Pneumonia Event (PNEU)

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Today's Training Goals

- Review the Use of the Available NHSN Lower Respiratory Events
- Review Some PNEU Pearls of Wisdom
- Review Imaging Test Evidence
- Review Secondary BSI Assignment to Pneumonia Event (PNEU)
- Review Updates to PNEU protocol in 2019

Let’s Talk Lower Respiratory Events

- PNEU
- LRI/Lung
- VAE
- PedVAE

In-plan or Off-plan

In-plan surveillance	Facility has indicated in their NHSN Monthly Reporting Plan that the NHSN surveillance protocol(s) will be used, in its entirety, for that particular HAI event type. Only in-plan data are submitted to CMS in accordance with CMS's Quality Reporting Programs and are included in NHSN annual reports or other NHSN publications.

Off-plan surveillance	Facility has **not** indicated in their NHSN Monthly Reporting Plan that the NHSN surveillance protocol(s) will be used, in its entirety, for that particular HAI event type. Off-plan data are not submitted to CMS in accordance with CMS's Quality Reporting Programs and are not included in NHSN annual reports or other NHSN publications.

Key Terms: https://www.cdc.gov/nhsn/pdfs/pscmanual/16psckeyterms_current.pdf

Let's Talk Lower Respiratory Event

- **PNEU –**
  - Available for **in-plan reporting** for ventilated patients in **pediatric locations only (pedVAP)**
  - **Available for off-plan** reporting **any patient** regardless of location, age or ventilation status (for example a state reporting requirement, facility surveillance plan)
  - **Available for secondary BSI assignment in any patient** regardless of location, age or ventilation status. Also regardless of performance of VAE or PedVAE in the same location
- **LRI/Lung** – Available for any patient regardless of location, age or ventilation status
  - Off-plan reporting
  - **Secondary BSI assignment**

Let’s Talk Lower Respiratory Event

- **VAE**
  - Available only for ventilated patients in Adult locations
  - **Secondary BSI assignment <u>possible</u> if PVAP is met**

- **PedVAE**
  - Available only for ventilated patients in Pediatric or NICU locations
  - **Secondary BSI assignment is <u>not available</u>**

FAQs: Pneumonia (PNEU) Events

Ventilator-associated [VAP] and non-ventilator-associated Pneumonia [PNEU]

On This Page

Lower Respiratory Tract Events

VAE and PNEU and LRI su

New and Persistent or
Persistent

VAP surveillance and weaning

ignment to a PNEU event

Sputum and endotracheal aspirate specimen results

Imaging Test Results

Bronchial Breath Sounds

Also a similar FAQ on the VAE and PedVAE web pages

Reminder in both BSI and PNEU protocol

Appendix B: Secondary BSI Guide (*not applicable to Ventilator-associated Events [VAE]*)

The purpose of using the CDC/NHSN infection criteria is to identify and consistently categorize infections that are healthcare-associated into major s fic infection types. LCBI criteria include the caveat that the organism(s) identified f cannot be related to infection at another site (in other words, it must be a primary BSI). On that there is no other CDC/NHSN defined primary site-specific infection that may ha bloodstream secondarily; otherwise the bloodstream infection may be misclassified as a primary BSI and erroneously associated with the use of a central line, specifically called a CL

BSI Protocol

Figure B2 in this appendix, as well as BSI to a VAE. When conducting BSI definitions found in Chapter 17) are a location. For example, a ventilated pa conducted can have a secondary BSI a location where in-plan PedVAP surve PNEU.

Settings: Surveillance may occur in any inpatient pediatric location where denominator data can be collected, such as critical/inten s (pedICUs), specialty care areas (SCA), step-down units, wards, and long t . In-plan surveillance for ventilator-associated pneumonia (pedVAP teria found in this chapter is restricted to patients of any age in pediatri cludes neonatal locations). In-plan surveillance conducted for mechanically-ventilated patients in adult locations (regardless of age) will use the Ventilator-Associated Event (VAE) protocol (see VAE chapter). The PNEU definitions are still available for those units seeking to conduct off-plan PNEU surveillance for mechanically-ventilated adult, pediatric and neonatal patients and non-ventilated adults, pediatric or neonatal patients. The PNEU definitions are also available for secondary bloodstream infection assignment when performing Central Line-Associated Bloodstream Infection (CLABSI) surveillance in ventilated or non-ventilated patients in any location. A complete listing of inpatient locations and instructions for mapping can be found in the CDC Locations and Descriptions chapter.

PNEU Protocol

Knowledge Check 1

When can I use PNEU definitions?

A. Never— always use VAE for adults and PedVAE for children and neonates

B. When conducting in-plan surveillance on mechanically-ventilated children who are in pediatric locations

C. When opting to conduct off-plan surveillance in ventilated or non-ventilated patients in any patient location.

D. When determining if a BSI is secondary to lower respiratory site

E. B, C and D

Knowledge Check 1

When can I use PNEU definitions?

A. Never— always use VAE for adults and PedVAE for children and neonates

B. When conducting in-plan surveillance on mechanically-ventilated children who are in pediatric locations

C. When opting to conduct off-plan surveillance in ventilated or non-ventilated patients in any patient location.

D. When determining if a BSI is secondary to lower respiratory site

E. B, C and D

Where do I find the PNEU Protocol?

Acute Care, Long-term Acute Care, Inpatient Rehabilitation, Inpatient Psychiatric Facility…..

Surveillance for pedVAP and PNEU Events

Ventilator-associated* and non-ventilator-associated Pneumonia (PNEU)

*** In-Plan Pediatric Locations Only**

NOTE: PNEU/VAP (pedVAP) surveillance is available in-plan for patients of any age in non-NICU pediatric locations. In-plan PedVAE surveillance can be conducted for mechanically-ventilated patients in pediatric and neonatal inpatient locations. For in-plan surveillance conducted for mechanically-ventilated patients in adult locations (regardless of age), use the Ventilator-Associated Event (VAE) Protocol [PDF – 1 MB].

Resources for NHSN Users Already Enrolled

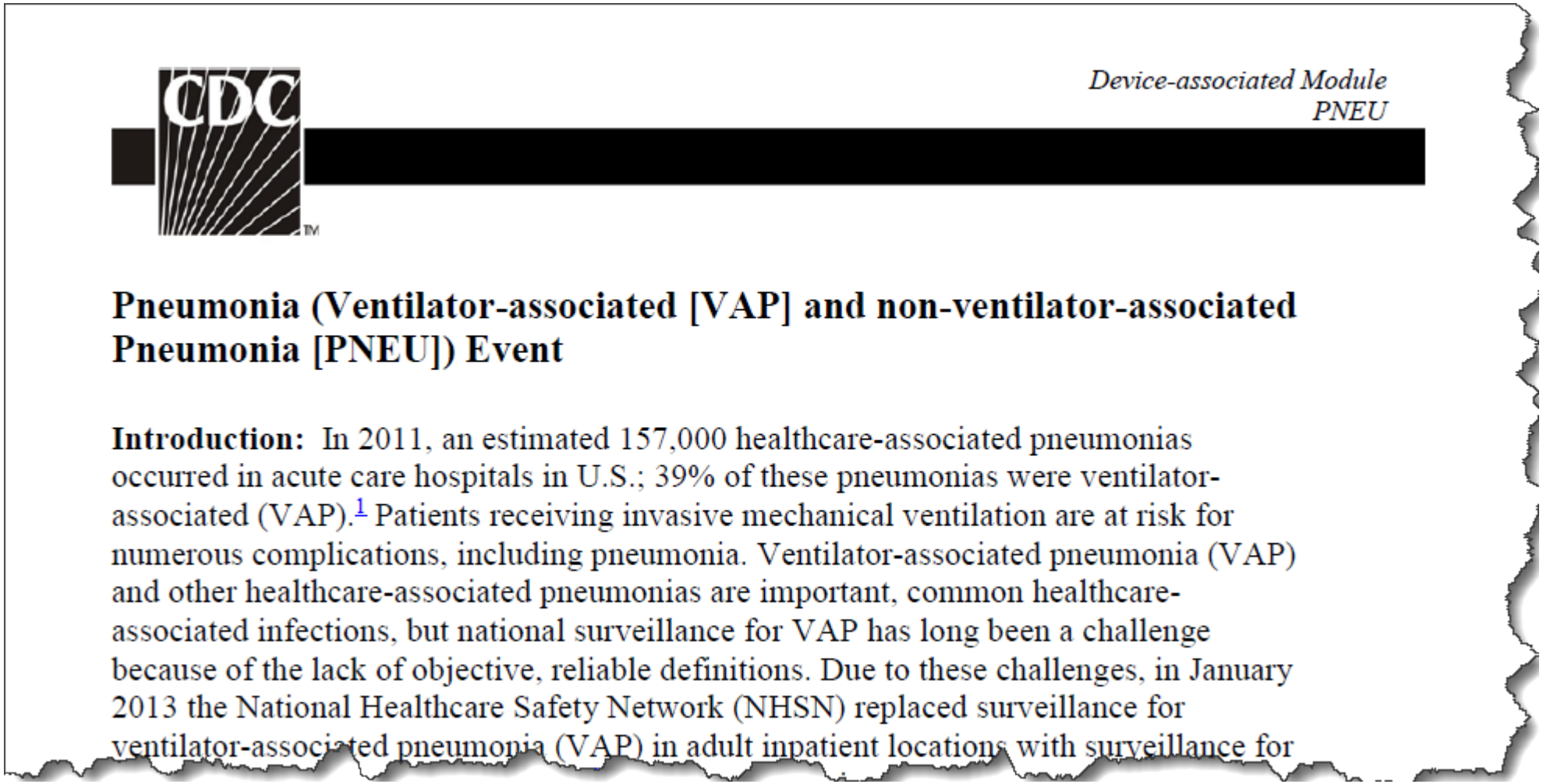
- Training +
- Protocols −
- Frequently Asked Questions
- Data Collection Forms
- Supporting Materials
- Worksheet Generator (electronic) and Worksheets (manual)
- Analysis Resources

Protocols

For full details on protocol definitions and the application of these definitions, please review the applicable protocol and **Chapter 2, Identifying Healthcare-associated Infection (HAI) for NHSN Surveillance** in the NHSN Module.

