In collaboration with the University of Pennsylvania, The University of California at San Francisco and Geisinger Health Systems, NCQA presents a complimentary 60 minute webinar session entitled:

**An Algorithm to Improve Appropriate Antibiotic Use for Patients With Acute Bronchitis**

April 26, 2011
3 p.m. – 4 p.m. ET
An Algorithm to Improve Appropriate Antibiotic Use for Patients with Acute Bronchitis

Session's Purpose and Learning Objectives:

Antimicrobial drug resistance among common bacterial pathogens is an increasing problem in community settings. Substantial evidence indicates that much of the problem can be attributed to unnecessary antibiotic use for non-bacterial acute respiratory tract infections. In particular, acute bronchitis is a common illness that is frequently treated with antibiotics despite considerable evidence indicating no benefit from antibiotic treatment. As a result, NCQA’s HEDIS measure focuses on the proportion of adult patients diagnosed with acute bronchitis who are NOT prescribed antibiotics. The speakers have developed a clinical algorithm to help guide antibiotic prescribing decisions for patients with uncomplicated acute bronchitis and improve performance on this HEDIS measure.

The specific learning objectives of this session are to:

1. Describe the evidence behind treatment guidelines for lower respiratory tract infections, including acute bronchitis.
2. Explain how to use a simple clinical algorithm based on vital signs and chest exam to guide antibiotic prescribing decisions for patients with acute respiratory tract infections.

Brief Description and Agenda: The 60 minute session will be divided into three sections. In the first section, we will review the data that support an algorithm to identify patients with acute cough illness who are not appropriate for antibiotic treatment. In the second section, we will describe the results of a recent cluster randomized trial that evaluated the impact of the algorithm on antibiotic prescribing rates. In the final section, we will describe the impact of different strategies to implement the acute bronchitis algorithm in primary care settings. The last fifteen minutes will be dedicated to questions and answers with the presenters.

Target Audience: This Webinar is designed for quality improvement managers and clinical lead physicians and nurses in ambulatory care networks.
Faculty:

Tammy Anderer, PhD, CRNP
Tammy Anderer is a Research Associate and the Associate Vice President Care Gaps Care Access for Geisinger's 40 primary care clinics. A board certified, practicing Family Nurse Practitioner, Dr. Anderer leads evidence based Clinical Decision Support, Best Practices, IT, Pay for Performance and Clinical Redesign strategies at Geisinger. Dr. Anderer's responsibilities include the development and optimization of evidence based primary care decision support for complex chronic illness (Diabetes, 2006; Coronary Artery Disease, 2007), and preventive care (Adult Prevention, 2008), medical home, medication reconciliation, electronic prescribing and closing care gaps.

Dr. Anderer has spoken nationally on Geisinger Clinical Decision Support and primary care transformation strategies and outcomes. Dr. Anderer completed a PhD in nursing research with a focus on primary care health outcomes at Duquesne University and completed Family Nurse Practitioner training at Pennsylvania State University. Dr. Anderer is currently a primary investigator on a CDC funded study in the area of reducing antibiotic usage in viral syndromes through electronic health record clinical decision support. Additionally, Dr. Anderer supports Geisinger Center for Health Research studies in the area of e-health, decision support and electronic health record data mining.

Ralph Gonzales, MD, MSPH
Ralph Gonzales completed his medical school and residency training in internal medicine at the University of California, San Francisco (UCSF), and then was awarded a primary care research fellowship at the University of Colorado Health Sciences Center. He currently holds the following positions at UCSF: professor of medicine, epidemiology, and biostatistics; associate chair for ambulatory care and clinical innovation; director of the Program in Implementation and Dissemination Sciences; and associate director of the Clinical and Translational Sciences K12 Career Development Program.

At UCSF, Dr. Gonzales helped design an innovative curriculum to meet the training needs of scholars whose interests lie in the translation of scientific evidence into medical practices and programs that improve the quality, efficiency, and safety of health care delivery. His own studies have represented the full spectrum of translational research—from the development of practice guidelines, to the implementation of innovative health care interventions, to the conduct of randomized community-based trials that examine the comparative effectiveness of different health care interventions. The types of interventions he has employed are multidisciplinary, patient-centered, and informed by relevant stakeholders and policy makers, including patients, community clinicians, professional societies, the National Committee for Quality Assurance (NCQA), and the Centers for Disease Control and Prevention.

Dr. Gonzales has also developed and tested health information technology that fosters the appropriate prescribing of antibiotics and encourages the active involvement of patients in their health care. He has applied this approach to women's health issues such as the prescription of emergency contraception and the provision of antibiotics for urinary tract infections.
Joshua Metlay, MD, PhD

Joshua Metlay is Professor of Medicine, Epidemiology and Emergency Medicine at the University of Pennsylvania School of Medicine. He is also a Senior Scholar in the Center for Clinical Epidemiology and Biostatistics and Senior Fellow in the Leonard Davis Institute of Health Economics at the University of Pennsylvania. Dr. Metlay received his bachelor’s degree from Yale University, his PhD in Immunology from Rockefeller University and his MD from Cornell University. He completed residency in internal medicine at the University of Pittsburgh and a fellowship in general internal medicine and epidemiology at the Massachusetts General Hospital. He also received a Masters of Science in Health Policy and Management from the Harvard School of Public Health.

