

## ***Episode-of-Care for Community-Acquired Pneumonia Hospitalization***

### **Measure Description**

Resource use and costs associated with management of adult episode following initial admission for community acquired pneumonia (CAP). Episode is defined to last 30 days from the day of admission to the hospital, and will also include the 3 days prior to admission. Measure pneumonia-related resource use and costs during the measurement period. Attribute pneumonia costs to the admitting physician.

### **Required Data Elements**

Administrative claims data

### **Calculation**

For patients meeting inclusion criteria, determine pneumonia-related resource use and costs during the episode. Prices from a standard price list will be applied to the pneumonia-related resource use to estimate the costs of the episode of care related to pneumonia. Hospital inpatient costs are based on per diem cost for a DRG and will be multiplied by length of stay for the event.

### **Episode Definition**

Pneumonia-related care over a 30 day period following hospital admission and within 3 days prior to admission. Trigger admission includes cases with pneumonia diagnosis as primary diagnosis. Additionally include other pneumonias as secondary with the following primary diagnoses: septicemia, respiratory failure, bacteremia, and empyema.

### **Rationale**

The Institute of Medicine and AQA have identified pneumonia as one of 20 conditions that should be considered priority areas in need of quality improvement based on its relevance to a significant volume of patients, its impact on those patients, and the perception of opportunity to significantly improve the quality and efficiency of related care. There may be up to 5 to 6 million cases of community-acquired pneumonia (CAP) diagnosed annually in the United States, accounting for approximately 1 million hospitalizations and approximately 10 million physician visits. It is estimated that the

annual cost of treating CAP in the United States is \$12.2 billion.<sup>1</sup> Pneumonia is the second most common reason for hospitalization after childbirth.<sup>2</sup>

Major decisions regarding management of CAP revolve around the initial assessment of severity, which will help determine whether hospitalization is necessary and the level of resources used.<sup>3</sup> CAP hospitalization episodes considered here include episodes initiated by an ambulatory care visit if there is a hospitalization within three days after that visit. Absent such a hospitalization, the episode will be potentially classified as a pneumonia ambulatory care episode. Individuals with prior hospitalizations within 90 days (>2 days LOS or pneumonia diagnosis with any LOS) or NH residence are excluded to eliminate hospital/institution acquired pneumonias.

The CAP hospital episode will be attributed at the individual physician level to the physician admitting the patient to the hospital.

### **Resource Use Measure**

Pneumonia-related resource use/costs

- Inpatient Facility
- Evaluation and Management
- Procedures
- Imaging
- Tests
- DME
- Pharmacy
- OP Facility Costs
- Exceptions/Unclassified
- Other Services

### **Eligible Population**

#### **Enrollment Criteria**

Continuous medical and pharmacy benefit enrollment for two years with no more than one gap in enrollment of more than 45 days during each year of the continuous enrollment.

#### **Age**

Patients at least 18 years of age or older during the identification year.

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1G. Colice et al. Treatment Costs of Community-Acquired Pneumonia in an Employed Population. *Chest* 2004; 125: 2140-2145.

<sup>2</sup> “Pneumonia Most Common Reason for Hospitalization.” AHRQ.  
<http://www.ahrq.gov/news/nn/nn070208.htm>.

<sup>3</sup> L.Madel et al. Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults. *CID* 2007; 44: S27-72.

**Inclusion Criteria** Occurrence of one of the diagnostic codes in Table CAP-A for a hospital admission during the identification period.

**Exclusion** Patient excluded if:  
  
Discharged from hospital after greater than 2 day stay for any reason within 90 days prior to trigger inpatient admission or discharged from hospital within 90 days prior to trigger admission (any LOS) with a CAP primary diagnosis.

Identified as resident of NH or as hospice patient.

Persons with E&M claim with pneumonia diagnosis between 4 days and 6 weeks prior to admission.

