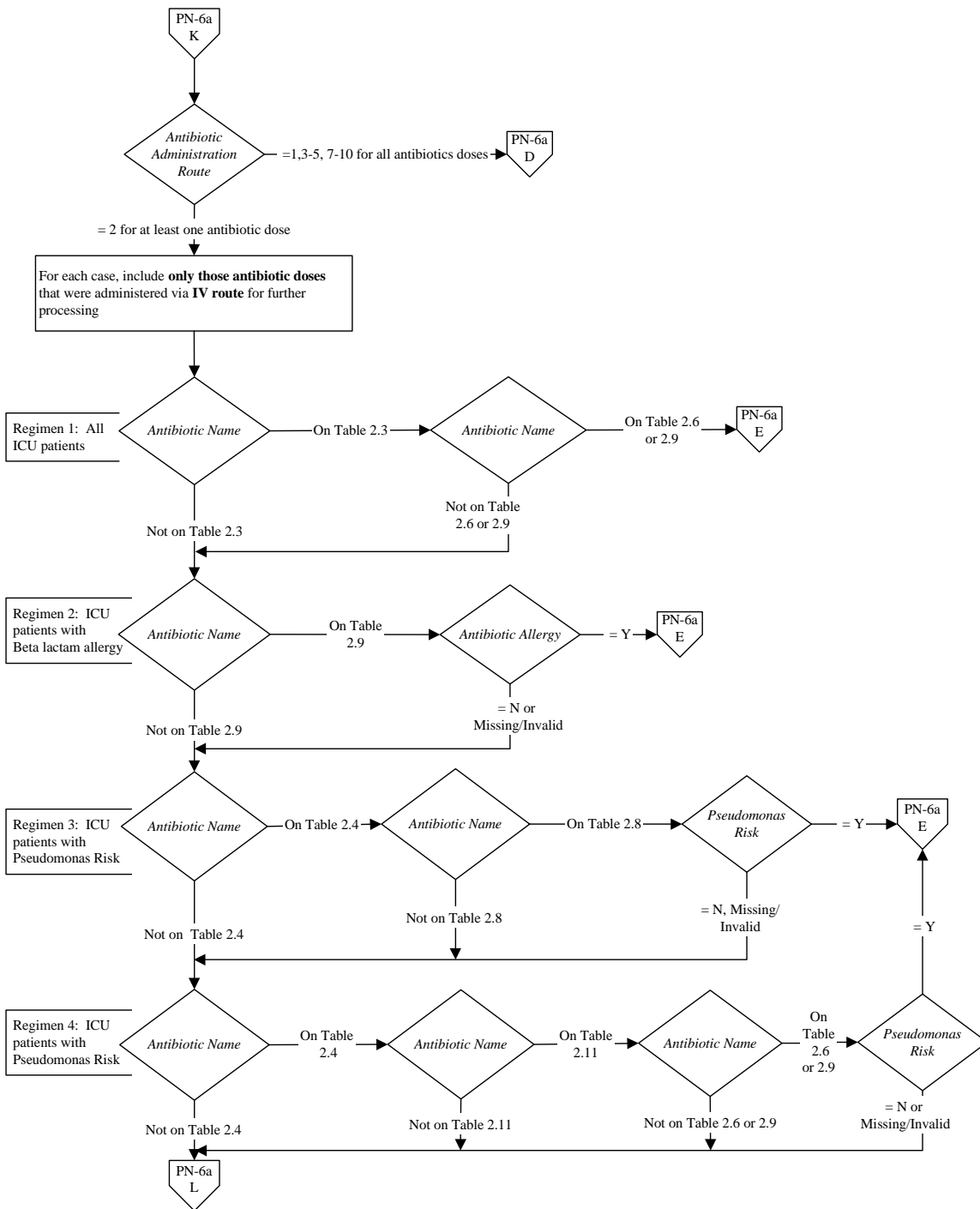
**Variable Key:**  
 Patient Age  
 Antibiotic Days  
 ANTIMINUTES

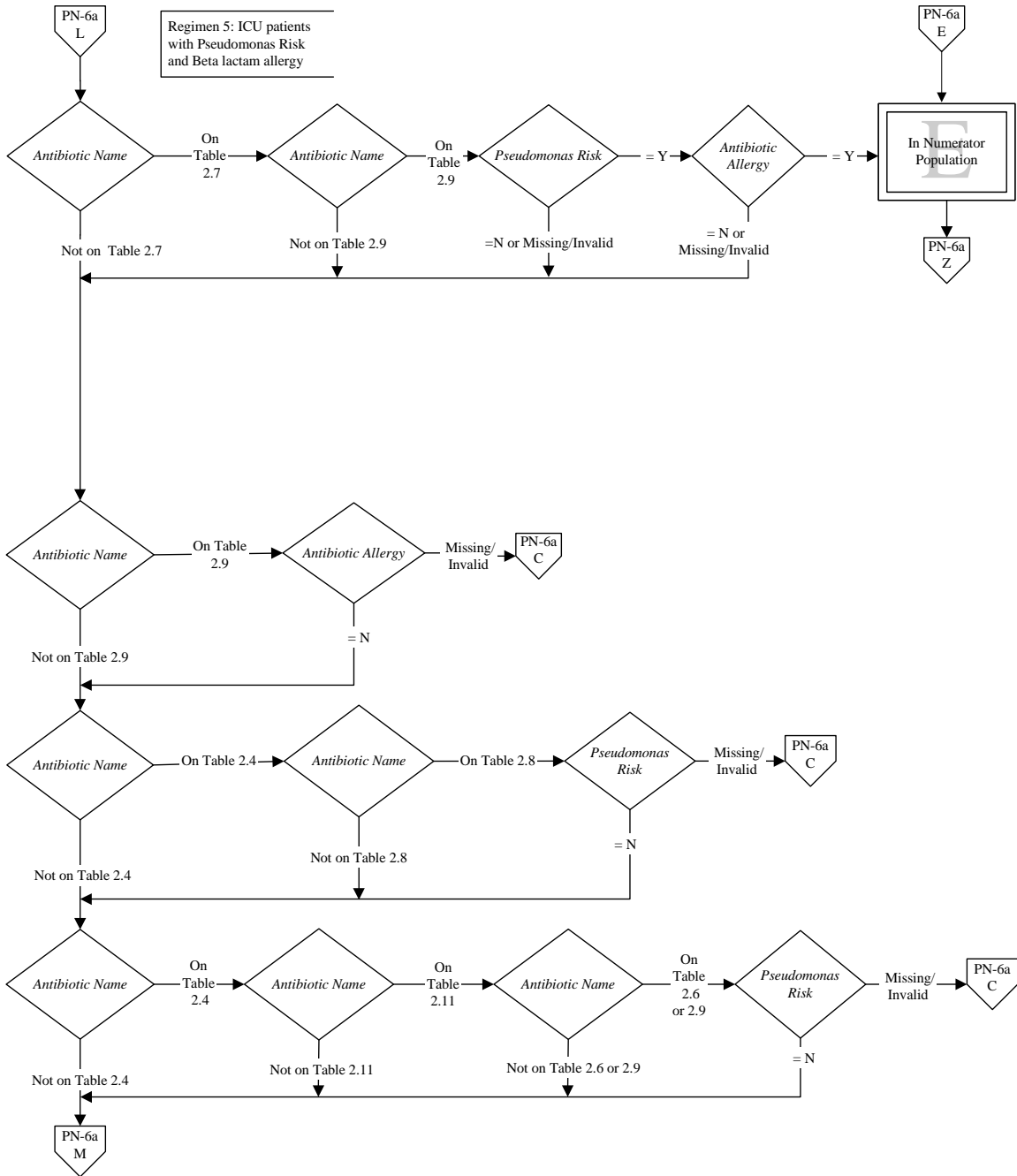


