

Community Acquired Pneumonia UpToDateQuality Indicators **CMS/TJC NHIQM Quality Indicators:**

IMM-2: Influenza vaccine should be administered annually during the influenza season to hospitalized patients age 6 months and older if not previously received

TOB-1: Screening for tobacco use within the past 30 days should be performed within 3 days of admission

CMS EH CQM Quality Indicators:

EH 188: Guideline-consistent antibiotic regimen should be prescribed within 24 hours for hospitalized, immunocompetent patients with community-acquired pneumonia

Admit / Transfer UpToDate UpToDate

- *The 2007 consensus guidelines from the Infectious Diseases Society of America (IDSA) and the American Thoracic Society (ATS) recommend using either the CURB-65 or Pneumonia Severity Index (PSI) as a decision aid to guide the initial site of treatment for adults with community-acquired pneumonia (CAP). The guideline explicitly states that objective criteria should be applied as an adjunct to, rather than replacement for, physician decision making. (UpToDate)*
- *Patients who do not meet scoring criteria for hospitalization may still require hospital admission. These patients generally fall into one of four categories: pneumonia complications, exacerbation of underlying disease, inability to take oral medication reliably or other issues affecting outpatient care, or multiple risk factors falling just outside of scoring thresholds. (UpToDate)*

Admit inpatient to Medicine as soon as possible

Transfer

Condition

Good

Fair

Serious

Critical

Code Status:

Full code

Do not resuscitate

Activity

Up ad lib

Bed rest

Bed rest with bathroom privileges

Elevate head of bed

Up ad lib with assistance

Vital Signs

Check vital signs

IV**Crystalloid:**

Normal saline intravenously and

Lock IV:

Saline lock intravenous

Other Nursing

Assessments:

- Complete adult admission assessment
- Assess and document patient's smoking status
- Obtain weight every morning
- Complete pulmonary embolism prediction

Circulatory:

- Peripheral IV line care per protocol
- Insert peripheral IV line
 - antiembolism stockings
- Discontinue peripheral intravenous line
 - sequential compression device

Education:

- Provide disease/medical condition education UpToDate UpToDate
- Provide smoking cessation counseling UpToDate UpToDate

Fluid Balance:

- Intake and output

Respiratory:

- Maintain oxygen saturation between _____ and _____
- Monitor pulse oximetry

Cardiac:

- Continuous bedside cardiac monitoring

Precautions:

- Aspiration precautions

Protocols:

- Smoking cessation protocol UpToDate *Smoking cessation should be a goal for hospitalized patients with community-acquired pneumonia (CAP) who smoke.*

Urinary:

- Catheter care per protocol
- Discontinue indwelling urinary catheter
- Insert catheter

Therapies

Respiratory Therapy Service:

- _____ , _____ oxygen

Ventilation: UpToDate

Non-invasive ventilation

-
-
-
-
-
-

Medications

UpToDate UpToDate UpToDate

- For hospitalized patients not requiring intensive care unit (ICU) admission, UpToDate suggests initial combination therapy with an anti-pneumococcal beta-lactam (ceftriaxone, cefotaxime, ceftazidime, ertapenem, or ampicillin-sulbactam) plus a macrolide (azithromycin or clarithromycin XL), or monotherapy with a respiratory fluoroquinolone (levofloxacin or moxifloxacin) (Grade 1B). UpToDate suggests that monotherapy with tigecycline be limited to patients intolerant of beta-lactams and fluoroquinolones (Grade 2B). Coverage for drug-resistant pathogens, such as *Pseudomonas* or methicillin-resistant *Staphylococcus aureus* (MRSA), should be included in patients with risk factors. Doxycycline may be used as an alternative to a macrolide, especially in patients at high risk of QT interval prolongation. Oral therapy with a macrolide or doxycycline is appropriate only for selected patients without evidence of or risk factors for severe pneumonia. (UpToDate)
- Recent therapy or a repeated course of therapy with beta-lactams, macrolides, or fluoroquinolones are risk factors for pneumococcal resistance to the same class of antibiotic. (UpToDate)

