Pneumonia

ORG: M-282 (ISC)
Link to Codes

MCG Health
Inpatient & Surgical Care
29th Edition

Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Admission to Inpatient Care

Note: Some patients may be appropriate for Observation care. For consideration of observation care, see Pneumonia: Observation Care ISC.

Note: For patients with clinically active secondary conditions, see Pneumonia Multiple Condition Management Guidelines.

- Admission is indicated for **1 or more** of the following[A][B](1)(2)(5):NN
  - Hypoxemia (2)
  - Hemodynamic instability (1)(2)
  - Altered mental status that is severe or persistent (2)
  - Dehydration that is severe or persistent (8)
  - Ventilatory assistance[C] needed (eg, mechanical ventilation, noninvasive ventilation)(1)(2)
  - Bacteremia (if blood cultures performed)
  - Moderate-risk-category or high-risk-category patient[D] (Pneumonia Severity Index class IV or V, or CURB-65 score of 3 or greater) PSI Calculator CURB-65 Calculator(1)(2)(5)
  - Respiratory finding (eg, Tachypnea) that persists despite observation care(9)
  - Complicated pleural effusions (eg, empyema, loculated)(10)
  - Presence of risk factor for poor outcome (eg, gross hemoptysis, cavitary infiltrate, neuromuscular weakness, cystic fibrosis) (11)

- Isolation indicated that cannot be performed outside hospital setting

Alternatives to Admission

- Alternatives include(1)(2)(13)(14):
  - Outpatient care in emergency department, rapid treatment site, urgent care center, or medical office
    - History, physical examination, and assessment of risk factors
    - Chest x-ray and laboratory testing
    - Antibiotics and re-evaluation of hemodynamics, oxygenation status, and other parameters
    - Discharge on oral or parenteral antibiotics.
  - Observation. See Pneumonia: Observation Care ISC guideline as appropriate.
  - Home care(15)
    - Nursing visits for assessment and laboratory work
    - Parenteral antibiotics, respiratory therapy, and oxygen, as indicated
  - Recovery facility
    - Parenteral fluid and medication
    - Respiratory treatment and oxygen
    - Frequent assessment and treatment
    - Management of comorbidities

Hospitalization

Optimal Recovery Course

Day	Level of Care	Clinical Status	Activity	Routes	Interventions	Medications
1	• ICU[E] or floor • Social Determinants of Health Assessment • Adult Readmission Risk Assessment • Extended Stay Risk Assessment • Discharge planning	• **Clinical Indications met[F]** • Possible Fever, dyspnea, purulent sputum, pleuritic pain, Altered mental status	• Activity as tolerated	• Possible IV fluids • Parenteral or oral medications • Liquid or usual diet	• WBC • Possible ABG or oximetry • Blood culture • Possible sputum Gram stain and culture • Possible respiratory therapy • Probable oxygen • Possible thoracentesis • Incentive spirometry • Head of bed at 30 degrees	• IV antibiotics • Possible corticosteroids[G]
2	• Floor • Social Determinants of Health Assessment • Adult Readmission Risk Assessment • Extended Stay	• **No CO_2 retention or acidosis** • **No requirement for mechanical ventilation** • **Hypotension absent** • **Afebrile or fever improved**	• **Increased activity**	• Oral hydration • Oral medications • Usual diet	• Incentive spirometry • Pulse oximetry • Head of bed at 30 degrees • Possible oxygen	• IV or oral antibiotics • Possible corticosteroids

	Risk Assessment	• **No hypoxia on room air or oxygenation improved** • **Mental status improved or at baseline**				
3	• Social Determinants of Health Assessment • Adult Readmission Risk Assessment • Extended Stay Risk Assessment • Floor to discharge[H] • Complete discharge planning	• **Hemodynamic stability** • **Afebrile or temperature acceptable for next level of care** • **Tachypnea absent** • **Hypoxemia absent** • **Mental status at baseline** • **Antibiotic regimen acceptable for next level of care** • **Discharge plans and education understood**	• **Ambulatory or acceptable for next level of care**	• **Oral hydration[I]** • **Oral medications or regimen acceptable for next level of care** • **Oral diet or acceptable for next level of care**	• **Oxygen absent or at baseline need** • **Isolation not indicated, or is performable at next level of care** • WBC • Incentive spirometry	• Oral antibiotics • Possible oral corticosteroids

(2)(7)(13)(20)(21)(22)NN

Recovery Milestones are indicated in **bold**.

Goal Length of Stay: 2 days

Note: Goal Length of Stay assumes optimal recovery, decision making, and care. Patients may be discharged to a lower level of care (either later than or sooner than the goal) when it is appropriate for their clinical status and care needs.