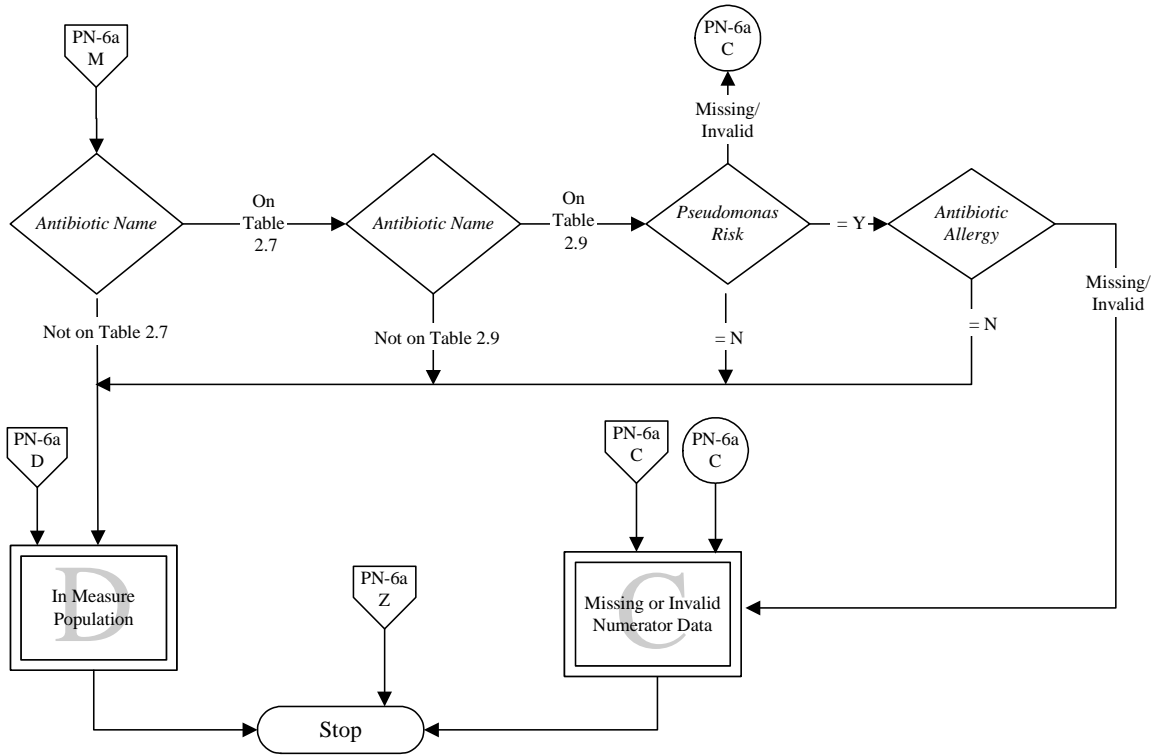








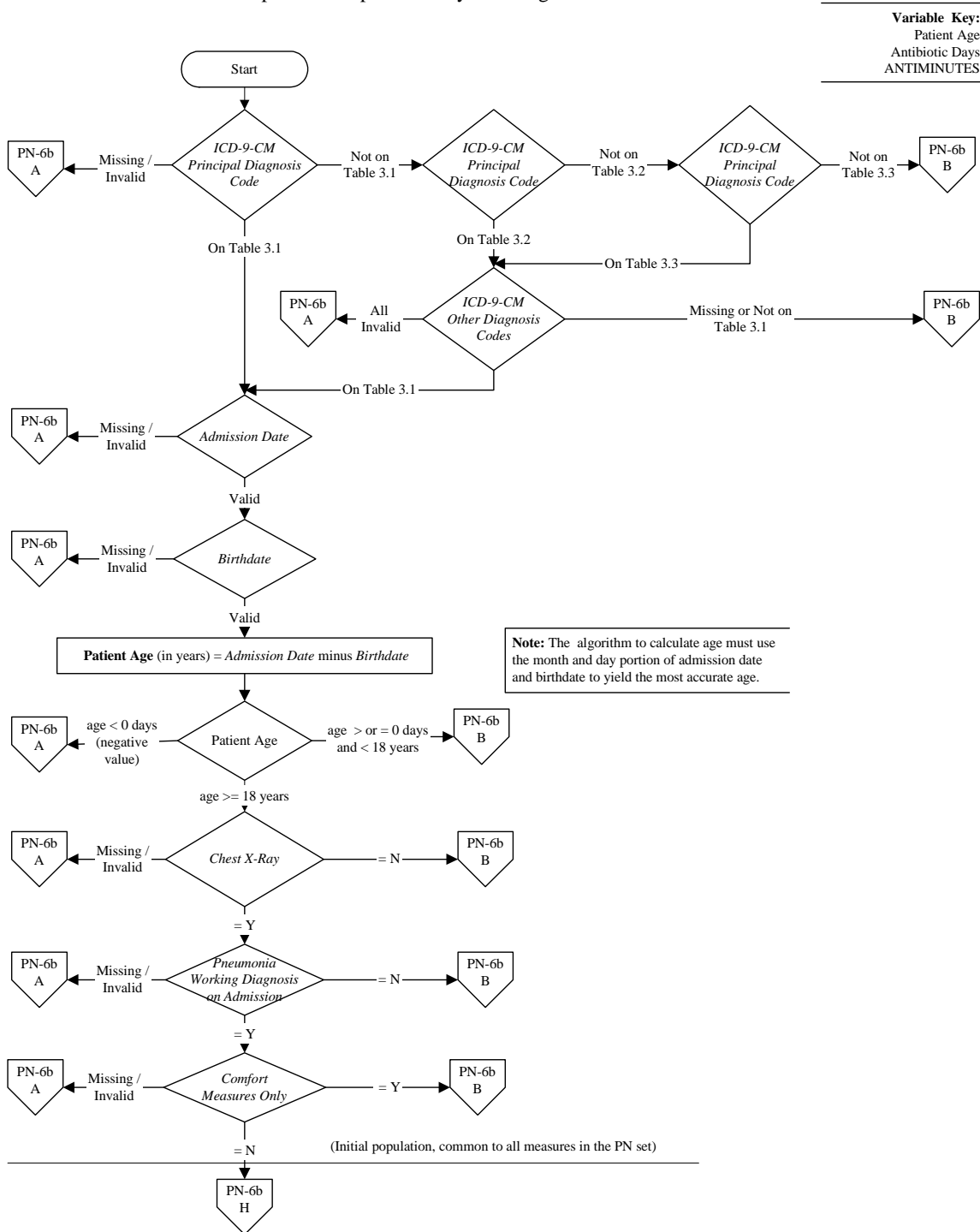


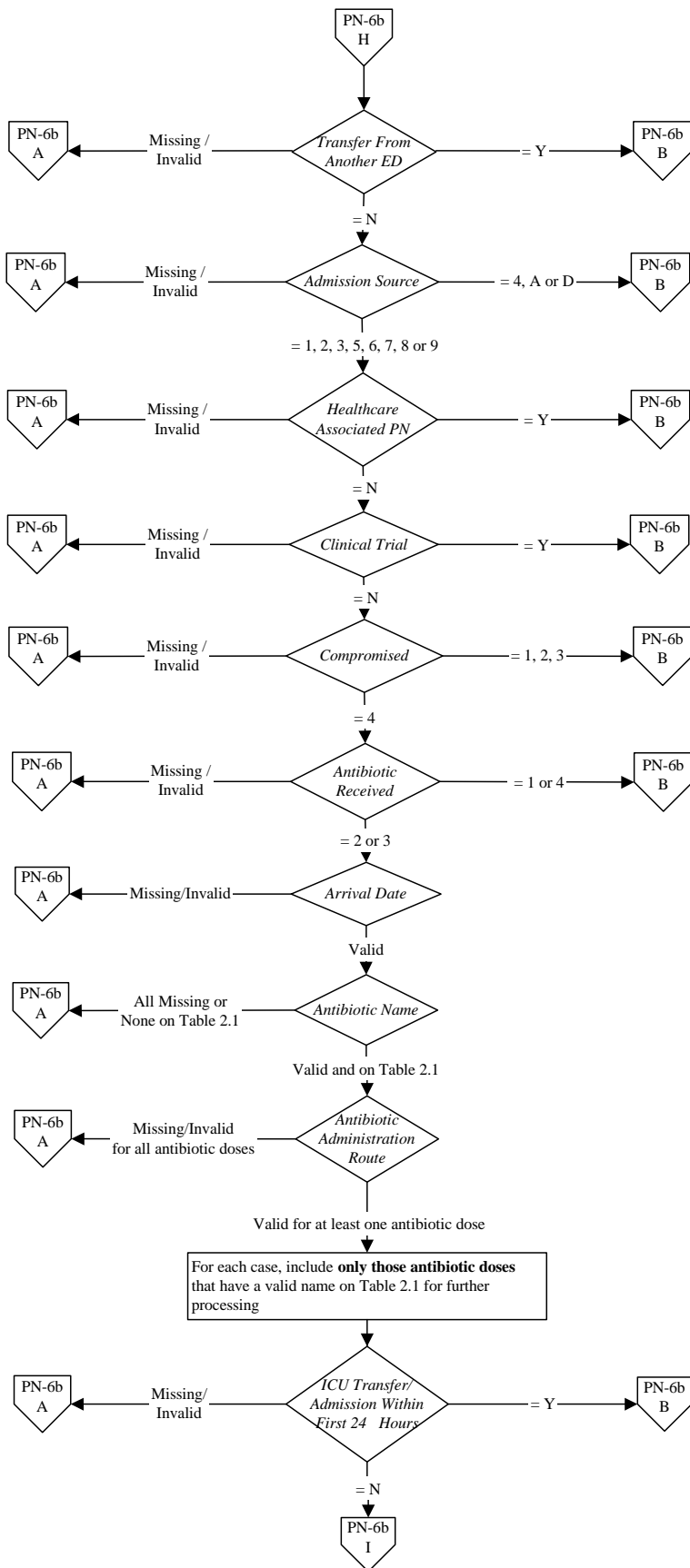