Persons meeting the following criteria are also excluded:

- Standard NCQA exclusions
- all lung cancer during identification (prior) or measurement year
- Exclude hospice if during prior 6 months.
- Exclude cystic fibrosis

**Table CAP-A: Diagnostic Codes to identify CAP Related Hospital Admissions for inclusion in CAP Hospitalization Episodes (Primary diagnoses except where noted).**

Description	ICD-9 Code
Viral pneumonia	480.xx
Pneumonia due to adenovirus	480.0
Pneumonia due to respiratory syncytial virus	480.1
Pneumonia due to parainflenza virus	480.2
Pneumonia due to sars associated coronavirus	480.3
Pneumonia due to virus not elsewhere classified	480.8
Viral pneumonia unspecified	480.9
Pneumococcal pneumonia	481.xx
Other bacterial pneumonia	482.xx
Pneumonia due to klebsiella pneumoniae	482.0
Pneumonia due to pseudomonas	482.1
Pneumonia due to hemophilus influenzae	482.2
Pneumonia due to streptococcus	482.3
Pneumonia due to staphylococcus	482.4
Pneumonia due to other specified bacteria	482.8
Bacterial pneumonia unspecified	482.9
Pneumonia due to other specified organism	483
Pneumonia due to mycoplasma pneumoniae	483.0

Pneumococcal pneumonia	483.1
Other bacterial pneumonia	483.8
Bronchopneumonia, organism unspecified	485
Pneumonia, organism unspecified	486
Influenza w. pneumonia	487.0
Aspiration pneumonia	770.14
Ornithosis with pneumonia	073.0
Friedlander's bacillus infection in conditions specified elsewhere and of Unspecified site (also as caused by kebsiella pneumonia)	041.3
<b>Pneumonia codes (see above) used as secondary diagnosis</b> with primary diagnosis of :	
Bacteremia	790.7
Empyema	510.xx
Unspecified pleural effusion	511.9
Septicemia	038.xx
Respiratory failure	518.81, 518.84

These ICD-9 codes, present in the primary diagnosis field, will be used to identify Pneumonia episodes during the measurement period.

**Table CAP-B: Codes Used to Identify Services/Costs to be Included During Episode:**

**Table CAP-B1: Diagnostic codes to identify clinically relevant services during a Pneumonia episode. (These codes may appear as primary or secondary diagnoses.)**

<b>Description</b>	
Pneumonia diagnoses	see PNEU-A diagnoses
Chest Pain	786.50
Fever	780.6
Asthma, unspec	493.90
Status Asthmaticus	493.91
Asthma unsp w/acute exacerb.	493.92
Bronchitis, acute	466.0
Cough	786.2
Influenza, NOS	487.1
Pneumonia, unspecified	486
Upper respiratory infection, unspec. Site	465.9
Shortness of breath	786.05
Respiratory disease, unspec.	519.9
Wheezing (excludes asthma)	786.07
Pleurisy	511.xx
Costochondritis	733.6
Clostridium-difficile	008.45

**Table CAP-B2: CPT Codes to identify services to be included in CAP Hospitalization Episode resource costs regardless of whether there is a pneumonia-associated diagnosis.**

Description	CPT Codes
X-Rays chest	71010-71035
CT Chest	71250, 71260, 71270
EKGs	93000, 93005, 93010, 93040, 93041, 93042
Bronchoscopy	31624, 31628
Inhalation Treatment	94640
Decortization, pulmonary	32220
Anesthesia-related procedures	00541, 00520
Blood Count (CBC)	85025
Bronchodilation, spirometry	94010, 94060
Non-invasive ear or pulse oximetry	94760
Carbon-Monoxide diffusing capacity	94720

**Table CAP-B3: Diagnostic Codes to identify CAP-Related Hospital Admissions for inclusion in CAP Episode Resource Costs – see CAP-A table.**

**Table CAP-B4: Evaluation and Management Codes**

Description	CPT Codes
General physician office visits	99201-99205, 99211-99215
Preventive medicine/screening	99394-99397, 99401-99404, 99411, 99412, 99420, 99429, 99384-99387
Observation care	99217-99220
Emergency dept care	99281-99285
Home health	99341-99345, 99347-99350
Skilled nursing facility	99304-99310, 99315, 99316, 99318, 99324-99328, 99334-99337
Office consultation	99241-99245
Unlisted	99455, 99456

These codes will be used to help identify those services that should be categorized as “E&M” during our analyses.