Dr. Metlay’s research focuses on two complimentary areas: 1) the epidemiology of drug resistance among common bacterial respiratory pathogens, particularly S. pneumoniae and 2) the development and evaluation of interventions to improve the quality of treatment decisions for respiratory tract infections. Dr. Metlay’s research program is supported by federal grants from NIAID, CDC, and AHRQ. He has been an invited speaker at national and international conferences on pneumococcal drug resistance and interventions to improve antibiotic prescribing practices.

Dr. Metlay is the Co-Director of the Robert Wood Johnson Foundation Clinical Scholars program at Penn. He is the Chief of the Section of Hospital Medicine at the Hospital of the University at Pennsylvania and directs the Center for Healthcare Improvement and Patient Safety, a new research center focused on implementation science and clinical translation within healthcare delivery organizations.

This program does not offer CME or CNE credit.
Improving Management of Acute Respiratory Tract Infections

April 26, 2011
An Algorithm to Improve Appropriate Antibiotic Use for Patients with Acute Bronchitis

April 26, 2011

Presenters

• Tammy Anderer, PhD, CRNP
  Geisinger Health Systems

• Ralph Gonzales, MD, MSPH
  University of California, San Francisco

• Joshua Metlay, MD, PhD
  University of Pennsylvania
Acknowledgement

This study was supported by grant R01-C1000611 to Drs. Gonzales and Metlay from the Centers for Disease Control and Prevention.
Outline

- Rationale for improving antibiotic use for acute bronchitis
- An algorithm to improve management of patients with acute cough illness
- Implementation strategies for the acute cough management algorithm
Part I. Rationale for Improving Antibiotic Use for Acute Bronchitis
An Algorithm to Improve Appropriate Antibiotic Use for Patients with Acute Bronchitis

April 26, 2011

HEDIS Measure: Avoidance of Antibiotic Treatment in Adults with Uncomplicated Acute Bronchitis

- Measure validated with external chart review, and adopted 2005
- Excludes patients with HIV and chronic lung disease

<table>
<thead>
<tr>
<th>YEAR</th>
<th>COMMERCIAL</th>
<th>MEDICARE</th>
<th>MEDICAID</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>24.0</td>
<td>N/A</td>
<td>25.6</td>
</tr>
<tr>
<td>2008</td>
<td>24.6</td>
<td>N/A</td>
<td>25.8</td>
</tr>
<tr>
<td>2007</td>
<td>25.4</td>
<td>N/A</td>
<td>25.9</td>
</tr>
<tr>
<td>2006</td>
<td>28.7</td>
<td>N/A</td>
<td>28.0</td>
</tr>
</tbody>
</table>
• Acute bronchitis is a common reason for seeking medical attention

• Acute bronchitis has viral etiology in vast majority (>90% cases)

• Meta-analyses (n=9 RCTs) show no significant benefit of antibiotic treatment for adults with uncomplicated acute bronchitis
Resolution of Acute Bronchitis

Stott, BMJ 1976
Antibiotic treatment of acute bronchitis is common.
**Rationale for Decreasing Excess Antibiotic Use for Acute Bronchitis**

- Community-acquired antibiotic-resistance rates continue to rise
  - *S. pneumoniae* up to 25% macrolide resistant
  - *S. aureus* up to 60% methicillin resistant

- Recent antibiotic use important risk factor for carriage/infection with antibiotic-resistant bacteria
Antibiotic resistance rates are a function of local antibiotic use patterns.
Federal Mandate to Combat Antimicrobial Resistance

- Public Health Action Plan

- CDC Guidelines
  - “Appropriate Antibiotic Use for Uncomplicated Acute Bronchitis in Adults”
    - Multi-disciplinary panel (IM, EM, FP, ID)
    - Evidence-based medicine approach
    - Professional society endorsement (ACP, AAFP, IDSA)
# Differential Diagnosis of Acute Cough Illness

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>% of Total</th>
<th>Annual # Visits (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Bronchitis</td>
<td>40</td>
<td>4.2</td>
</tr>
<tr>
<td>URI</td>
<td>19</td>
<td>1.9</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>10</td>
<td>1.0</td>
</tr>
<tr>
<td>Asthma</td>
<td>7</td>
<td>0.7</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>4</td>
<td>0.4</td>
</tr>
<tr>
<td>Pharyngitis</td>
<td>2</td>
<td>0.2</td>
</tr>
</tbody>
</table>
Uncomplicated Acute Bronchitis
-CDC; ACP; AAFP; IDSA… 2001

- “The evaluation of adults with acute cough illness... should focus on ruling out serious illness, particularly pneumonia”

- In healthy, nonelderly adults, pneumonia is uncommon in the absence of vital sign abnormalities or asymmetrical lung sounds, and CXR is usually not indicated.