- Pneumonia (PNEU) Event, January 2019 [PDF – 1 MB]
- NHSN Overview January, 2019 [PDF – 350 KB]
- Identifying Healthcare-associated Infections (HAIs) in NHSN, January 2019 [PDF – 1 MB]
- Patient Safety Monthly Reporting Plan, January 2019 [PDF – 250 KB]

Chapter 6 - NHSN Patient Safety Component Manual



Device-associated Module
PNEU

Pneumonia (Ventilator-associated [VAP] and non-ventilator-associated Pneumonia [PNEU]) Event

Introduction: In 2011, an estimated 157,000 healthcare-associated pneumonias occurred in acute care hospitals in U.S.; 39% of these pneumonias were ventilator-associated (VAP).[1] Patients receiving invasive mechanical ventilation are at risk for numerous complications, including pneumonia. Ventilator-associated pneumonia (VAP) and other healthcare-associated pneumonias are important, common healthcare-associated infections, but national surveillance for VAP has long been a challenge because of the lack of objective, reliable definitions. Due to these challenges, in January 2013 the National Healthcare Safety Network (NHSN) replaced surveillance for ventilator-associated pneumonia (VAP) in adult inpatient locations with surveillance for

PNEU - major type of infection
PNU1, PNU2, PNU3 - specific type infections (algorithms)

PNU1

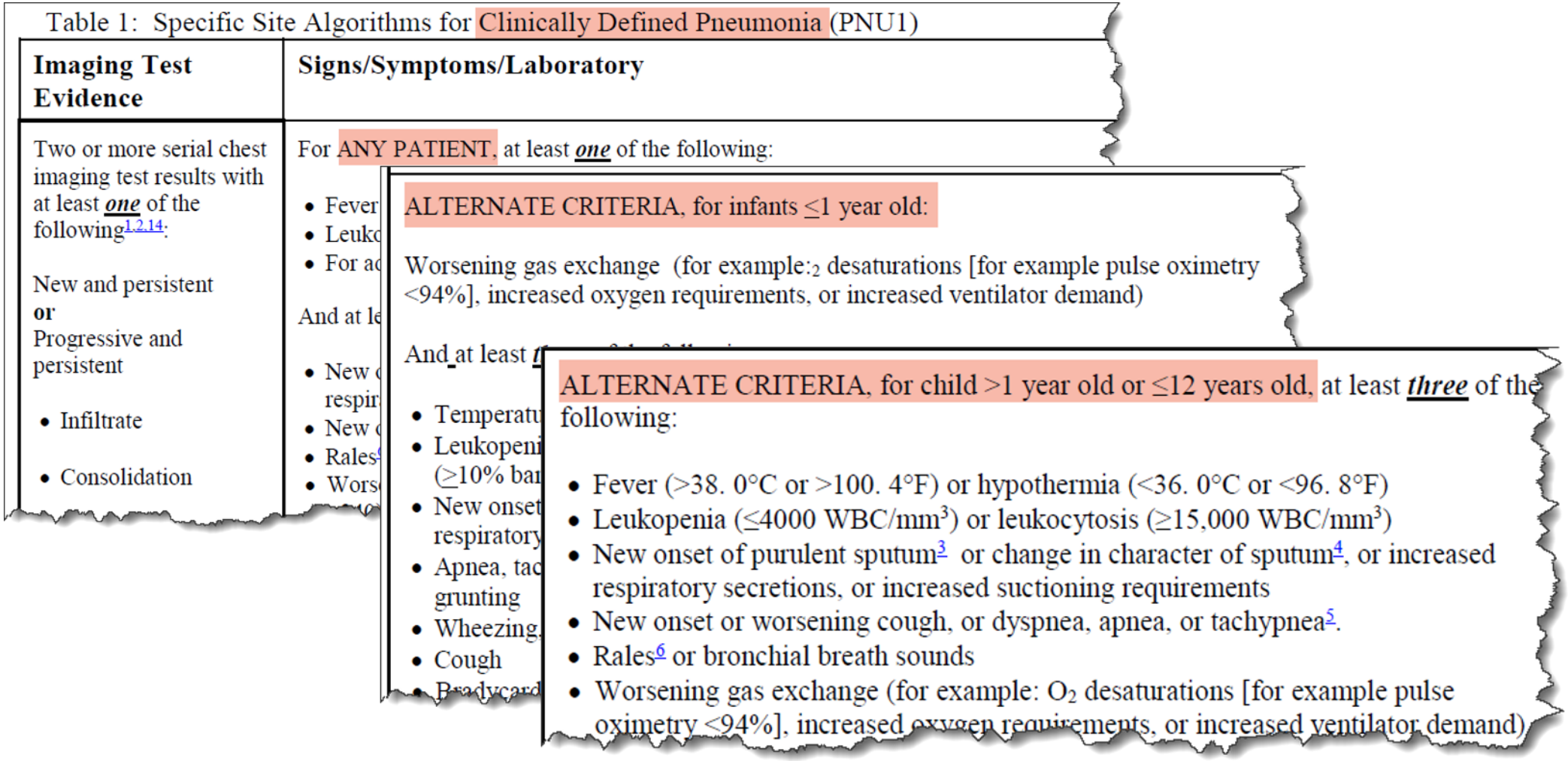


Table 1: Specific Site Algorithms for Clinically Defined Pneumonia (PNU1)

Imaging Test Evidence	Signs/Symptoms/Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and persistent • Infiltrate • Consolidation	For ANY PATIENT, at least ***one*** of the following: • Fever • Leuko • For ac And at le • New respir • New • Rales • Wors ALTERNATE CRITERIA, for infants ≤1 year old: Worsening gas exchange (for example:$_2$ desaturations [for example pulse oximetry <94%], increased oxygen requirements, or increased ventilator demand) And at least • Temperatu • Leukopeni (≥10% ban • New onset respiratory • Apnea, tac grunting • Wheezing, • Cough • Bradycard ALTERNATE CRITERIA, for child >1 year old or ≤12 years old, at least ***three*** of the following: • Fever (>38. 0°C or >100. 4°F) or hypothermia (<36. 0°C or <96. 8°F) • Leukopenia (≤4000 WBC/mm^3) or leukocytosis (≥15,000 WBC/mm^3) • New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements • New onset or worsening cough, or dyspnea, apnea, or tachypnea[5]. • Rales[6] or bronchial breath sounds • Worsening gas exchange (for example: O_2 desaturations [for example pulse oximetry <94%], increased oxygen requirements, or increased ventilator demand)

PNEU - major type of infection
PNU1, PNU2, PNU3 - specific type infections (algorithms)

PNU2

Table 2: Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and persistent • Infiltrate		

Table 3: Specific Site Algorithms for Viral, Legionella, and other Bacterial Pneumonias with Definitive Laboratory Findings (PNU2)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and persistent • Infiltrate • Consolidation • Cavitation	At least ***one*** of the following: • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause And at least ***one*** of the following:	At least ***one*** of the following: • Virus, *Bordetella, Legionella, Chlamydia or Mycoplasma* identified from respiratory secretions or tissue by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example: not Active Surveillance Culture/Testing (ASC/AST). • Fourfold rise in paired sera (IgG) for pathogen (for example: influenza

PNEU - major type of infection
PNU1, PNU2, PNU3 - specific type infections (algorithms)

PNU3

Table 4: Specific Site Algorithm for Pneumonia in Immunocompromised Patients (PNU3)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and persistent • Infiltrate	Patient who is immunocompromised (see definition in footnote [10]) has at least ***one*** of the following: • Fever (>38.0°C or >100.4°F • For adults ≥70 years old, altered mental status with no other recognized cause • New onset of purulent sputum[3]	At least ***one*** of the following: • Identification of matching *Candida* spp. from blood and one of the following: sputum, endotracheal aspirate, BAL or protected specimen brushing.[11,12,13] • Evidence of fungi from minimally-contaminated LRT specimen (specifically BAL, protected specimen brushing or endotracheal aspirate) from one of the following:

Meeting PNEU (PNU1, PNU2, PNU3)

