Core Measure: Pneumonia Care – Initial Antibiotic Selection for CAP Immunocompetent -- Non ICU Patient

What We Know

Introduction

- The Joint Commission (TJC) is a national, nonprofit organization that accredits and certifies nearly 21,000 healthcare organizations (e.g., hospitals, ambulatory care centers) and programs in the United States. TJC seeks to continuously improve health care, patient safety, and patient outcomes through performance standards.
- In 1987, TJC inaugurated performance measures for improved patient outcomes with the Agenda for Change, which was subsequently titled the ORYX initiative. Through ORYX, hospitals could choose from thousands of performance measures to meet hospital accreditation. This approach led to an inability to compare healthcare organization data across systems. TJC utilized advisory panels in 1999 to reframe the next phase of ORYX for identification and use of evidence-based and standardized performance measures. Core measures were developed and pilot tested for reliability, validity, and feasibility in 83 hospitals in the nine states of California, Connecticut, Georgia, Michigan, Missouri, Rhode Island, Texas, South Carolina, and Virginia. Core measures are a nationally recognized standardized performance measurement system that must meet strict criteria. (For information about core measures, specific criteria, and changes for 2017, see the Evidence-Based Care Sheet: Core Measures: an Overview)
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- Effective in January 2015, Pneumonia (PN) Care was retired from mandatory reporting. While this core measure set has been retired because of consistently high performance rates, TJC continues to monitor and encourage hospitals to communicate solutions that might be helpful to other institutions.

The composite core measure set for PN Care includes the following:
- Blood Cultures Performed Within 24 Hours Prior to or 24 Hours After Hospital Arrival for Patients Who Were Transferred or Admitted to the ICU Within 24 Hours of Hospital Arrival (retired effective 1/1/2015); (Process measure)
- Blood Cultures Performed in the ED Prior to Initial Antibiotic Received in Hospital (retired 2013; voluntary reporting); (Process measure)
- Initial Antibiotic Selection for community acquired PN (CAP) in Immunocompetent Patients (retired in 2015; voluntary reporting to the CMS); (Process measure)
Issue: Initial Antibiotic Selection for CAP in Immunocompetent Non-ICU Patient

• PN is inflammation of the lung parenchyma caused by bacteria, viruses, fungus, and/or aspiration (e.g., food, liquid, dust) with varying onset, duration, and symptomology. PN may occur as a primary diagnosis or as a complication of a preexisting chronic medical disease. CAP is commonly caused by *Streptococcus pneumonia* and pneumococcal pneumonia. Other pathogens that can cause CAP include *Mycoplasma pneumoniae*, *Haemophilus influenza*, *Chlamydia pneumonia*, and some respiratory viruses. The different categories of PN are as follows: \(^{(1,2,3)}\)

- Healthcare-associated PN
- Ventilator-associated PN
- CAP

• The PN measure is focused on CAP

• PN is a significant cause of morbidity and mortality. PN causes more deaths worldwide than any other infectious disease. PN and influenza together are ranked as the eighth leading cause of death in the U.S. \(^{(1,2,3)}\)

• Very young children, older adults who are ≥ 65 years of age, immunocompromised patients, and immunocompetent high-risk patients have an increased risk for morbidity and mortality from PN \(^{(2,3)}\)

• The CDC reports 1.1 million inpatient hospital discharges as a result of PN in the U.S. in 2010 \(^{(2)}\)

• Overall, the average length of stay for admission to U.S. hospitals for PN in 2010 was 5.2 days, contributing to 1.128 million U.S. hospital discharges \(^{(4)}\)

• PN is one of the four original measure sets developed by TJC and announced in May of 2001 \(^{(2)}\)

• PN was responsible for an inpatient hospital death rate of 15.9 per 100,000 in 2014 \(^{(5)}\)

• PN was responsible for overall mortality in 50,622 persons in the U.S. in 2014 \(^{(2)}\)

Original Evidence Supporting Inclusion of Core Measures

• In North America, the guidelines for antibiotic treatment of CAP in immunocompetent patients are from the CDC, the Infectious Diseases Society of America (IDSA), the Canadian Infectious Disease Society/Canadian Thoracic Society, and the American Thoracic Society (ATS) \(^{(13)}\)