Extended Stay

Note: See Pneumonia Multiple Condition Management Benchmarking Table for more detailed information.

Minimal (a few hours to 1 day), Brief (1 to 3 days), Moderate (4 to 7 days), and Prolonged (more than 7 days).

- Extended stay beyond goal length of stay may be needed for(2)(7):
  - Failure to meet discharge criteria (recovery milestones within final day in Optimal Recovery Course)
    - Expect brief stay extension.
  - Unclear diagnosis
    - Patient with negative cultures who is not recovering (eg, persistent signs and symptoms) on empiric antibiotics may require bronchoscopy, open lung biopsy, pleural biopsy, or changed antibiotic regimen.
    - Expect brief stay extension.
  - Pleural disease
    - Large pleural effusions or empyema may require repetitive drainage after diagnostic thoracentesis, chest tube drainage, or video-assisted thoracoscopy.

        - Expect brief stay extension.
    - Severe pneumonia or treatment failure(16)(23)
        - Nonresponsiveness to initial therapy has been associated with higher initial severity of infection (eg, high Pneumonia Severity Index or CURB-65 scores), hypoxemia, respiratory rate greater than 30 breaths per minute, and thrombocytopenia.(23)
        - Patient with necrotizing pneumonia or lung abscess may require longer hospital stay for recovery.(24)
        - Patient with extension of x-ray infiltrates, multilobar disease, or ongoing hypoxemia may require longer hospital stay for recovery.
        - Patient with bacterial and viral co-infection may have higher morbidity and require longer hospital stay.(25)
        - Expect brief stay extension.
    - Infection with antibiotic-resistant organism (eg, *Pseudomonas* species, *Acinetobacter* species, methicillin-resistant *Staphylococcus aureus* (MRSA))[B][J][K](3)(4)(28)
        - Patient infected with antibiotic-resistant organism may require multiple antibiotics, broader coverage, and more prolonged IV antibiotic course.
        - Expect brief stay extension.
    - Respiratory insufficiency or failure
        - Anticipate ventilatory support.[C](20)(22)(29)
        - Expect moderate stay extension.
    - New-onset hyponatremia (serum sodium concentration of 135 mEq/L (mmol/L) or less)
        - Anticipate close monitoring for signs and symptoms and of serum electrolytes.
        - Expect brief stay extension.
    - Clinically significant comorbid illness (eg, heart failure, atrial fibrillation with rapid heart rate, alcohol withdrawal, renal insufficiency, diabetes)
        - Anticipate evaluation and treatment of specific comorbidity.
        - Expect brief stay extension.
    - Comorbid acute exacerbation of obstructive lung disease (eg, COPD, asthma)(30)
        - COPD is associated with higher mortality, higher rates of ventilator-dependent respiratory failure, and *Pseudomonas* infection.
        - Expect brief stay extension.
    - Concomitant diagnosis of malignancy (eg, postobstruction pneumonia)
        - Malignancy may be associated with malnutrition, immunologic impairment, or bronchial obstruction.
        - Expect brief to moderate stay extension.
    - Altered mental status
        - Altered mental status disease may delay mobilization and recovery.
        - Expect brief stay extension.
    - Malnutrition(31)
        - Malnutrition is associated with higher mortality, higher rates of ventilator-dependent respiratory failure, and higher risk of sepsis and septic shock.
        - Expect brief stay extension.

See Common Complications and Conditions ISC for further information.

Discharge

Discharge Planning

- Discharge planning includes[L]:
    - Assessment of needs and planning for care, including(33)(34)(35):
        - Develop and modify treatment plan (involving multiple providers) as needed.
        - Evaluate and address preadmission functioning as needed.
        - Evaluate and address psychosocial status issues as indicated. See Psychosocial Assessment SR for further information.
        - Evaluate and address social determinants of health (eg, housing, food). See Social Determinants of Health Screening Tool SR for further information.(32)
        - Evaluate and address patient or caregiver preferences as indicated.