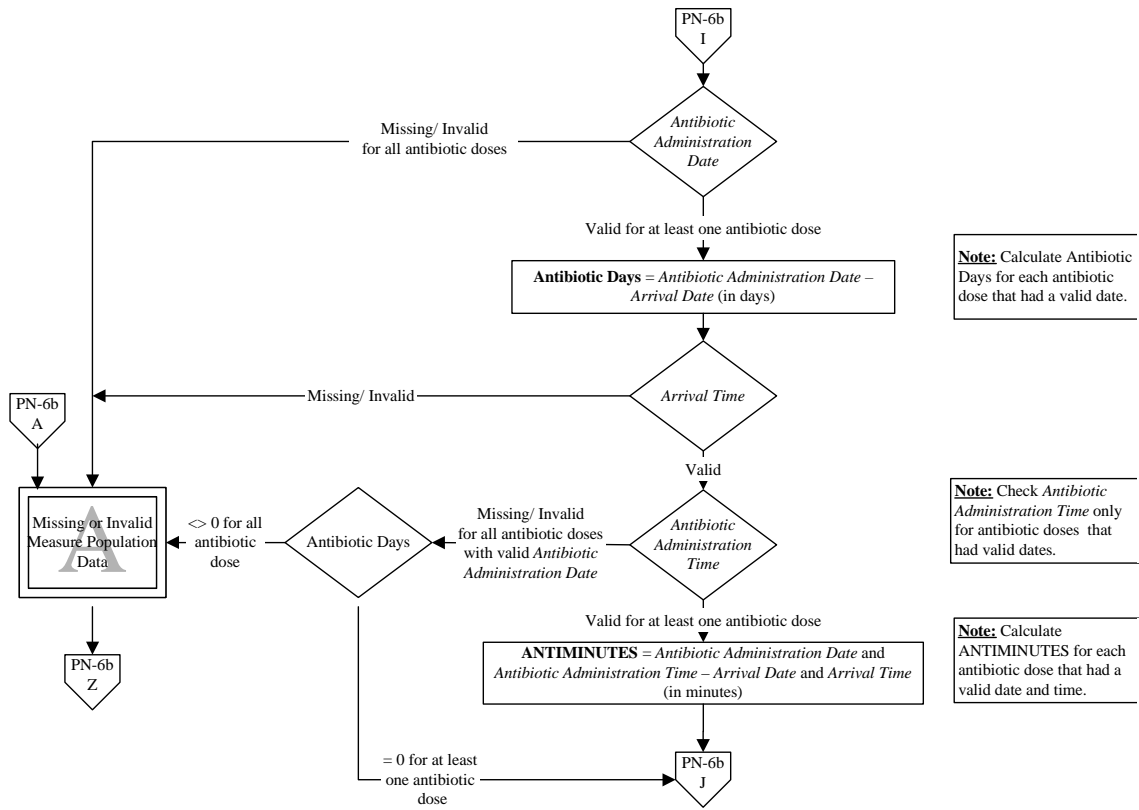
## PN-6b: Initial Antibiotic Selection For Community-Acquired Pneumonia (CAP) In Immunocompetent Patients - Non Intensive Care