  − *S. pneumoniae* is the most common cause of CAP and the prevalence of antibiotic resistance to this pathogen is increasing. Antibiotic treatment that covers atypical pathogens (e.g., Legionella species, *M. pneumoniae*) is associated with improved survival

  − Joint consensus by the IDSA/ATS recommends a combination of empirical antibiotic treatment only for severe cases of CAP. Ertapenem is recommended as a β-lactam alternative for hospitalized patients with risk factors for PN infection positive for gram-negative pathogens other than *Pseudomonas aeruginosa*

• Authors of a study that compared 1,854 hospitalized patients with CAP who were treated with either beta-lactam/macrolide (BLM) or beta-lactam-monotherapy found that BLM therapy was associated with lower adjusted 14-day mortality risk and a lower adjusted risk of treatment failure at 14 days and at 30 days for patients with 2 or more of the following criteria: confusion, respiratory rate ≥ 30/minute, diastolic BP ≤ 60 mm Hg or systolic BP < 90 mm Hg, and age ≥ 65 years. The most commonly prescribed β-lactam agents were second- or third-generation cephalosporins or aminopenicillins plus β-lactamase inhibitors combined with clarithromycin \(^{(14)}\)

Current Evidence Supporting/Not Supporting Core Measure

• In a systematic review of the literature, investigators who evaluated the evidence for PN performance measures found the studies on antibiotics that were administered within 6 hours of hospital arrival to be of low or very low quality. The balance among the benefits of decreased mortality, decreased likelihood of a prolonged hospital stay, and risks of an inappropriate antibiotic use and misdiagnosis is not known. Investigators noted that early administration of antibiotics may be beneficial to high-risk patients (e.g., patients with septicemia) \(^{(12)}\)

• TJC treatment guidelines for patients not admitted to the ICU with PN include administering any of the following regimens: \(^{(11)}\)

  − A β-lactam (e.g., Ceftriaxone, Cefotaxime) administered I.V. or I.M. plus macrolide (e.g., ethryomycin) administered I.V. or PO
  − An antipneumococcal quinolone monotherapy (e.g., Levofloxacin) administered I.V. or PO
A β-lactam administered I.V. or I.M. plus doxycycline administered I.V. or PO

• For a hospitalized, non-ICU patient, the Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines recommend the following:(13)
  – A respiratory fluoroquinolone should be prescribed for patients who are allergic to penicillin
  – Empirical antibiotic monotherapy with a macrolide can be prescribed only for the treatment of hospitalized patients with nonsevere CAP who do not have risk factors for infection with drug-resistant pathogens

Specific Measures
• The numerator statement is defined by TJC as follows:(11)
  – “PN patients (as specified under the Set Measure Identifier and description) who received an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization”
• Included populations for the numerator are patients who are not admitted to the ICU with PN who received antibiotics consistent with current guidelines
• The denominator statement is defined by TJC as, “PN patients (as specified under the Set Measure Identifier and description) 18 years of age and older”:(11)
• Included populations for the denominator are patients who are discharged with both of the following:
  – An ICD-10-CM Principal Diagnosis Code of PN OR ICD-9-CM Principal Diagnosis Code of septicemia or respiratory failure, either acute or chronic
  – An ICD-10-CM Other Diagnosis Code of PN
• Excluded populations for the denominator are patients who
  – are less than 18 years of age
  – have a length of stay greater than 120 days
  – have a diagnosis of cystic fibrosis
  – did not have a chest X-ray or CT scan that indicated abnormal findings within 24 hours prior to hospital arrival or anytime during this specific admission
  – are documented to receive comfort measures only on the day of or day after admission
  – are enrolled in clinical trials
  – are transferred from the ED of another hospital
  – are transferred from an inpatient or outpatient department of another hospital
  – transfer from an ambulatory surgery center (ASC)
  – do not have a diagnosis of PN either as the ED final diagnosis/impression or direct admission diagnosis/impression
  – have a reason for receiving alternative empiric antibiotic therapy
  – are transferred/admitted to the ICU within 24 hours after arrival to this hospital and have a beta-lactam allergy
  – have a duration of stay that is ≤ 1 day
  – have another source of infection and did not receive an antibiotic regimen recommended for PN, but did receive antibiotics within the first 24 hours of hospitalization