- Identify skilled services needed at next level of care, with specific attention to:
  - Medication management, adherence instruction, and side effects assessment(36)
  - Ongoing education required(37)
  - Respiratory status assessment

- Early identification of anticipated discharge destination; options include(34)(38)(39):
  - Home; considerations include:
    - Home safety assessment. See Home Safety Assessment SR for further information.
    - Patient safe to go home; examples include(40)(41)(42):
      - Medical status stable for patient's condition
      - Functional care can safely be provided with available resources.
      - Mental status stable for patient's condition
      - Medication availability confirmed and reconciliation complete
      - Patient/caregiver education completed with written discharge instructions provided
      - Community resources identified and referrals made, as needed
      - Home care arranged, if indicated
      - Necessary medical equipment delivery arranged or available in home, if indicated
      - Necessary medical supplies ordered, or patient/caregiver can obtain, if indicated
    - Access to follow-up care
    - Self-management ability if appropriate. See Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Assessment SR for further information.
    - Caregiver need, ability, and availability
  - Post-acute skilled care or custodial care as indicated. See Discharge Planning Tool SR for further information.
- Transitions of care plan complete, including(34)(38)(39)(43):
  - Patient and caregiver education complete.
    - See Teach Back Tool SR for further information.
    - See Pneumonia: Patient Education for Clinicians SR for further information.
  - Medication reconciliation completion includes(36)(44):
    - Compare patient's discharge list of medications (prescribed and over-the-counter) against provider's admission or transfer orders.
    - Assess each medication for correlation to disease state or medical condition.
    - Report medication discrepancies to prescribing provider, attending physician, and primary care provider, and ensure accurate medication order is identified.
    - Provide reconciled medication list to all treating providers.
    - Confirm that patient or caregiver can acquire medication.
    - Educate patient and caregiver.
      - Provide complete medication list to patient and caregiver.
      - Importance of presenting personal medication list to all providers at each care transition, including all provider appointments
      - Reason, dosage, and timing of medication (eg, use "teach-back" techniques)(45)
    - Encourage communication between patient, caregiver, and pharmacy for obtaining prescriptions, setting up home medication delivery, and reviewing for drug-drug interactions.
    - See Medication Reconciliation Tool SR for further information.
  - Plan communicated to patient, caregiver, and all members of care team, including(46):
    - Inpatient care and service providers
    - Primary care provider
    - All post-discharge care and service providers
  - Appointments planned or scheduled, which may include:
    - Primary care provider
    - Follow-up evaluation call. See Post-Acute Care Follow-Up Call Tool SR for further information.(35)
    - Infectious disease specialist(35)
    - Pulmonologist
    - Respiratory therapy(35)

        - Other
    - Outpatient testing and procedure plans made, which may include(47):
        - Laboratory testing
        - Radiology(35)
        - Other
    - Referrals made for assistance or support, which may include:
        - Alcohol and other drug abuse or dependence treatment(48)(49)
        - Community services
        - Financial, for follow-up care, medication, and transportation
        - Tobacco use treatment(48)(50)
        - Other
    - Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include:
        - Incentive spirometer(37)
        - Nebulizer
        - Oxygen and supplies
        - Other

Discharge Destination

- Post-hospital levels of admission may include:
    - Home.
    - Home healthcare. See Home Care Indications for Admission Section HC in Pneumonia guideline in Home Care.
    - Recovery facility care. See Recovery Facility Care Indications for Admission Section RFC in Pneumonia guideline in Recovery Facility Care.

Evidence Summary

Background

For patients with pneumonia suspected or known to be of viral etiology other than COVID-19 (eg, positive test for influenza), the Viral Illness, Acute ISC guideline is appropriate. For viral infection due to COVID-19, the COVID-19 ISC guideline should be used. If the etiology is bacterial or unknown (eg, treating with antibiotics empirically), the Pneumonia guideline is appropriate.

This guideline pertains to the vast majority of patients with pneumonia, including patients deemed to have healthcare-associated pneumonia (HCAP). HCAP is defined as pneumonia developing in a patient with one or more of the following healthcare contacts: residence in a nursing home or long-term care facility, wound care, IV chemotherapy or hemodialysis within the previous 30 days, or acute care hospitalization for 2 or more days within the previous 90 days.(1) **(EG 2)** Concerns have been raised as to whether a patient identified as having HCAP is truly more likely to be infected with a multidrug-resistant organism.(2)(3)(4) **(EG 2)**

Criteria

The evidence for the clinical indications found in this guideline includes 3 published peer reviewed articles, 2 specialty society or other evidence-based guidelines, and 4 book sections.