Empiric Therapy - Combination Therapy:

ceftRIAXone sodium 1 gram intravenously every 24 hours

Or

Cefotaxime sodium 1 gram intravenously every 8 hours

Or

Ceftazidime sodium 600 mg intravenously every 12 hours

Or

Ertapenem sodium 1 gram intravenously every 24 hours

Or

Ampicillin-sulbactam 1.5 grams intravenously every 6 hours

Or

Ampicillin-sulbactam 3 grams intravenously every 6 hours

And

Azithromycin 500 mg intravenously every 24 hours

Or

Azithromycin 500 mg orally every 24 hours

Or

Clarithromycin extended release 24-hour tablet 1,000 mg orally every 24 hours

Or

Clarithromycin 500 mg orally every 12 hours

Or

Doxycycline hyclate 100 mg intravenously every 12 hours

Or

Doxycycline hyclate 100 mg orally every 12 hours

Or

Empiric Therapy - Single Agent Therapy:

Levofloxacin 750 mg intravenously every 24 hours

Or

Levofloxacin 750 mg orally every 24 hours

Or

Moxifloxacin HCl 400 mg intravenously every 24 hours

Or

Moxifloxacin HCl 400 mg orally every 24 hours

Empiric Therapy - *Pseudomonas* Risk Factors:

- In patients (particularly those with bronchiectasis or chronic obstructive pulmonary disease (COPD) and frequent antimicrobial or glucocorticoid use) who may be infected with *Pseudomonas aeruginosa* or other resistant pathogens, therapy should include agents effective against the pneumococcus, *P. aeruginosa*, and *Legionella* spp. Acceptable regimens include combination therapy with a beta-lactam antibiotic and a fluoroquinolone, such as the following regimens: piperacillin-tazobactam (4.5 g every six hours), imipenem (500 mg IV every six hours), meropenem (1 g every eight hours), cefepime (2 g every eight hours), or ceftazidime (2 g every eight hours) PLUS ciprofloxacin (400 mg every eight hours) or levofloxacin (750 mg daily). (UpToDate)

Piperacillin sodium-tazobactam sodium 4.5 grams (total piperacillin-tazobactam) intravenously every 6 hours

Or

Imipenem-cilastatin 500 mg intravenously every 6 hours (not to exceed 4 grams in 24 hours)

Or

Meropenem 1 gram intravenously every 8 hours

Or

Cefepime HCl 2 grams intravenously every 8 hours

Or

cefTAZidime 2 grams intravenously every 8 hours

And

Ciprofloxacin 400 mg intravenously every 8 hours

Or

Ciprofloxacin HCl 750 mg orally every 12 hours

Or

Levofloxacin 750 mg intravenously every 24 hours

Or

Levofloxacin 750 mg orally every 24 hours

Pathogen-Directed Therapy - MRSA:

Vancomycin HCl 15 mg/kg intravenously every 12 hours

Or

Linezolid 600 mg intravenously every 12 hours

Linezolid 600 mg orally every 12 hours

Bronchodilators:

Albuterol sulfate 90 mcg/actuation aerosol 2 inhalations via metered-dose HFA inhaler every 4 hours as needed for wheezing

Albuterol sulfate 2.5 mg/3 mL nebulizer solution 2.5 mg nebulized 4 times per day as needed for wheezing

Albuterol-ipratropium 100-20 mcg/actuation aerosol 1 inhalation via metered-dose inhaler 4 times per day as needed for wheezing

Albuterol-ipratropium 2.5-0.5 mg/3 mL nebulizer solution 3 mL nebulized 4 times per day as needed for wheezing

Ipratropium bromide 17 mcg/actuation aerosol 2 inhalations via metered-dose inhaler every 4 hours as needed for shortness of breath

Ipratropium bromide 0.5 mg/2.5 mL nebulizer solution 0.5 mg nebulized every 4 hours as needed for wheezing

Vaccines: UpToDate

- Vaccination can be administered at any time during hospitalization after the patient has become stable. (UpToDate)

Pneumococcal 23-valent polysaccharide vaccine 0.5 mL intramuscularly single dose UpToDate

Pneumococcal 13-valent conjugate vaccine 0.5 mL intramuscularly single dose

Influenza virus vaccine quadrivalent split (equivalent to Fluzone Quadrivalent) 0.5 mL intramuscularly single dose UpToDate