- Must meet the imaging requirement (PNU1, 2, 3)
- Must meet the sign/symptom requirement specific to the criterion (PNU1, 2, 3)
- Must meet the footnote requirements (PNU 1, 2, 3)
- Must meet the laboratory requirement (PNU2, PNU3)

Pearls of Wisdom

Pearls of Wisdom to Remember
(also found in the protocol)

#1

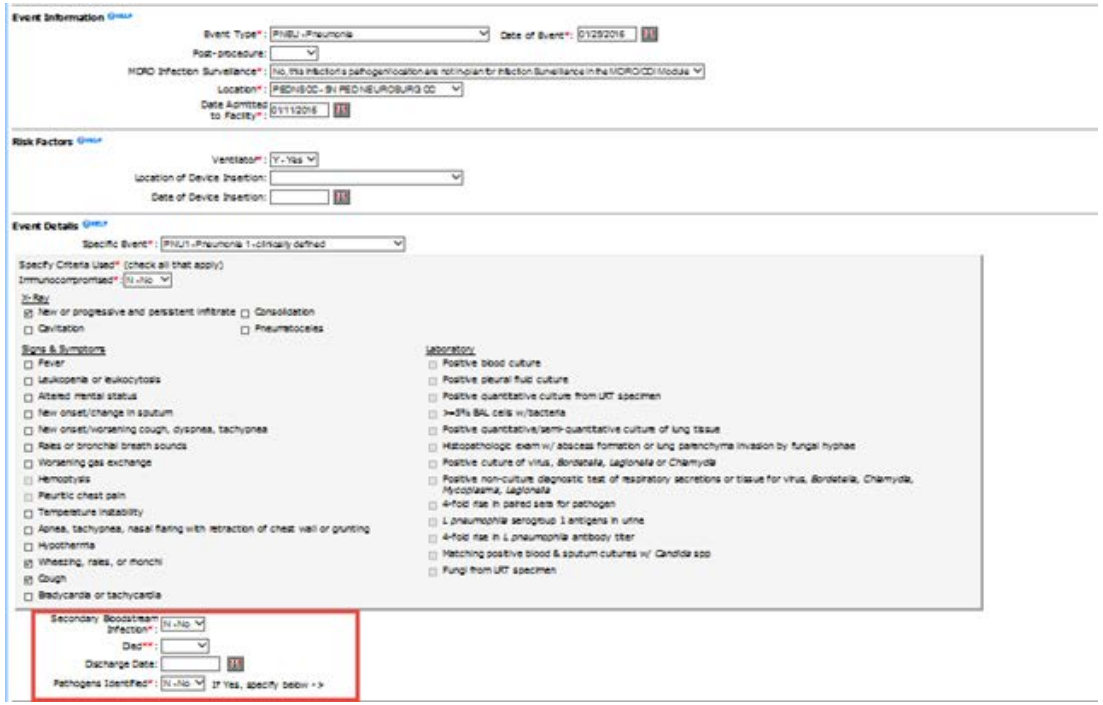
- Although specific criteria are included for infants and children under the PNU1 algorithm and PNU3 algorithm is specific to immunocompromised patients, all patients may meet any of the other pneumonia criteria
  - For example an infant can meet PNU1 any patient, PNU2 or PNU3
  - An immunocompromised patient can met PNU1 or PNU2
- There is a hierarchy for reporting if a patient meets more than one algorithm during the infection window period or the RIT:
  - If a patient meets criteria for both PNU1 and PNU2, report PNU2
  - If a patient meets criteria for both PNU2 and PNU3, report PNU3
  - If a patient meets criteria for both PNU1 and PNU3, report PNU3
- • Pathogens and secondary bloodstream infections can only be reported for PNU2 and PNU3 specific events.

Pearls of Wisdom to Remember

(also found in the protocol)

#2

- Pathogens and secondary bloodstream infections can only be reported for PNU2 and PNU3 specific events
- A BSI cannot be secondary to PNU1
- PNU1 does not have a site specific specimen or a blood culture as a part of the criterion



Pearls of Wisdom to Remember
Don't Forget the Footnotes!

#3

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent or Progressive and persistent • Infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old **Note**: In patients ***without*** underlying pulmonary or cardiac disease (for example: respiratory distress syndrome, bronchopulmonary dysplasia, pulmonary edema, or chronic obstructive pulmonary disease), <u>one definitive</u> chest imaging test result is ac...	At least ***<u>one</u>*** of the following: • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm^3) <u>or</u> leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause And at least ***<u>one</u>*** of the following: • New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements • New onset or worsening cough, or dyspnea or tachypnea[5] • Rales[6] or bronchial breath sounds • Worsening gas exchange (for example: O_2 desaturations [for example: PaO_2/FiO_2 ≤240][7], increased oxygen requirements, or increased ventilator demand)	At least ***<u>one</u>*** of the following: • Organism identified from blood[8,13] • Organism identified from pleural fluid[9,13] • Positive quantitative culture or corresponding semi-quantitative culture result[9] from minimally-contaminated LRT specimen (specifically, BAL, protected specimen brushing or endotracheal aspirate) • ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (for example: Gram's stain) • Positive quantitative culture or corresponding semi-quantitative culture result[9] of lung tissue • Histopathologic exam shows at least ***<u>one</u>*** of the following evidences of pneumonia: ○ Abscess formation or foci of consolidation with intense PMN accumulation in bronchioles and al...

Footnotes to Algorithms and Flow Diagrams:

1. To help confirm difficult cases ,multiple imaging test results spanning over several calendar days must be considered when determining if there is imaging test evidence of pneumonia.. Pneumonia may have rapid onset and progression, but does not resolve quickly. Imaging test evidence of pneumonia will persist. Rapid imaging resolution suggests that the patient does not have pneumonia, but rather a non-infectious process such as atelectasis or congestive heart failure.
   - In non-ventilated patients, the diagnosis of healthcare-associated pneumonia may be quite clear on the basis of signs, symptoms and a single definitive chest imaging test result. Therefore, in a patient without underlying pulmonary or cardiac disease and when there is only one imaging test available, if it is an eligible finding, the imaging test evidence requirement can be met.
   - In patients without underlying disease if more than one imaging test is available serial imaging test results must also be evaluated and demonstrate persistence.
   - In patients with underlying disease, serial chest imaging test results must be examined to help separate infectious from non-infectious pulmonary processes. In patients with pulmonary or cardiac disease (for example: interstitial lung disease or congestive heart failure), the diagnosis of pneumonia may be particularly difficult. For example: Pulmonary edema from decompensated congestive heart failure may simulate the presentation of pneumonia.

2. Note that there are many ways of describing the imaging appearance of pneumonia. Examples include, but are not limited to, "air-space disease", "focal opacification", "patchy areas of increased density". Although perhaps not specifically delineated as pneumonia by the radiologist, in the appropriate clinical setting these alternative descriptive wordings should be seriously considered as potentially positive findings. If provided and the findings are not documented as attributed to another issue (for example pulmonary edema, chronic lung disease) they are eligible for meeting imaging test evidence of pneumonia.

3. Purulent sputum is defined as secretions from the lungs, bronchi, or trachea that contain ≥25 neutrophils and ≤10 squamous epithelial cells per low power field (x100). Refer to the table below if ... laboratory reports th... data semi-quantitati... or uses ... different format for reporting Gram

Knowledge Check 2

There is definitive imaging test evidence suggestive of pneumonia, the patient has a fever of 38.9° C, there is documentation of new onset cough and rales and *Pseudomonas aeruginosa* has been identified in a expectorated sputum specimen. All of the above have a date associated with them such that they are in a 7 day IWP. **What is identified?**

A. PNU1
B. PNU2
C. Nothing
D. I don't know

Knowledge Check 2 - Rationale

There is definitive imaging test evidence suggestive of pneumonia, the patient has a fever of 38.9° C, there is documentation of new onset cough and rales and *Pseudomonas aeruginosa* has been identified in [illegible] expectorated sputum specimen. All of the [illegible] have a date associated with them such that [illegible]e in a 7 day IWP. **What is identified?**

Sputum is not a minimally contaminated specimen

A. PNU1
B. PNU2
C. Nothing
D. I don't know

Footnote # 9……

Table 2: Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent or Progressive and persistent • Infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants <1 year old	At least ***one*** of the following: • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause And at least ***one*** of the following: • New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions,	At least ***one*** of the following: • Organism identified from blood[8,13] • Organism identified from pleural fluid[9,13] • Positive quantitative culture or corresponding semi-quantitative culture result[9] from minimally-contaminated LRT specimen (specifically, BAL, protected specimen brushing or endotracheal aspirate) • ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (for example:

9. Refer to threshold values for cultured specimens with growth of eligible pathogens. (Table 5).

Notes:

- A specimen that is not obtained through an artificial airway (specifically endotracheal tube or tracheostomy) from a ventilated patient is not considered minimally contaminated and is not eligible for use in meeting the laboratory criteria for PNU2. Sputum or tracheal secretions collected from a non-ventilated patient are not minimally-contaminated specimens.
- Because they are an indication of commensal flora of the oral cavity or upper respiratory tract, the following organisms can only be used to meet PNEU definitions when identified from pleural fluid obtained during thoracentesis or initial placement of chest tube (not from an indwelling chest tube) or lung tissue:
  - Coagulase-negative *Staphylococcus* species
  - *Enterococcus* species
  - *Candida* species or yeast not otherwise specified. Exception: identification of matching *Candida* spp. from blood and sputum, endotracheal aspirate, BAL or protected specimen brushing can be used to satisfy PNU3 definition for immunocompromised patients.