Analysis of national hospital discharge data for a commercially insured population shows 23.2% of patients seen in an emergency department with a principal diagnosis of pneumonia were admitted to inpatient care.(6) **(EG 3)** Analysis of national hospital discharge data for a Medicare-insured population shows 60.8% of patients seen in an emergency department with a principal diagnosis of pneumonia were admitted to inpatient care.(6) **(EG 3)** Analysis of an all-payer database shows a mean length of stay of 5.0 days for patients admitted to inpatient care.(7) **(EG 3)**

An emergency medicine textbook recommends that patients evaluated by the Pneumonia Severity Index (PSI) as high risk (class IV or V) should be admitted to inpatient care, that moderate-risk patients (class III) can be initially treated in observation care, and that, absent other indications for admission, low-risk patients (class I or II) can be treated as outpatients.(1) **(EG 2)** Clinical variables that are included in the PSI, and thus contribute to a higher risk score, are tachycardia, hypotension, altered mental status, tachypnea, and hypoxemia.(1) **(EG 2)** A specialty society guideline recommends use of the PSI in addition to clinical judgment in the evaluation of pneumonia patients and specifies that low-risk patients can be treated as outpatients.(2) **(EG 2)** This same guideline identifies

major and minor criteria that would denote a patient as having severe pneumonia (inpatient treatment appropriate, likely ICU). Examples include respiratory failure (ventilatory assistance needed), hypotension, hypoxemia, and altered mental status.(2) **(EG 2)** Another specialty society guideline also recommends the use of PSI to help identify patients who require inpatient care, specifically outpatient care for low-risk patients (class I or II), observation care for moderate-risk patients (class III), and inpatient care for high-risk patients (class IV or V).(5) **(EG 2)**

Hospitalization

A meta-analysis of 15 randomized controlled trials, encompassing 3252 patients with community-acquired pneumonia randomized to corticosteroid therapy or placebo in addition to usual care, found that the corticosteroid-treated group had a lower risk of all-cause mortality (relative risk (RR) 0.69, 95% confidence interval (CI) 0.53 to 0.89), less need for mechanical ventilation (RR 0.58, 95% CI 0.42 to 0.81), shorter hospital stays (mean difference (MD) -2.4 days, 95% CI -3.7 to -1 day), and shorter ICU stays (MD -1.45 days, 95% CI -2.51 to -0.39).(18) **(EG 1)** A subsequent specialty society guideline update recommends corticosteroids for patients with septic shock refractory to fluid resuscitation and for patients with severe community-acquired bacterial pneumonia.(19) **(EG 2)**

Length of Stay

A retrospective study of 2169 adults (median age 66 years) admitted with pneumonia found that 25% were discharged within 2 days.(21) **(EG 2)** Analysis of national hospital discharge data shows 26% of hospitalized adult patients with a principal diagnosis of community-acquired pneumonia were discharged in 2 days or less.(7) **(EG 3)**

Rationale

Use of this MCG care guideline helps the clinician identify patient-specific complex clinical factors that make it reasonable to expect a necessity for hospital care across 2 or more midnights. The evidence-based clinical criteria assist the clinician in the decision to appropriately admit a patient to inpatient care. For Medicare enrollees, MCG care guidelines also support the clinician in the decision to appropriately admit a patient to inpatient care when there is not an expectation of 2 or more midnights of hospital care (eg, CMS' Two-Midnight Rule exceptions).

Use of these evidence-based clinical criteria to support decision making around the need for inpatient treatment is of clinical benefit to the patient and is crucial for quality patient care. Use of evidence-based clinical criteria ensures patients receive the most appropriate care for their specific condition, reduces unnecessary risks, promotes recovery, and provides a standard that can reduce disparities in care. Evidence-based clinical criteria not only help align treatment decisions with best practice, but they can also help reduce unwarranted variation in care by fostering consistency and equality in healthcare provision across regions and facilities. Appropriate use of the evidence-based clinical criteria in conjunction with the Supplemental Medicare Criteria ensures Medicare patients receive full access to Medicare benefits (eg, inpatient care), without risk of delay or decreased access, based on variables such as clinical severity of illness, length of provision of medically necessary hospital-level care, or satisfaction of specified Medicare criteria as directed by CMS. Use of these criteria will help ensure that the patient receives necessary care in the appropriate setting.

Related CMS Coverage Guidance

This guideline supplements but does not replace, modify, or supersede existing Medicare regulations or applicable National Coverage Determinations (NCDs) or Local Coverage Determinations (LCDs).

Code of Federal Regulations (CFR): 42 CFR 412.3(12); 42 CFR 419.22(51); 42 CFR 422.101(52)

Internet-Only Manual (IOM) Citations: CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 1 - Inpatient Hospital Services Covered Under Part A(53); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 6 - Hospital Services Covered Under Part B(54); CMS IOM Publication 100-02, Medicare Benefit Policy Manual, Chapter 15 - Covered Medical and Other Health Services(55); CMS IOM Publication 100-08, Medicare Program Integrity Manual, Chapter 6, Section 6.5 - Medical Review of Inpatient Hospital Claims for Part A Payment(56)

Medicare Coverage Determinations: Medicare Coverage Database(57)

References