Influenza virus vaccine trivalent split (equivalent to Fluzone) 0.5 mL intramuscularly single dose

Influenza virus vaccine trivalent split high-dose (equivalent to Fluzone High-Dose) 0.5 mL intramuscularly single dose

Influenza virus vaccine trivalent adjuvanted (equivalent to Fludax) 0.5 mL intramuscularly single dose starting with next scheduled dose

Laboratory UpToDate

Chemistry:

Basic metabolic panel (serum)

Hepatic function panel (serum)

Hematology:

CBC with differential (blood)

Microbiology: UpToDate UpToDate

- Hospitalized patients with specific indications should have blood cultures and sputum Gram stain and culture and/or other tests as indicated. (UpToDate)
- The 2007 Infectious Diseases Society of America and the American Thoracic Society (IDSA/ATS) consensus guidelines recognize the limitations of sputum Gram stain and culture. The guidelines recommend that pretreatment sputum Gram stain and culture of expectorated sputum be performed only if a good quality sputum can be obtained, with appropriate measures in place for collection, transport and processing to assure quality performance. (UpToDate)
- According to the 2007 Infectious Diseases Society of America and the American Thoracic Society (IDSA/ATS) consensus guidelines on community-acquired pneumonia (CAP), the pneumococcal urinary antigen assay may augment the standard diagnostic methods of blood culture and sputum Gram stain and culture, with the potential advantage of rapid results similar to those for sputum Gram stain. It is of particular value when antibiotic therapy has already been initiated, prior to obtaining a sputum sample; specimens may remain positive three days after antibiotic initiation. A disadvantage compared to culture is the inability to test antibiotic sensitivity. (UpToDate)

Gram stain (sputum) *The specimen should be a deep cough specimen obtained prior to antibiotics.* (UpToDate)

Routine culture (sputum) UpToDate

Routine culture and sensitivities (blood) *Preferably before first antibiotic dose.*

Adenovirus DNA by PCR (nasopharyngeal swab)

Chlamydomphila pneumoniae DNA by PCR (nasopharyngeal swab) UpToDate

Influenza A/B antigen RNA by PCR (nasopharyngeal swab) UpToDate

Legionella antigen (EIA) (urine) UpToDate

Mycoplasma pneumoniae antibodies IgG and IgM (serum) UpToDate

Mycoplasma pneumoniae DNA by PCR (nasopharyngeal swab)

Parainfluenza virus RNA by PCR (nasopharyngeal swab)

Streptococcus pneumoniae antigen (urine) UpToDate

Blood Gases:

Arterial blood gas (arterial blood)

Mixed venous blood gas (blood)

Therapeutic Drug Levels:

Vancomycin trough before 4th dose (serum) UpToDate *Draw trough level before fourth dose: Target serum trough concentration of 15 to 20 mg/L.* (UpToDate)

Imaging UpToDate

- For hospitalized patients with suspected pneumonia and a negative chest radiograph, the 2007 Infectious Diseases Society of America and the American Thoracic Society (IDSA/ATS) consensus guidelines consider it reasonable to initiate empiric antibiotic therapy and repeat the chest radiograph in 24 to 48 hours. Alternatively, a computed tomographic (CT) scan could be performed in patients with a negative chest radiograph when there is a high clinical suspicion for pneumonia. (UpToDate)

X-Ray:

Routine inspiration PA/lateral X-ray of the chest today

Portable inspiration AP (upright) X-ray of the chest today

Computed Tomography:

- Computed tomography (CT) scanning is not generally recommended for routine use because the data for its use in community-acquired pneumonia (CAP) are limited, the cost is high and there is no evidence that it improves outcome. (UpToDate)
- Computed tomographic (CT) scan, especially high-resolution CT (HRCT), is more sensitive than plain films for the evaluation of interstitial disease, bilateral disease, cavitation, empyema, and hilar adenopathy. (UpToDate)

Chest CT scan without IV contrast today

Other Tests

Cardiac Testing:

12-lead ECG today

Consultations

Infectious Disease consultation today

Pharmacist consultation today

Physical Therapy consultation today

Pulmonology consultation today

Respiratory therapy consultation today