Knowledge Check 3

What if the specimen was minimally contaminated would PNU2 be met?

There is definitive imaging test evidence suggestive of pneumonia, the patient has a fever of 38.9° C, there is documentation of new onset cough and rales. *Pseudomonas aeruginosa* has been identified in a BAL specimen. All of the above have a date associated with them such that they are in a 7 day IWP. **Is PNU2 met?**

A. Yes
B. No
C. Maybe
D. I don't know

Knowledge Check 3

What if the specimen <u>was</u> minimally contaminated would PNU2 be met?

There is definitive imaging test evidence suggestive of pneumonia, the patient has a fever of 38.9° C, there is documentation of new onset cough and rales. *Pseudomonas aeruginosa* has been identified in a BAL specimen. All of the above have a date associated with them such that they are in a 7 day IWP. **Is PNU2 met?**

A. Yes
B. No
✔ C. Maybe
D. I don't know

The quantity of the pathogen must meet the requirement found in Table 5

Footnote # 9……

Table 2: Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent or Progressive and persistent • Infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants <1 year old	At least ***one*** of the following: • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause And at least ***one*** of the following: • New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions,	At least ***one*** of the following: • Organism identified from blood[8,13] • Organism identified from pleural fluid[9,13] • Positive quantitative culture or corresponding semi-quantitative culture result[9] from minimally-contaminated LRT specimen (specifically, BAL, protected specimen brushing or endotracheal aspirate) • ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (for example:

9. Refer to threshold values for cultured specimens with growth of eligible pathogens. (Table 5).

Notes:

- A specimen that is not obtained through an artificial airway (specifically endotracheal tube or tracheostomy) from a ventilated patient is not considered minimally contaminated and is not eligible for use in meeting the laboratory criteria for PNU2. Sputum or tracheal secretions collected from a non-ventilated patient are not minimally-contaminated specimens.
- Because they are an indication of commensal flora of the oral cavity or upper respiratory tract, the following organisms can only be used to meet PNEU definitions when identified from pleural fluid obtained during thoracentesis or initial placement of chest tube (not from an indwelling chest tube) or lung tissue:
  - Coagulase-negative *Staphylococcus* species
  - *Enterococcus* species
  - *Candida* species or yeast not otherwise specified. Exception: identification of matching *Candida* spp. from blood and sputum, endotracheal aspirate, BAL or protected specimen brushing can be used to satisfy PNU3 definition for immunocompromised patients.

Table 5 – Threshold values for cultured specimens

- If the quantity of Pseudomonas was sufficient it is possible PNU2 could be met

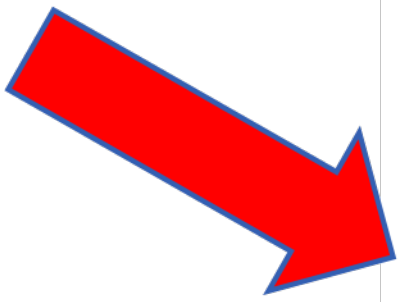


Table 5: Threshold values for cultured specimens used in the diagnosis of pneumonia

Specimen collection/technique	Values*
Lung tissue†	≥10^4 CFU/g tissue
Bronchoscopically (B) obtained specimens	
Bronchoalveolar lavage (B-BAL)	≥10^4 CFU/ml
Protected BAL (B-PBAL)	≥10^4 CFU/ml
Protected specimen brushing (B-PSB)	≥10^3 CFU/ml
Nonbronchoscopically (NB) obtained (blind)specimens	
NB-BAL	≥10^4 CFU/ml
NB-PSB	≥10^3 CFU/ml
Endotracheal aspirate (ETA)	≥ 10^5 CFU/ml

CFU = colony forming units
g = gram
ml = milliliter

* Consult with your laboratory to determine if reported semi-quantitative results match the quantitative thresholds. In the absence of additional information available from your laboratory, a semi-quantitative result of "moderate" or "heavy" growth, or 2+, 3+ or 4+ growth is considered to correspond.
†Open-lung biopsy specimens and immediate post-mortem specimens obtained by transthoracic or transbronchial biopsy

Imaging Test Evidence

Imaging Test Evidence of Pneumonia

- Can be challenging to determine if an imaging test results meet the requirement
- Findings must be new **and** persistent OR progressive **and** persistent
- Simply finding the words: infiltrate, consolidation, opacity or air space disease on an imaging test report is not enough
- Unlike imaging for other NHSN events, due to the persistence requirement, all available imaging findings that are temporally related must be considered
- Only definitive and equivocal findings are eligible for consideration
- For purposes of PNEU surveillance, atelectasis is not evidence of pneumonia

Imaging Test Evidence of Pneumonia

Evidence suggestive of pneumonia

- new or worsening finding of infiltrate, consolidation, cavitation, pneumatoceles (infants ≤1 y/o) or other descriptive wording that could be considered (for example, opacity, air space disease, density) that is **not attributed** to something other than pneumonia

And

Evidence of persistence

- no indication of rapid resolution
- no subsequent indication the finding is attributable to another condition (for example, 2 days later the opacity is now attributed to pulmonary edema)

What if findings are equivocal?

- Infiltrate vs. atelectasis ????
- Opacity may represent pneumonia or congestive heart failure ???
- Look for further imaging test evidence that clarifies the equivocal finding
    - Verifies the finding is suggestive of pneumonia and that there is persistence making the equivocal finding eligible for use

    or

    - Verifies the finding is not suggestive of pneumonia making the equivocal finding NOT eligible for use

What if equivocal findings continue to be equivocal- there is no verification on imaging either way?

- In the absence of verification one way or the other **THEN and only then** can clinical correlation be used.
  - Physician documentation of antimicrobial treatment for site-specific infection ---- in this case treatment for pneumonia

- Otherwise physician diagnosis of pneumonia or treatment for pneumonia is not used to meet PNEU

Knowledge Check # 4

The imaging requirement for PNEU is met with the following imaging test findings:

- 2/16: Airspace opacity overlying the heart, more likely to be atelectasis than pneumonia/aspiration
- 2/17: Persistent dense left lower lobe atelectasis and/or infiltrate and small effusion
- 2/18: Improving left lung base opacity and left effusion
- 2/19: Left lower lobe opacities improved. No infiltrates

There are no more chest imaging tests after the 19th

A. True

B. False

Knowledge Check # 4 - Rationale

Is the imaging requirement for PNEU met with the following imaging test findings?

- 2/16: Airspace **opacity** overlying the heart, more likely to be atelectasis than **pneumonia**/aspiration equivocal atelectasis vs. pneumonia
- 2/17: Persistent dense left lower lobe atelectasis and/or **infiltrate** and small effusion - equivocal atelectasis vs. pneumonia
- 2/18: Improving left lung base **opacity** and left effusion – improving opacity
- 2/19: Left lower lobe **opacities** improved. No infiltrates equivocal finding of atelectasis vs. infiltrate is now confirmed to NOT be infiltrate

There are no more chest imaging tests after the 19th

A. True

✓ B. False

Footnote # 1, 2, 14 ……

Imaging Test Evidence

Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]:

New and persistent
or
Progressive and persistent

- Infiltrate
- Consolidation
- Cavitation
- Pneumatoceles, in infants ≤1 year old

Footnotes to Algorithms and Flow Diagrams:

1. To help confirm difficult cases ,multiple imaging test results spanning over several calendar days must be considered when determining if there is imaging test evidence of pneumonia.. Pneumonia may have rapid onset and progression, but does not resolve quickly. Imaging test evidence of pneumonia will persist. Rapid imaging resolution suggests that the patient does not have pneumonia, but rather a non-infectious process such as atelectasis or congestive heart failure.
   - In non-ventilated patients, the diagnosis of healthcare-associated pneumonia may be quite clear on the basis of signs, symptoms and a single definitive chest imaging test result. Therefore, in a patient without underlying pulmonary or cardiac disease and when there is only one imaging test available, if it is an eligible finding, the imaging test evidence requirement can be met.
   - In patients without underlying disease if more than one imaging test is available serial imaging test results must also be evaluated and demonstrate persistence.
   - In patients with underlying disease, serial chest imaging test results must be examined to help separate infectious from non-infectious pulmonary processes. In patients with pulmonary or cardiac disease (for example: interstitial lung disease or congestive heart failure), the diagnosis of pneumonia may be particularly difficult. For example: Pulmonary edema from decompensated congestive heart failure may simulate the presentation of pneumonia.