Unit Patients

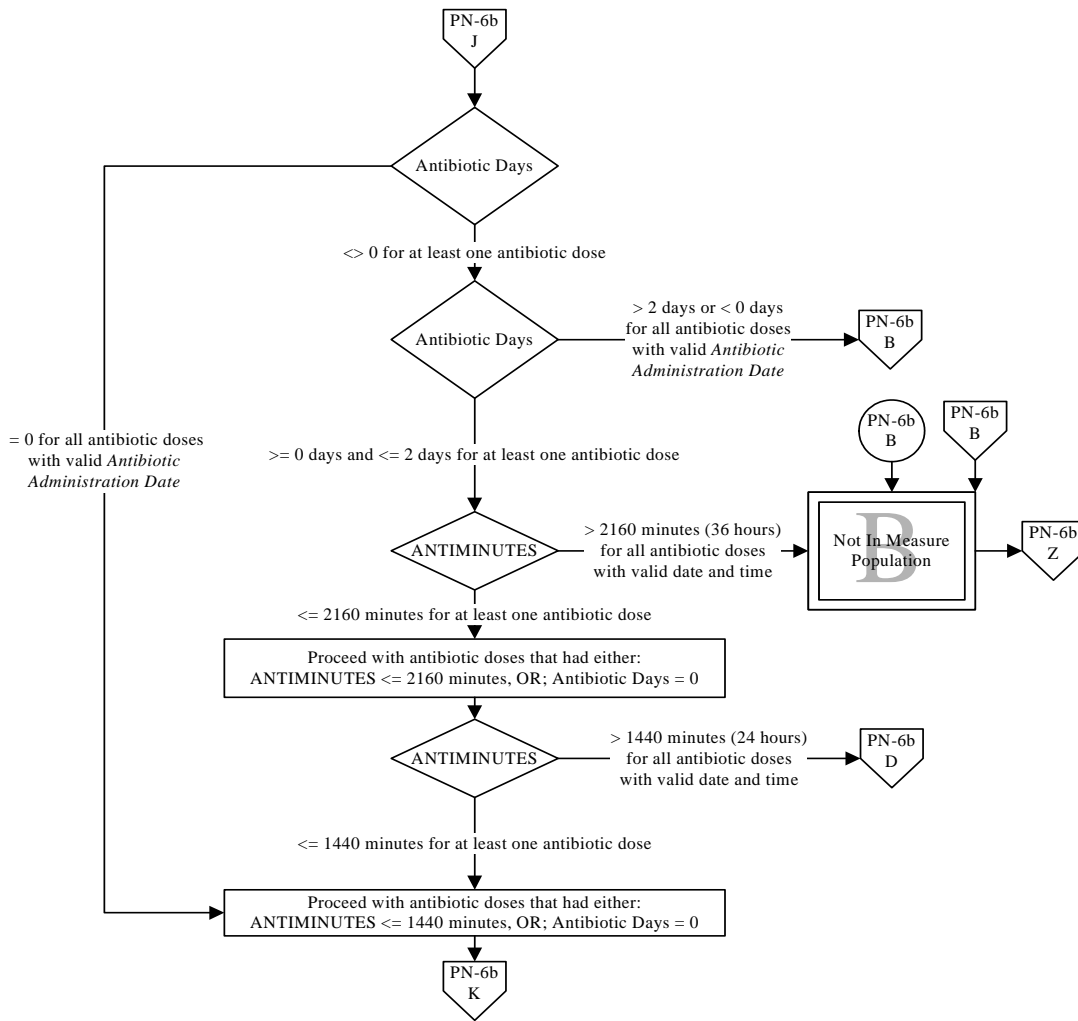
**Numerator:** Non-ICU pneumonia patients who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization

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









**Note:** When checking for route of antibiotic, check ONLY for the corresponding antibiotic dose. For example if an antibiotic on Table 2.9 was received by the patient check if route was appropriate for that antibiotic dose only.

