

Validation of Community acquired pneumonia (CAP) and Health care associated pneumonia (HCAP)

Note this form will be used for CAP including *Pneumocystis* pneumonia (PCP) and other community acquired causes of opportunistic pneumonias, as well as HCAP but will not include hospital acquired pneumonia (HAP) or ventilator associated pneumonia (VAP) in patients hospitalized for >48-72 hours.

I. CRITERIA FOR CLINICAL CONFIRMATION**A. Clinical support (answer the following based on review of admission notes):**

A1. Compatible clinical findings are present, from at least one of the 6 categories below.

- Yes
 No (findings denied or are not documented)
 Unknown (FLAG FOR ADJUDICATION)

(1) Recent onset or worsening **cough**; new onset of purulent **sputum** or change in character of sputum (gross appearance or by patient report); increased respiratory secretions or increased suctioning requirements; hemoptysis; new onset or worsening of **dyspnea**; new onset or worsening of **tachypnea**; new onset or worsening of **pleuritic chest pain**; **abnormal chest exam** (dullness, bronchial breath sounds, eegophony, rales, crackles, rhonchi, etc.); worsening gas exchange or increased oxygen requirements.

(2) New onset or worsening confusion, agitation, **lethargy**, **delirium**, disorientation, **altered mental status** that is not chronic; new onset or worsening of **fatigue**

(3) **Fever** >38 C (100.4F) or <36 C (96.8F); rigors, chills, night sweats

(4) Leukopenia (<4000 WBC/mm³) or leukocytosis (>12,000 WBC/mm³)

(5) **Nausea, vomiting, diarrhea, abdominal pain**; unable to eat or decreased PO intake; new onset or worsening of anorexia

(6) Other constitutional: **Headache**; **myalgia**; **sore throat**

A2. Patient status prior to admission (select one): Patients transferred from other acute care facilities are included if their initial presentation was for pneumonia. Those admitted for other reasons who developed a pneumonia > 48 hours after hospitalization are excluded; for these patients with hospital acquired pneumonia, check option (1) below and skip to Section II.

- Admitted from home / community-dwelling (0)
 Transferred from other acute care hospital (1)
 Transferred from on-site skilled nursing unit, other nursing home or skilled nursing facility (2)
 Transferred from other health care related facility (ie rehabilitation or psychiatric hospital) (3)
 Other, Specify: _____ (4)
 Unknown (9)

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A3. Indicate if the patient had any of the following risk factors for HCAP present on admission.

- Discharge from acute care hospital within the last 14 days of current infection (1)
- Discharge from acute care hospital within the last 90 days of current infection (2)
- Attended a hemodialysis clinic within 30 days of current infection (3)
- Received intravenous antibiotics or chemotherapy within last 30 days (4)
- Received wound care or ventilator care within last 30 days (4)
- Other, specify: _____
- None of the above are mentioned in the admission notes / information not available.
- Unknown (FLAG FOR ADJUDICATION)

B. Radiographic support**B1. Indicate whether radiographic data is from CXR and/or chest CT:**

- CXR
- CT scan. Use CT obtained within 48 hours of admit to determine findings if no CXR available.

B2. The radiographic findings (select one):

- Are compatible with pneumonia
- Are not clearly compatible with pneumonia; uncertain significance (FLAG FOR ADJUDICATION).
- No acute pulmonary process reported, lungs fields stated to be clear and/or no abnormality noted

Review the radiology report for the chest x-ray obtained **within 48 hours** of admission; if radiology report unavailable, use clinician notes. In cases of discrepancies between radiologist and other clinicians, the radiologist interpretation will be the gold standard.

Terms compatible with pneumonia: air-space or alveolar filling process, airspace disease, bronchogram, bronchopneumonia, consolidation, consolidative process, density, increased interstitial markings, increased lung markings, infection, infectious process, infiltrate, infiltration, infiltrative process, inflammation, inflammatory process, interstitial pneumonia, interstitial process, haziness, opacity, opacification, pneumonia, pneumonic process, pneumonitis, reticulonodular pattern, reticular markings.

Terms for lack of abnormalities: clear lungs; clear lung fields; no acute disease; no infiltrates or other findings noted above.