2. Note that there are many ways of describing the imaging appearance of pneumonia. Examples include, but are not limited to, "air-space disease", "focal opacification", "patchy areas of increased density". Although perhaps not specifically delineated as pneumonia by the radiologist, in the appropriate clinical setting these alternative descriptive wordings should be seriously considered as potentially positive findings. If provided and the findings are not documented as attributed to another issue (for example pulmonary edema, chronic lung disease) they are eligible for meeting imaging test evidence of pneumonia.

14. If the imaging test result is equivocal for pneumonia, check to see if subsequent imaging tests are definitive. For example, if a chest imaging test result states infiltrate vs. atelectasis and a subsequent imaging test result is definitive for infiltrate—the initial imaging test would be eligible for use. In the absence of finding a subsequent imaging result that clarifies the equivocal finding, if there is clinical correlation then the equivocal imaging test is eligible for use.

Pathogen Exclusions

Pathogen Exclusions when meeting PNEU

All *Candida* species or yeast not otherwise specified

All coagulase negative *Staphylococcus* species

All *Enterococcus* species

- *Excluded as a site specific pathogen and also as a blood pathogen* **unless** isolated from lung tissue or pleural fluid
- **Exception**: Candida species is eligible for use when meeting PNU3

IF

- Patient meets the immunocompromised definition
- Matching *Candida* is identified from a respiratory specimen and blood specimen and both have a collection date in the IWP

PNU3 and Candida……..Footnotes # 10, 11……

Table 4: Specific Site Algorithm for Pneumonia in Immunocompromised Patients (PNU3)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and	Patient who is immunocompromised (see definition in footnote [10]) has at least ***one*** of the following: • Fever (>38.0°C or >100.4°F • For adults >70 years old, altered	At least ***one*** of the following: • Identification of matching *Candida* spp. from blood and one of the following: sputum, endotracheal aspirate, BAL or protected specimen brushing.[11,12,13] • Evidence of fungi from minimally

10. Immunocompromised patients include only

- those with neutropenia defined as absolute neutrophil count or total white blood cell count (WBC) <500/mm^3
- those with leukemia, lymphoma or who are HIV positive with CD4 count <200
- those who have undergone splenectomy
- those who have a history of solid organ or hematopoietic stem cell transplant
- those on cytotoxic chemotherapy
- those on steroids (excluding inhaled steroids) daily for >2 weeks on the date of event

11. Blood specimen and sputum, endotracheal aspirate, BAL or protected specimen brushing specimens must have a collection date that occurs within the Infection Window Period.

Pneumonia and Secondary BSI Assignment

PNEU and Secondary BSI Assignment*

An PNEU site-specific definition must be met

AND

One of the following scenarios must be met:

Scenario 1:

At least one organism from the blood specimen matches an organism identified from the site-specific infection that is used as an element to meet the **PNEU** criterion AND the blood specimen is collected during the secondary BSI attribution period (infection window period + repeat infection timeframe)

OR

Scenario 2:

An organism identified in the blood specimen is an element that is used to meet **PNEU** criterion, and therefore is collected during the site-specific infection window period.

*BSI Protocol https://www.cdc.gov/nhsn/pdfs/pscmanual/4psc_clabscurrent.pdf Appendix B: Secondary BSI Guide

BSI Secondary to PNEU Scenario 1

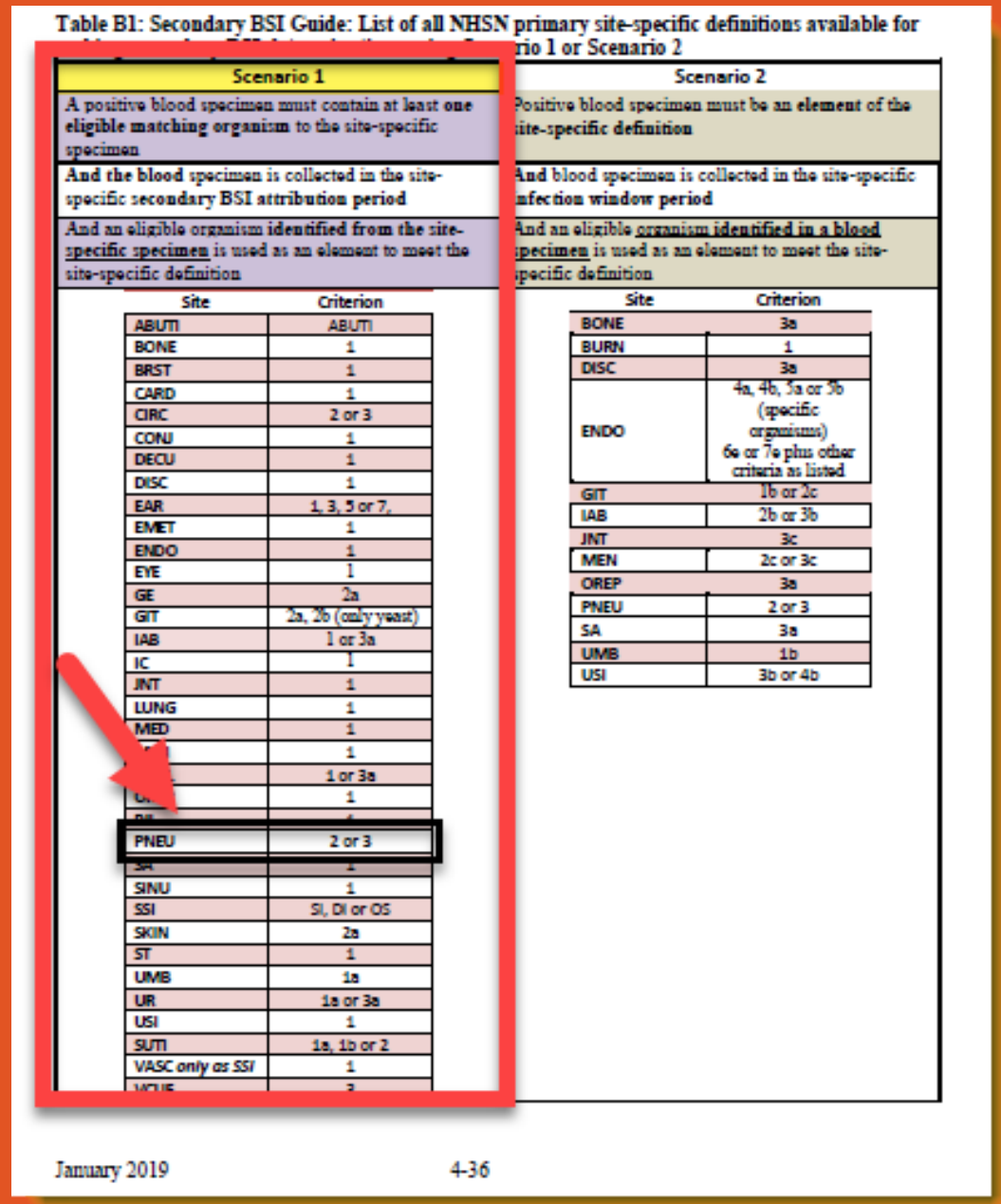


Table B1: Secondary BSI Guide: List of all NHSN primary site-specific definitions available for rio 1 or Scenario 2

Scenario 1	
A positive blood specimen must contain at least **one eligible matching organism** to the site-specific specimen	
And the blood specimen is collected in the site-specific **secondary BSI attribution period**	
And an eligible organism **identified from the site-specific specimen** is used as an element to meet the site-specific definition	
Site	**Criterion**
ABUTI	ABUTI
BONE	1
BRST	1
CARD	1
CIRC	2 or 3
CONJ	1
DECU	1
DISC	1
EAR	1, 3, 5 or 7,
EMET	1
ENDO	1
EYE	1
GE	2a
GIT	2a, 2b (only yeast)
IAB	1 or 3a
IC	1
JNT	1
LUNG	1
MED	1
[illegible]	1
[illegible]	1 or 3a
[illegible]	1
[illegible]	[illegible]
PNEU	2 or 3
[illegible]	1
SINU	1
SSI	SI, DI or OS
SKIN	2a
ST	1
UMB	1a
UR	1a or 3a
USI	1
SUTI	1a, 1b or 2
VASC *only as SSI*	1
[illegible]	[illegible]

Scenario 2	
Positive blood specimen must be an **element** of the site-specific definition	
And blood specimen is collected in the site-specific **infection window period**	
And an eligible organism **identified in a blood specimen** is used as an element to meet the site-specific definition	
Site	**Criterion**
BONE	3a
BURN	1
DISC	3a
ENDO	4a, 4b, 5a or 5b (specific organisms) 6a or 7a plus other criteria as listed
GIT	1b or 2c
IAB	2b or 3b
JNT	3c
MEN	2c or 3c
OREP	3a
PNEU	2 or 3
SA	3a
UMB	1b
USI	3b or 4b

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BSI Secondary to PNEU – Scenario 1

Scenario 1:

At least one organism from the blood specimen matches an organism identified from the site-specific infection that is used as an element to meet the PNEU criterion AND the blood specimen is collected during the secondary BSI attribution period

- PNEU Eligible specimens include:
  - Minimally contaminated specimen (Endotracheal aspirate, BAL, protected specimen brushing)
  - Pleural fluid
  - Lung tissue

  Sputum is **NOT a minimally contaminated specimen**
- Eligible site specific specimen collection date occurs within the 7-day infection window period
- Blood culture collection date occurs in the secondary BSI attribution period (SBAP)

BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least one organism.