**Table CAP-B5: Pharmacy: Medications to Include in Pneumonia Episode Costs**

Description
Respiratory agents
Bronchodilators
Antibiotics
Anti-influenza meds (not antiretrovirals)
Steroids – all
O2
Antihistamines
Cough medicines
Nebulizers
Anti-fungals

**Table CAP-C: Episode Exclusions**

**Table CAP-C1: Exclusion Due to Possibility of Hospital-Acquired Pneumonia or NH-acquired Pneumonia**

Description
Hospitalization with 90 days with Pneumonia admission (see Table CAP-A)
Hospitalization within 90 days prior to trigger hospitalization, any reason, if LOS > 2 days.
May have resided in NH prior to trigger event (determined by medical visit in nursing home prior to trigger event or presence of NH claim).

**Table CAP-C2: Codes to Identify Active Cancer Treatment**

Description	ICD-9-CM Diagnosis
Cancer	140-208, 230-239

*WITH*

Description	CPT	ICD-9-CM Procedure	UB Revenue
Treatment	38230, 38240-38242, 77261-77799, 79000-79999, 96400-96549	41.0, 41.91, 92.2	028x, 033x, 0342, 0344, 0973

**Table CAP-C3: Codes to Identify ESRD – Excluded from analysis**

Description	CPT	HCPCS	ICD-9-CM Diagnosis	ICD-9-CM Procedure	UB Revenue	UB Type of Bill	POS
ESRD (including renal dialysis)	36145, 36800-36821, 36831-36833, 90919-90921, 90923-90925, 90935, 90937, 90939, 90940, 90945, 90947, 90989, 90993, 90997, 90999, 99512	G0257, G0311-G0319, G0321-G0323, G0325-G0327, G0392, G0393, S9339	585.5, 585.6, V42.0, V45.1, V56	38.95, 39.27, 39.42, 39.43, 39.53, 39.93, 39.94, 39.95, 54.98	080x, 082x-085x, 088x	72x	65

**Table CAP-C4: Codes to Identify Organ Transplant – Excluded from analysis**

Description	CPT	HCPCS	ICD-9-CM Procedure	UB Revenue
Organ transplant	32850-32856, 33930-33945, 44132-44137, 44715-44721, 47133-47147, 48160, 48550-48556, 50300-50380	S2152, S2053-S2055, S2060, S2061, S2065	33.5, 33.6, 37.5, 41.94, 46.97, 50.5, 52.8, 55.6	0362, 0367, 0810-0813, 0819

**Table CAP-C5: Codes to Identify HIV-AIDS**

Description	ICD-9-CM Diagnosis
HIV	042

**Table CAP-C6: Codes to Identify Cystic Fibrosis and Lung Cancer**

Description	ICD-9-CM Diagnosis
CF	277.0x
Lung Cancer	162.x

**Risk Adjustment Method**

Comorbid conditions indentified as HCCs in months preceding event date using inpatient and outpatient ICD-9 codes.

**Episode Severity / Disease Staging**

None

**Outlier Methodology**

All individuals are included in the analysis with costs winsorized at the 2<sup>nd</sup> and 98<sup>th</sup> percentile.

**Level of Measurement/Analysis**

Measurement will take place at the level of the individual provider. Attribution of resource use and costs for a patient will be assigned to the admitting provider.

*Note: Portions of these measure specifications are based on existing HEDIS and Prometheus measure specifications.*