C. Antibiotic support (Check all that apply): Do not include antimicrobial prophylaxis.**C1. Did the patient receive antibiotics directed against a **bacterial infection** within 48 hours of admission?**

- Yes, antibacterial therapy
- No
- Unknown

C2. Did the patient receive antibiotics directed against a **viral, fungal, mycobacterial or parasitic cause of pneumonia within 5 days of admission? Do not include antimicrobial prophylaxis.**

- | | |
|--|--|
| <input type="checkbox"/> Yes, antiviral therapy | <input type="checkbox"/> Yes, anti-parasitic therapy |
| <input type="checkbox"/> Yes, anti-pneumocystis therapy | <input type="checkbox"/> No |
| <input type="checkbox"/> Yes, anti-mycobacterial therapy | <input type="checkbox"/> Unknown |
| <input type="checkbox"/> Yes, other anti-fungal therapy | |

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If C1 or C2 is YES, complete C3:

C3. Were antibiotics directed against the suspected or confirmed pathogen(s) continued for at least 2-3 days, with intention to complete a treatment course? (Check “no” if antibiotics were discontinued because a pathogen was “ruled-out.”)

- Yes
 No
 Unknown (FLAG FOR ADJUDICATION)

II. CLINICALLY CONFIRMED DIAGNOSIS BASED ON CHART REVIEW

1. Is this episode of pneumonia **clinically confirmed**? This requires **compatible clinical and radiographic findings and receipt of antimicrobial therapy, where A1=Yes; B1=Yes; and C1 or C2=Yes AND C3=Yes. A confirmed microbiologic diagnosis is not required. Check only one choice. If pneumonia was present on initial admission and nosocomial pneumonia also occurred, select 1st option only.**

- Yes, this is consistent with pneumonia present on initial admission.
 No pneumonia is present on admission.
 This is consistent with pneumonia that developed >48 hours after admission.
 Uncertain (FLAG FOR ADJUDICATION)

2. Is there **another diagnosis** that accounts for this patient’s presentation? Record diagnoses that explain the primary reason for hospitalization; **they may be in addition to or instead of pneumonia**. Mark all that apply; rely primarily on the discharge summary and attending notes for diagnoses if there are discrepancies.

- | | |
|---|--|
| <input type="checkbox"/> Exacerbation of obstructive lung disease:
COPD or asthma exacerbation | <input type="checkbox"/> Other non-pulmonary infection |
| <input type="checkbox"/> Acute bronchitis, Upper respiratory tract
infection (URI) or “Influenza-like” illness | <input type="checkbox"/> Lung cancer |
| <input type="checkbox"/> Congestive heart failure (CHF), Pulmonary
edema, “volume overload” | <input type="checkbox"/> Pulmonary embolism |
| <input type="checkbox"/> Acute lung injury/acute respiratory distress
syndrome (ALI/ARDS) | <input type="checkbox"/> Other, Specify _____ |
| <input type="checkbox"/> Sepsis / bacteremia | <input type="checkbox"/> Unknown / not documented |
| | <input type="checkbox"/> Unclear / FLAG FOR ADJUDICATION |
| | <input type="checkbox"/> No / None |

IF THIS IS A CONFIRMED DIAGNOSIS OF PNEUMONIA PLEASE CONTINUE WITH FORM. IF PNEUMONIA IS NOT CONFIRMED OR REQUIRES ADJUDICATION, STOP HERE.

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MICROBIOLOGIC DIAGNOSIS OF PNEUMONIA

1. Were any smears obtained? (**Review samples for bacterial culture obtained within initial 48 hours; review samples for other organisms within first 5 days of admission**)

- Yes → GO TO ITEM 2.
 No → SKIP TO ITEM 3.
 Unknown → SKIP TO ITEM 3.

2. Indicate the source of the specimen taken, the findings on smear, and if applicable, the specimen adequacy (only needed if reporting bacterial results). Refer to the list below and enter the letter(s) that correspond to the smear result.

- | | | |
|-------------------------------|--|--|
| a. Gram positive bacilli | f. Gram stain indeterminate / variable | i. Hyphae/pseudohyphae |
| b. Gram positive cocci | g. Pneumocystis | j. Yeast |
| c. Gram negative bacilli | h. Cryptococcus | k. Acid fast organisms (Ziehl Neelson stain) |
| d. Gram negative coccobacilli | | l. No organisms seen |
| e. Gram negative cocci | | |

Source of specimen:

Findings (insert letter code):

Specimen adequacy: defined as ≥ 25

PMN/100x field and ≤ 10 epithelial cells/100x field

a. Sputum

Adequate

Not adequate

Unknown/not documented

b. BAL fluid

c. Pleural fluid

d. Lung aspirate

e. Other, specify:

3. Were any cultures obtained? (This is for all specimens, including blood and respiratory.)

- Yes → GO TO ITEM 4
 No → SKIP TO ITEM 8.
 Unknown → SKIP TO ITEM 8.