Examples of site specific specimens

Table 2: Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and persistent • Infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old **Note**: In patients ***without*** underlying pulmonary or cardiac disease (for	At least ***one*** of the following: • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3) • For adults ≥70 years old, altered mental status with no other recognized cause And at least ***one*** of the following: • New onset of purulent sputum[3] or change in character of sputum[4], or increased respiratory secretions, or increased suctioning requirements • New onset or worsening cough, or dyspnea or tachypnea[5]	At least ***one*** of the following: • Organism identified from blood[8,13] • Organism identified from pleural fluid[9,13] • Positive quantitative culture or corresponding semi-quantitative culture result[9] from minimally-contaminated LRT specimen (specifically, BAL, protected specimen brushing or endotracheal aspirate) • ≥5% BAL-obtained cells contain intracellular bacteria on direct microscopic exam (for example: Gram's stain) • Positive quantitative culture or corresponding semi-quantitative culture result[9] of lung tissue • Histopathologic exam shows at least ***one***

BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least one organism.

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	BAL: Many *A. baumannii*
12		6	
13		7	
14		8	
15		9	
16	BC +	10	Blood Culture : *A baumannii*
17		11	
18		12	
19		13	
20		14	
21			

- **PNU2 is met site specific specimen**
- **Blood Culture collection date within the SBAP**
- **Matches at least one**

PNU2 & Secondary BSI

Date of Event = Day 7

Pathogen*: A.baumannii*

BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least one organism.

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	BAL: 4+ *A. baumannii* , 3+ *S. aureus*
12		6	
13		7	
14		8	
15		9	
16	BC +	10	Blood Culture : *S. aureus*
17		11	
18		12	
19		13	
20		14	
21			

- PNU2 is met site specific specimen
- Blood Culture collection date within the SBAP
- Matches at least one

PNU2 & Secondary BSI

Date of Event = Day 7

Pathogen: *A.baumannii, S. aureus*

BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least one organism

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	BAL: Many *A. baumannii*
12		6	
13		7	
14		8	
15		9	
16	BC +	10	Blood C[illegible]e : S. aureus
17		11	
18		12	
19		13	
20		14	
21			

- **PNU2 is met site specific specimen**
- **Blood Culture collection date within the SBAP**
- **BUT---No match**
- **No secondary BSI**

PNU2

Date of Event = Day 7

Pathogen*: A.baumannii*

PNEU and Secondary BSI Assignment– Scenario 1 Excluded Pathogens

Candida species or yeast not otherwise specified

Coagulase negative _Staphylococcus_ species

Enterococcus species

- Excluded as a secondary BSI pathogen unless isolated from lung tissue or pleural fluid which is used to meet PNU2 or PNU3 and the blood specimen has a collection date in the PNEU secondary BSI attribution period. (Scenario 1)

BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least one organism

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	BAL: Many *A. baumannii*
12		6	
13		7	
14		8	
15		9	
16	BC +	10	Blood Culture : *A baumannii* & *VRE*
17		11	
18		12	
19		13	
20		14	
21			

- PNU2 –site specific specimen
- Blood Culture collection date within the SBAP
- Matches at least one
- BUT---VRE is excluded pathogen
- Determine if VRE BSI is secondary to another site specific infection or primary BSI/CLABSI

PNU2 & Secondary BSI

Date of Event = Day 7

Pathogen: *A.baumannii*

BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least one organism

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	Lung : VRE
12		6	
13		7	
14		8	
15		9	
16	BC +	10	Blood Culture : *VRE*
17		11	
18		12	
19		13	
20		14	
21			

- PNU2 is met –site specific specimen
- Blood Culture collection date within the SBAP
- VRE is not excluded when identified in Lung tissue (or pleural fluid)
- VRE BSI can be secondary to PNU2

PNU2 & Secondary BSI

Date of Event = Day 7

Pathogen*: VRE*

BSI Secondary to PNEU Scenario 2

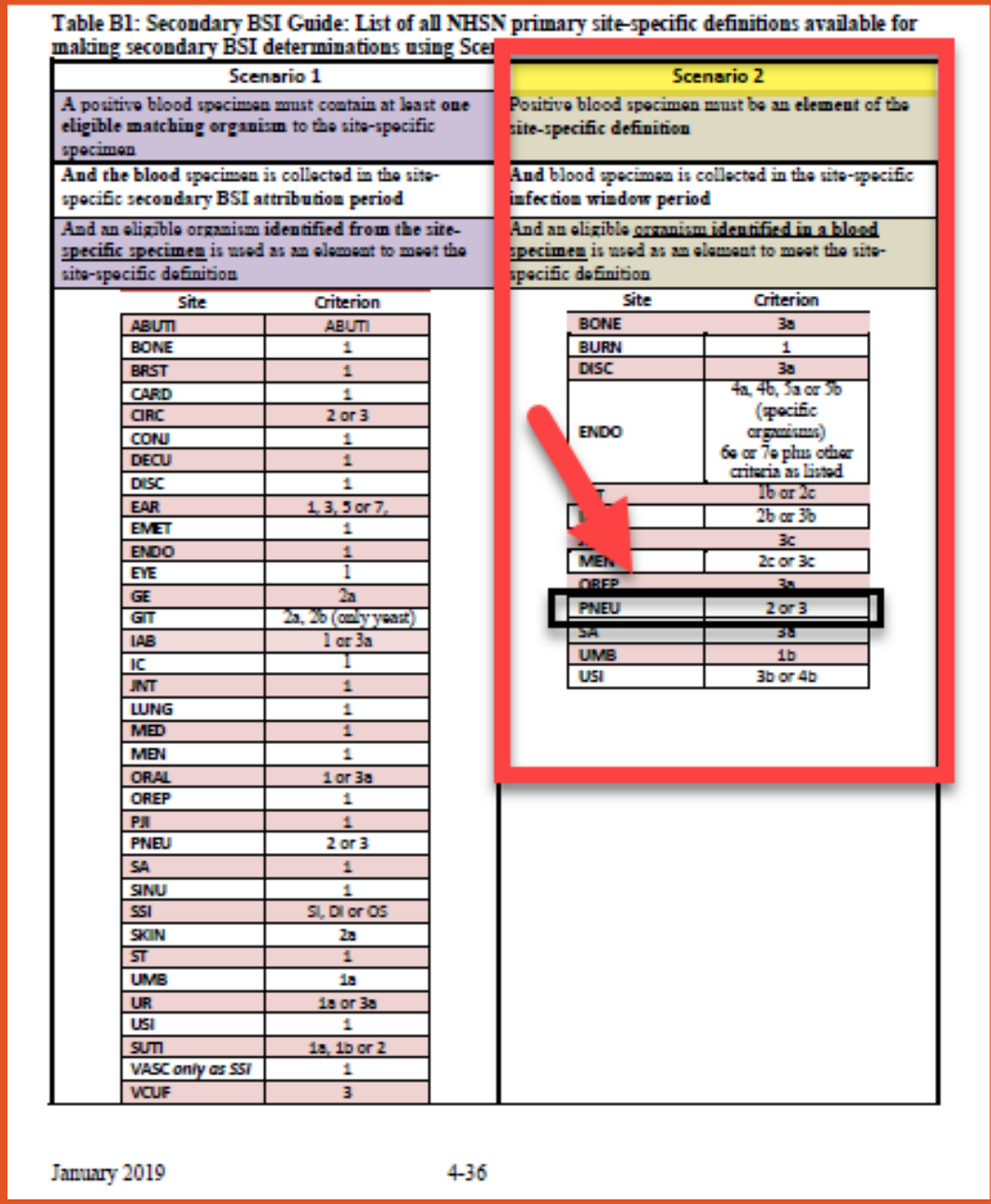

Table B1: Secondary BSI Guide: List of all NHSN primary site-specific definitions available for making secondary BSI determinations using Scen

Scenario 1	Scenario 2
A positive blood specimen must contain at least **one eligible matching organism** to the site-specific specimen	Positive blood specimen must be an **element** of the site-specific definition
And the blood specimen is collected in the site-specific secondary BSI attribution period	**And** blood specimen is collected in the site-specific **infection window period**
And an eligible organism **identified from the site-specific specimen** is used as an element to meet the site-specific definition	And an eligible organism **identified in a blood specimen** is used as an element to meet the site-specific definition

Site	Criterion	Site	Criterion
ABUTI	ABUTI	BONE	3a
BONE	1	BURN	1
BRST	1	DISC	3a
CARD	1	ENDO	4a, 4b, 5a or 5b (specific organisms) 6a or 7a plus other criteria as listed
CIRC	2 or 3		1b or 2c
CONJ	1		2b or 3b
DECU	1		3c
DISC	1	MEN	2c or 3c
EAR	1, 3, 5 or 7,	OREP	3a
EMET	1	PNEU	2 or 3
ENDO	1	SA	3a
EYE	1	UMB	1b
GE	2a	USI	3b or 4b
GIT	2a, 2b (only yeast)		
IAB	1 or 3a		
IC	1		
JNT	1		
LUNG	1		
MED	1		
MEN	1		
ORAL	1 or 3a		
OREP	1		
PJI	1		
PNEU	2 or 3		
SA	1		
SINU	1		
SSI	SI, DI or OS		
SKIN	2a		
ST	1		
UMB	1a		
UR	1a or 3a		
USI	1		
SUTI	1a, 1b or 2		
VASC only as SSI	1		
VCUF	3		

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BSI Secondary to PNEU – Scenario 2

Scenario 2:

An organism identified in the blood specimen is an element that is used to meet PNEU criterion, and therefore is collected during the site-specific infection window period.