Data Elements Included
• General data elements collected for the PN measure set include the following:
  – Admission date
  – Discharge date
  – First and last name
  – Gender
  – Ethnicity
  – Hispanic race
  – Payment source
  – Patient identifier
  – ICD-10-CM Other Procedure Codes
  – ICD-10-CM Other Procedure Dates
  – ICD-10-CM Principal Diagnosis Code
  – ICD-10-CM Principal Procedure Code
  – ICD-10-CM Principal Procedure Date
• Numerator data elements include the following:(11)
• Denominator data elements include the following:
  – Admission date
  – Another source of infection
  – Antibiotic administration date
  – Antibiotic administration time
  – Antibiotic name
  – Antibiotic received
  – Patient birthdate
  – Chest X-Ray
  – Clinical trial
  – Comfort measures only
  – Hospital discharge date
  – ICD-10-CM Other Diagnosis Codes
  – ICD-10-CM Principal Diagnosis Code
  – ICU Admission or transfer
  – PN diagnosis: ED/direct admit
  – Pseudomonas risk
  – Reason for alternative empiric antibiotic therapy
  – Transfer from another hospital or ASC

**Desired Outcome**

• The desired outcome is to \(^{(11)}\)
  – increase the rate/score/number of occurrences that immunocompetent patients who are not admitted to the ICU with CAP receive an initial antibiotic regimen consistent with current guidelines during the first 24 hours of their hospitalization
  – Decrease the rate of morbidity and mortality in patients with CAP

**Remaining Issues**

• The identification of multidrug resistant pathogens continues to increase. The FDA approved ceftaroline fosamil in 2010 and tigecycline in 2009 for the treatment of CAP. Judicious use of these antibiotics is warranted and more research is required to determine the clinical benefit and cost-effectiveness of ceftaroline fosamil and tigecycline compared with less expensive antibiotics\(^{(6)}\)

• Guidelines for CAP promote immunization at hospital discharge. Immunization is an important prevention strategy to decrease patient morbidity and mortality and healthcare costs associated with PN, particularly in adults who are 65 years of age. The evidence is limited on the prevention of PN with immunization but results of some studies demonstrate that morbidity and mortality are potentially preventable through immunization\(^{(17)}\)

• Research demonstrates that patients ≥ 65 years that are fee-for-service Medicare beneficiaries receive less effective care and poor health outcomes in hospitals with high rates of PN-specific ICU admissions\(^{(16)}\)

• Data from “America’s hospitals: Improving quality and safety. The Joint Commission’s annual report”, TJC’s quality and safety 2015 report for Joint Commission-accredited hospitals demonstrated\(^{(8)}\)
  – an overall 97.3% compliance rate for the PN care composite in 2014
  – 97.4% for antibiotics administered to non-ICU patients in 2014
  – an improvement of 2.2% since 2010

• Authors of a 2012 study who compared the efficacy of empirical therapy with beta-lactam plus macrolide with a beta-lactam plus doxycycline for the treatment of CAP among 858 patients concluded that both regimens demonstrated similar outcomes to atypical (e.g. *Legionella*) or typical CAP pathogens\(^{(15)}\)
What We Can Do

› While this core measure has been “retired” because of consistently high performance rates, TJC continues to monitor and encourage hospitals to communicate solutions that might be helpful to other institutions
› Learn the evidence-based, best practice reasons for following the Core Measure: PN Care -- Initial Antibiotic Selection for CAP Immunocompetent --Non ICU Patient and share this information with colleagues, new nurses, and patients and their family members
› Collaborate with your colleagues to promote accurate data collection
› Discuss core measures with treating clinicians
› Participate in the interrater reliability process to maintain accurate data collection
› Collaborate to develop guidelines to support the use of core measures
› Use/develop clinical pathways or care plans to structure care in a consistent, formalized manner
› Be aware of patients who are not included (e.g., patients who are < 18 years of age)

Related Guidelines

› Refer to the consensus recommendations by the IDSA/ATS for the management of CAP in adults; see https://www.thoracic.org/statements/resources/mp/idaats-cap.pdf
› Refer to TJC specifications manual and algorithm for Core Measure: PN Care --Initial Antibiotic Selection for CAP in Immunocompetent – Non-ICU Patient; see https://www.jointcommission.org/assets/1/6/HIQOR_Release Notes_4.4.pdf

References