For items 4-6-, refer to the list of organisms below and enter the letter that corresponds to the organism:

4. Was a positive quantitative culture of a protected brush specimen or quantitative BAL culture for a likely pathogen obtained?

Yes → GO TO Item 5.

No ↓ SKIP TO Item 6.

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Likely bacterial pathogens:

- a. Chlamydia
 b. Coxiella burnetii
 c. Enterobacter aerogenes
 d. Escherichia coli
 e. Haemophilus influenzae
 f. Klebsiella pneumoniae
 g. Legionella pneumoniae
 h. Moraxella catarrhalis
 i. Mycoplasma pneumoniae
 j. Neisseria meningitidis

Viruses

- A1. Adenovirus
 A2. Human Metapneumovirus
 A3. Influenza A (not H1N1)
 A4. H1N1 Influenza
 A5. Influenza B
 A6. Parainfluenza
 A7. RSV
 A8. Other, specify. _____

- k. Nocardia asteroides
 l. Pasteurella multocida
 m. Proteus species
 n. Pseudomonas aeruginosa
 o. Rhodococcus equi
 p. Serratia marcescens
 q. Staphylococcus aureus –
 METHICILLIN sensitive
 r. Staphylococcus aureus –
 METHICILLIN resistant
 s. Streptococcus pneumoniae
 t. Streptococcus pyogenes
 u. Group B streptococci

Fungi

- B1. Aspergillus
 B2. Candida
 B3. Coccidioides
 B4. Cryptococcus
 B5. Histoplasma
 B6. Other, specify. _____

Unlikely bacterial pathogens:

- v. Alpha-hemolytic streptococci
 w. Bacillus species
 x. Clostridium species
 y. Coagulase-negative
 staphylococci

Other bacteria:

- z. Other, specify _____

Mycobacteria

- C1. M. tuberculosis
 C2. M. avium
 C3. M. kansasii
 C4. M. gordonae
 C5. Other, specify below.

Other organism or result:

- D1. Specify: _____

- D2. Normal flora or No Growth

5. Indicate the likely pathogen with a letter: _____

→ GO TO Item 6 if other cultures also obtained

6. Indicate the source of each culture with a number and the pathogen(s) isolated with a letter.

Print the names of pathogens not listed in the "Other" column.

Sources: (1) Blood (3) Pleural fluid (5) Lung aspirate
 (2) BAL fluid (4) Sputum (6) Other

Source Pathogen(s) isolated, using letter code above. Other organisms not listed: No organism:

a. _____ | _____ | _____ and/or Other, specify: _____ None

b. _____ | _____ | _____ and/or Other, specify: _____ None

c. _____ | _____ | _____ and/or Other, specify: _____ None

7. Were any of the reported sources for specimens in Item 6 "Other" (6)?

Yes →

No ↓

8. Specify the source:

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2. Determine whether a **microbiological diagnosis** for clinically confirmed pneumonia cases is **definite**, **presumed** or **suspected** for bacterial pneumonia; **definite** or **suspected** for others. Leave blank if the diagnosis was not present; check all that apply.

SUSPECTED microbiologic etiology of any type of infectious pneumonia is present if:

- 1) Organism is not microbiologically confirmed;
- 2) Clinical and radiographic presentation was compatible with suspected etiology per the medical record;
- 3) Patient received antimicrobial therapy directed against the suspected organism with clinical improvement, or if the event of death, antimicrobial therapy against the suspected organism was prescribed.

BACTERIAL PNEUMONIA

- A. Suspected bacterial pneumonia is present
- B. Presumed bacterial pneumonia is present because there is identification of a likely pathogen based on gram stain and culture results from expectorated or induced sputum, or from endotracheal aspirate.
- C. Definite bacterial pneumonia is present because there is isolation of a likely pathogen from:
- Blood
 - Pleural fluid
 - Bronchoscopic specimen (protected brush at $>10^3$ cfu/ml or from BAL at $> 10^4$ cfu/ml).
 - Other normally sterile site (such as urine, cerebrospinal fluid, or other tissue)
 - Histological evidence of bacterial pneumonia in lung tissue (autopsy or biopsy)
 - Detection of Legionella or pneumococcal antigen in urine or blood
 - Diagnostic serologic findings for Chlamydia, Legionella, Mycoplasma; 4x-rise in titers $>3-6$ weeks

In definite cases, indicate the bacteria isolated that fulfill the criteria listed above:

<u>Likely bacterial pathogens:</u>	<u>Unlikely bacterial pathogens:</u>
<input type="checkbox"/> a. Chlamydia <input type="checkbox"/> b. Coxiella burnetii <input type="checkbox"/> c. Enterobacter aerogenes <input type="checkbox"/> d. Escherichia coli <input type="checkbox"/> e. Haemophilus influenzae <input type="checkbox"/> f. Klebsiella pneumoniae <input type="checkbox"/> g. Legionella pneumoniae <input type="checkbox"/> h. Moraxella catarrhalis <input type="checkbox"/> i. Mycoplasma pneumoniae <input type="checkbox"/> j. Neisseria meningitidis	<input type="checkbox"/> k. Nocardia asteroides <input type="checkbox"/> l. Pasteurella multocida <input type="checkbox"/> m. Proteus species <input type="checkbox"/> n. Pseudomonas aeruginosa <input type="checkbox"/> o. Rhodococcus equi <input type="checkbox"/> p. Serratia marcescens <input type="checkbox"/> q. Staphylococcus aureus – METHICILLIN sensitive <input type="checkbox"/> r. Staphylococcus aureus – METHICILLIN resistant <input type="checkbox"/> s. Streptococcus pneumoniae <input type="checkbox"/> t. Streptococcus pyogenes <input type="checkbox"/> u. Group B streptococci <input type="checkbox"/> v. Alpha-hemolytic streptococci <input type="checkbox"/> w. Bacillus species <input type="checkbox"/> x. Clostridium species <input type="checkbox"/> y. Coag-negative staphylococci <u>Other bacteria:</u> <input type="checkbox"/> z. Other, specify.

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B. Pneumocystis Pneumonia (PCP)

- Suspected PCP
- Definite PCP is present because *Pneumocystis* cysts and/or trophic forms were visualized on microscopic examination of lung derived specimens (e.g., induced sputum, BAL, lung tissue).

C. Fungal pneumonia: Use the table below to indicate definite fungal pneumonia other than PCP.

- Suspected fungal pneumonia
- Definite fungal pneumonia, with specific etiology noted below, is present based on microscopic, histopathologic or culture results of respiratory-derived specimens; and/or positive serologic or antigen testing.

D. Viral pneumonia: Use the table below to indicate definite viral causes of pneumonia.

- Suspected viral pneumonia
- Definite viral pneumonia, with specific etiology noted below, is present based on histopathologic or culture results, or PCR-based tests of respiratory-derived specimens.

E. Mycobacterial pulmonary infections: Use the table below to indicate definite mycobacterial causes.

- Suspected mycobacterial infection
- Definite mycobacterial pulmonary infection, with specific etiology noted below, is present because Mycobacterium species were cultured from lung derived specimens, blood, or extrapulmonary site.

F. Other pneumonia: Use the table below to indicate definite other causes (e.g. parasitic).

- Suspected other infection
- Definite other infectious cause of pneumonia, with specific etiology as noted below, is present based on microscopic, histopathologic or culture results of respiratory-derived specimens; and/or positive serologic or antigen testing

G. Indicate all other organisms that were definite cause(s) of pneumonia above in C-F:

<u>Viruses</u>	<u>Fungi</u>	<u>Mycobacteria</u>
<input type="checkbox"/> A1. Adenovirus	<input type="checkbox"/> B1. Aspergillus	<input type="checkbox"/> C1. <i>M. tuberculosis</i>
<input type="checkbox"/> A2. Human Metapneumovirus	<input type="checkbox"/> B2. <i>Candida</i>	<input type="checkbox"/> C2. <i>M. avium</i>
<input type="checkbox"/> A3. Influenza A (not H1N1)	<input type="checkbox"/> B3. <i>Coccidioides</i>	<input type="checkbox"/> C3. <i>M. kansasii</i>
<input type="checkbox"/> A4. H1N1 Influenza	<input type="checkbox"/> B4. <i>Cryptococcus</i>	<input type="checkbox"/> C4. <i>M. gordonae</i>
<input type="checkbox"/> A5. Influenza B	<input type="checkbox"/> B5. <i>Histoplasma</i>	<input type="checkbox"/> C5. Other, specify below.
<input type="checkbox"/> A6. Parainfluenza	<input type="checkbox"/> B6. Other, specify.	
<input type="checkbox"/> A7. RSV		<u>Other organism not specified:</u>
<input type="checkbox"/> A8. Other, specify.		<input type="checkbox"/> D1. Specify

H. Microbiologic diagnosis(-es) unclear; chart requires adjudication. Yes No

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