- Blood culture collection date occurs within a 7-day infection window period
- Pathogen exclusions apply

BSI Secondary to PNEU – Scenario 2

Examples of Blood as an Element

Table 2: Specific Site Algorithms for Pneumonia with Common Bacterial or Filamentous Fungal Pathogens and Specific Laboratory Findings (PNU2)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent **or** Progressive and persistent • Infiltrate • Consolidation • Cavitation • Pneumatoceles, in infants ≤1 year old **Note**: In patients ***without*** underlying pulmonary or cardiac disease (for	At least ***one*** of the following: • Fever (>38.0°C or >100.4°F) • Leukopenia (≤4000 WBC/mm^3) or leukocytosis (≥12,000 WBC/mm^3)	At least ***one*** of the following: • Organism identified from blood[8,13] • Organism identified from pleural fluid[9,13] • Positive quantitative culture or corresponding semi-quantitative culture

Table 4: Specific Site Algorithm for Pneumonia in Immunocompromised Patients (PNU3)

Imaging Test Evidence	Signs/Symptoms	Laboratory
Two or more serial chest imaging test results with at least ***one*** of the following[1,2,14]: New and persistent or Progressive and persistent • Infiltrate • Consolidation • Cavitation	Patient who is immunocompromised (see definition in footnote [10]) has at least ***one*** of the following: • Fever (>38.0°C or >100.4°F) • For adults ≥70 years old, altered mental status with no other recognized cause • New onset of purulent sputum[3], or change in character of sputum[4], or increased respiratory secretions, or increased	At least ***one*** of the following: • Identification of matching *Candida* spp. from blood and one of the following: sputum, endotracheal aspirate, BAL or protected specimen brushing[11,12,13] • Evidence of fungi from minimally-contaminated LRT specimen (specifically BAL, protected specimen brushing or endotracheal aspirate) from one of the following: – Direct microscopic exam – Positive culture of fungi

BSI Secondary to PNEU – Scenario 2

Blood culture as an element of the PNU2 criterion

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	Blood culture: *A. baumannii*
12		6	
13		7	
14		8	
15		9	
16		10	
17		11	
18		12	
19		13	
20		14	
21			

- PNU2 is met – blood specimen
- Blood specimen collection date within the IWP
- Blood is used as an element

PNU2 & Secondary BSI
Date of Event = Day 7
Pathogen: *A.baumannii*

BSI Secondary to PNEU – Scenario 2

Blood culture as an element of the PNU2 criterion

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	Blood [illegible]re: *Enterococcus faecalis*
12		6	
13		7	
14		8	
15		9	
16		10	
17		11	
18		12	
19		13	
20		14	
21			

- **Blood specimen collection date within the IWP**
- **Blood cannot be used as an element due to excluded pathogen**
- **PNU2 is not met**

BSI Secondary to PNEU – Scenario 2

Blood culture as an element of PNU3 criterion- **Immunocompromised definition must be met**

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate, Sputum : Few *Candida* species
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	Blood culture: *Candida albicans*
12		6	
13		7	
14		8	
15		9	
16		10	
17		11	
18		12	
19		13	
20		14	
21			

- PNU3 is met – blood specimen
- Matching Candida in blood and respiratory specimen
- Both specimens with collection date in the IWP
- Blood is used as an element

PNU3 & Secondary BSI
Date of Event: Day 7
Pathogen: Candida albicans

PNEU Definition

- CHAPTER 2:

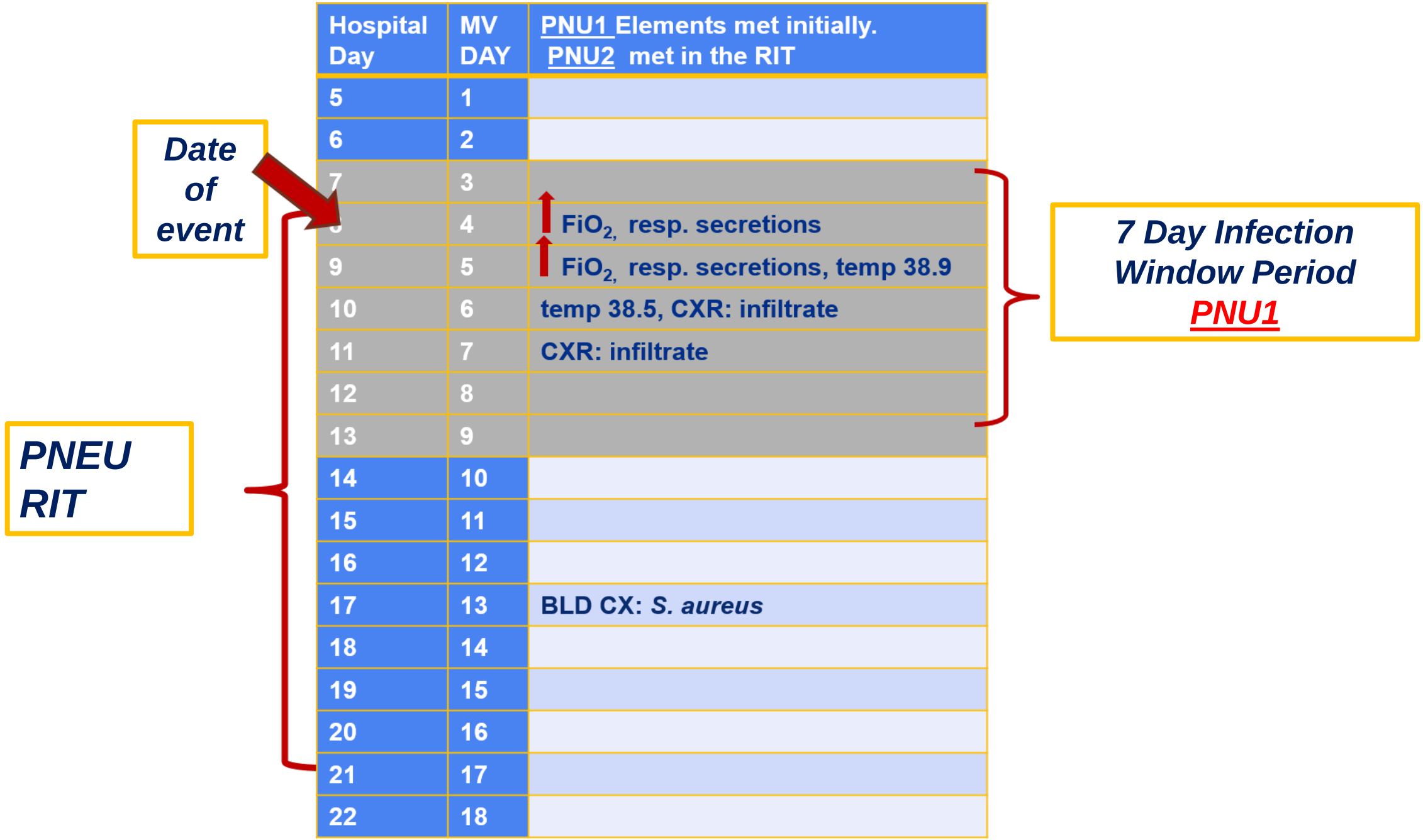
Repeat Infection Timeframe:

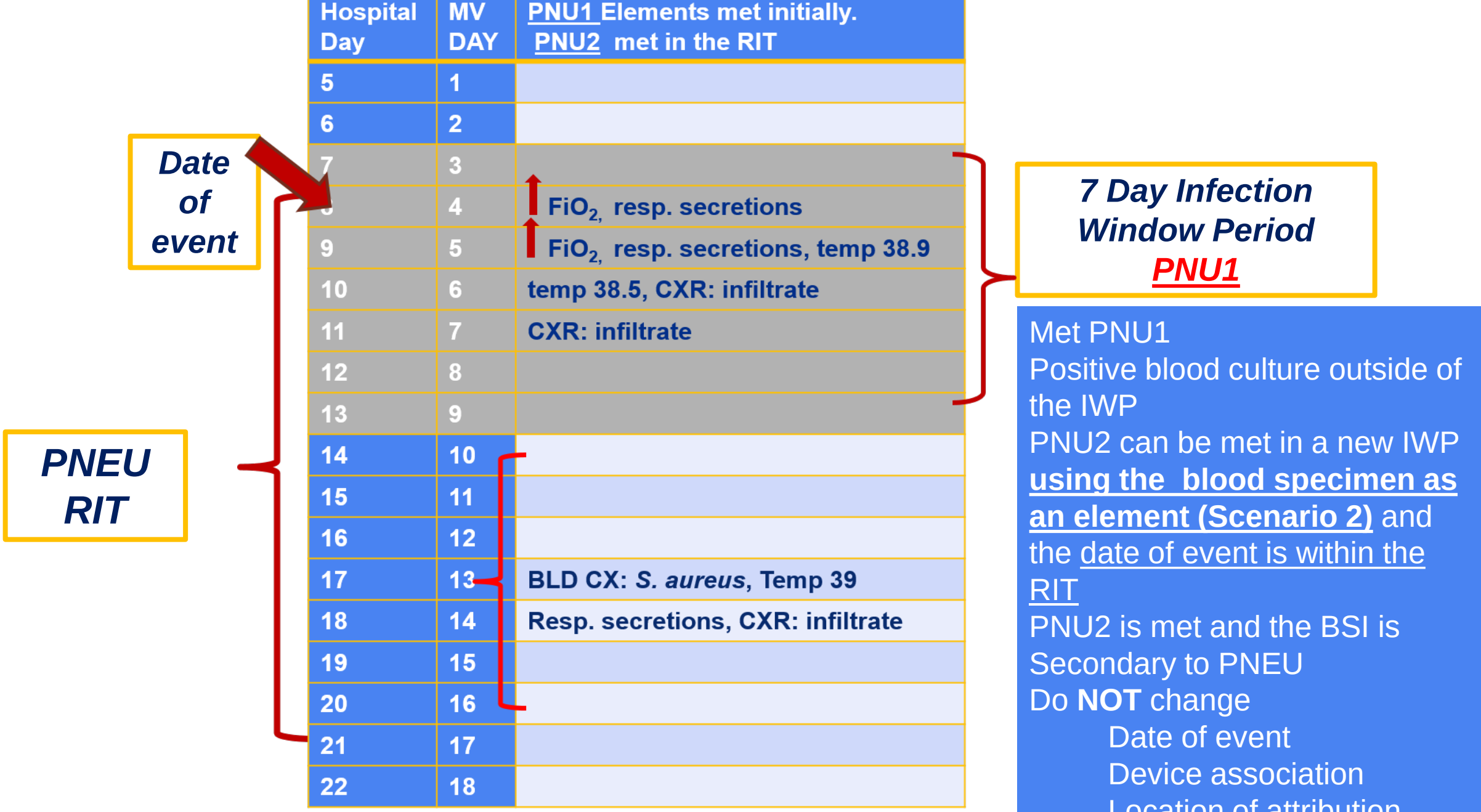
The Repeat Infection Timeframe (RIT) is a 14-day timeframe during which no new infections of the same type are reported.

- **The RIT applies to both POA and HAI determinations.**
- The date of event is Day 1 of the 14-day RIT.
- If criteria for the same type of infection are met and the date of event is within the 14-day RIT, a new event is not identified or reported.
- Additional pathogens recovered during the RIT from the same type of infection are added to the event.
- Note the original date of event is maintained as is the original 14-day RIT.
- Device association determination and location of attribution are not to be amended.

See examples in Table 5 and Table 6 below.

- Additional means of possibly attributing a secondary BSI
  - A modification of the specific event from PNU1 to PNU2 or PNU3
  - **Meeting Scenario 1 or 2 with a different criterion in the RIT**


Hospital Day
MV DAY
PNU1 Elements met initially.
PNU2 met in the RIT
5 1
6 2
7 3
4 FiO2, resp. secretions
9 5 FiO2, resp. secretions, temp 38.9
10 6 temp 38.5, CXR: infiltrate
11 7 CXR: infiltrate
12 8
13 9
14 10
15 11
16 12
17 13 BLD CX: S. aureus
18 14
19 15
20 16
21 17
22 18
Date of event
PNEU RIT
7 Day Infection Window Period
PNU1


Hospital Day
MV DAY
PNU1 Elements met initially.
PNU2 met in the RIT
5 1
6 2
7 3
4
9 5
10 6
11 7
12 8
13 9
14 10
15 11
16 12
17 13
18 14
19 15
20 16
21 17
22 18
FiO2, resp. secretions
FiO2, resp. secretions, temp 38.9
temp 38.5, CXR: infiltrate
CXR: infiltrate
BLD CX: S. aureus, Temp 39
Resp. secretions, CXR: infiltrate
Date of event
PNEU RIT
7 Day Infection Window Period
PNU1
Met PNU1
Positive blood culture outside of the IWP
PNU2 can be met in a new IWP using the blood specimen as an element (Scenario 2) and the date of event is within the RIT
PNU2 is met and the BSI is Secondary to PNEU
Do NOT change
Date of event
Device association
Location of attribution
Do NOT reset the RIT or SBAP

RETURN to BSI Secondary to PNEU – Scenario 1

Blood & site-specific specimen identification must match for at least [illegible] organism.

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cou[illegible]
8		2	Imaging[illegible]
9		3	E[illegible]
10			
11			
12			
		9	
	BC +	10	Blood C[illegible]: *S. aureus*
		11	
18		12	
19		13	
20		14	
21			

BUT WAIT THERE'S MORE

- [illegible] ***ot used as an element***

[illegible]o secondary BSI

PNU2

Date of Event = Day 7

Pathogen*: A.baumannii*

PNEU Definition

- CHAPTER 2:

Repeat Infection Timeframe:

The Repeat Infection Timeframe (RIT) is a 14-day timeframe during which no new infections of the same type are reported.

- **The RIT applies to both POA and HAI determinations.**
- The date of event is Day 1 of the 14-day RIT.
- If criteria for the same type of infection are met and the date of event is within the 14-day RIT, a new event is not identified or reported.
- Additional pathogens recovered during the RIT from the same type of infection are added to the event.
- Note the original date of event is maintained as is the original 14-day RIT.
- Device association determination and location of attribution are not to be amended.

See examples in Table 5 and Table 6 below.

- Additional means of possibly attributing a secondary BSI
  - **Meeting PNU2 “again” in the RIT**

BSI Secondary to PNEU

Blood & site-specific specimen identification must match for at least one organism OR Blood is used as an element .

Hospital Day	SBAP	RIT	Infection Window Period
1			
2			
3			
4			
5			
6			
7		1	New onset cough
8		2	Imaging test: Infiltrate
9		3	Fever > 38.0 C
10		4	Fever > 38.0 C
11		5	BAL: *A. baumannii*
12		6	
13		7	
14		8	Fever > 38.0 C, Rales
15		9	Imaging test: Infiltrate
16	BC+	10	Blood Culture : *S. aureus*
17		11	
18		12	
19		13	
20		14	
21			

PNEU RIT

- ***No match***
- ***Blood is used as an element and PNU2 met again in the RIT***

PNU2 & Secondary BSI

Date of Event = Day 7

Pathogen*: A.baumannii, S. aureus*

2019 PNEU Protocol

PNEU Protocol Clarifications in 2019

1. Update to Settings section to draw attention to the use of PNEU for Secondary BSI assignment.

Settings: Surveillance may occur in any inpatient pediatric location where denominator data can be collected, such as critical/intensive care units (pedICUs), specialty care areas (SCA), step-down units, wards, and long term care units. In-plan surveillance for ventilator-associated pneumonia (pedVAP) using the criteria found in this chapter is restricted to patients of any age in pediatric locations (excludes neonatal locations). In-plan surveillance conducted for mechanically-ventilated patients in adult locations (regardless of age) will use the Ventilator-Associated Event (VAE) protocol (see VAE chapter). The PNEU definitions are still available for those units seeking to conduct off-plan PNEU surveillance for mechanically-ventilated adult, pediatric and neonatal patients and non-ventilated adults, pediatric or neonatal patients. The PNEU definitions are also available for secondary bloodstream infection assignment when performing Central Line-Associated Bloodstream Infection (CLABSI) surveillance in ventilated or non-ventilated patients in any location. A complete listing of inpatient locations and instructions for mapping can be found in the CDC Locations and Descriptions chapter.

PNEU Protocol Clarifications in 2019

2. A new section titled *Guidance for Determination of Eligible Imaging Test Evidence* was created which contains original information and one new statement

Guidance for Determination of Eligible Imaging Test Evidence

- If only one imaging test is available it is acceptable for this to satisfy the imaging requirement for PNEU/VAP-POA determinations regardless of whether the patient has underlying pulmonary or cardiac disease.
- When multiple imaging test results are available, persistence of imaging test evidence of pneumonia is a requirement for all patients not just those with underlying cardiac or pulmonary disease.
- When identifying persistence of imaging test evidence of pneumonia, the second imaging test must occur within seven days of the first but is not required to occur within the Infection Window Period. The date of the first eligible imaging test will be utilized when determining if the PNEU/VAP criteria are met within the infection window period. All other elements of PNEU/VAP definition must be present within the infection window period.

Knowledge Check 5

PNEU definition can be used as a site-specific infection for secondary BSI attribution when conducting CLABSI surveillance

A. True

B. False

Knowledge Check 5

PNEU definition can be used as a site-specific infection for secondary BSI attribution when conducting CLABSI surveillance

A. True

B. False

Since all questions can’t be answered by Google…….

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