- When cough>3 weeks, CXR may be warranted in absence of other known causes.

Gonzales et al, Ann Intern Med 2001
Revised Pneumonia Probabilities based on PEx Findings in Acute Cough Illness (Baseline Pneumonia Prevalence = 5%)
Clinical Algorithm for Adults with Acute Cough Illness

**Low Prob Pneumonia**: nl vital signs + nl lung exam
- no chest xray
- no antibiotic Rx

**Interm Prob Pneumonia**: abnl vital signs OR abnl lung exam
- consider chest xray

**High Prob Pneumonia**: abnl vital signs + abnl lung exam
- chest xray
- consider empiric antibiotic Rx
Part II. Implementation of an Algorithm to Improve Management of Patients with Acute Bronchitis
Factors Influencing Antibiotic Prescription Decision

**Patient Factors**
- sociodemographics
- past experiences
- expressed expectations
- reported symptoms
- illness severity

**System Factors**
- practice setting
- health plan features
  - visit and pharmacy copay
  - patient enabling systems
  - formularies/restrictions
- pharmaceutical detailing

**Clinician Factors**
- sociodemographics
- training/specialty
- knowledge
- judgment and heuristics
- perceived patient expectations

Clinician's Decision to Prescribe Antibiotics
An Algorithm to Improve Appropriate Antibiotic Use for Patients with Acute Bronchitis

April 26, 2011

Fixing The Problem of Antibiotic Overuse

PRECEDE Model

- Predisposing, reinforcing and enabling constructs in educational diagnosis and evaluation

- Strong empirical evidence linking the incorporation of elements of the model with successful behavioral change interventions.
Implementation Strategy

Predisposing factors
• Provider education/seminar/guidelines

Reinforcing factors
• Clinical champion
• Clinic-level audit/feedback

Enabling factors
• Patient education
• Algorithm (Clinician Decision Support)
  – Poster-Based vs.
  – EHR-Based
Reinforcing Factors: Site Champions

- Each participating practice site identifies a local champion
- Champions participate in a training session, reviewing principles of appropriate antibiotic use
- Each site champion received data on prior year performance as well as teaching slides to provide feedback to their local site.
Enabling Factors: Patient Educational Materials

- CDC Get SMART Program
  - www.cdc.gov/getsmaxt
Enabling Factors: Poster-Based Algorithm
Enabling Factors: EHR Tool Development

• Series of focus groups with providers evaluating various stages of the tool

• Key goals identified
  – Work efficiency
  – Adaptability for complex visits
  – High level documentation
EHR-Based Decision Support

- Nurse triggered alerts based on chief complaint.
- PEx template triggers decision support message and Smart Set.
- Smart Set (bronchitis, pneumonia, sinusitis, URI, influenza) simplifies testing and treatment options based on Dx (can be accessed independent of PEx template).
- Template and Smart Set pre-populate assessment & plan note.
Part III:
A Clinical Trial of 2 Approaches to Providing Clinician Decision Support in Management of Acute Bronchitis
Cluster Randomized Clinical Trial

33 Primary care Sites

Control (N=11)

Poster (N=11)

Patient Brochures
Exam room posters
Site Champions

EHR (N=11)

Patient Brochures
EHR Tool
Site Champions

An Algorithm to Improve Appropriate Antibiotic Use for Patients with Acute Bronchitis
April 26, 2011
# Comparison of Patients with Acute Bronchitis across Study Sites

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control Sites (%)</th>
<th>Poster Sites (%)</th>
<th>EHR Sites (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 18-34</td>
<td>30</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>35-49</td>
<td>38</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>50-64</td>
<td>32</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>Fever (&gt;100.4)</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Tachycardia (&gt;100)</td>
<td>9</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Diabetes</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>
Physician Level Variation in Response to Intervention

% Change in Antibiotic Prescribing

Control Sites  Poster Sites  EHR Sites
Overall Impact of Intervention on Antibiotic Prescribing Levels

- Control Sites: +2.4%
- Poster Intervention: -10.2%
- EHR Intervention: -12.6%
Take Home Points

• Numerous trials have established that antibiotics do not improve outcomes for patients with uncomplicated acute bronchitis.

• An algorithm based on patient vital signs and chest examination can stratify patients into three risk groups with associated management strategies.

• The algorithm can be provided at the point of care using electronic or paper-based methods. Both are effective.
Resources

- Templates for patient brochures available at www.cdc.gov/getsma.../brochures.html

- Exam room poster templates will be posted on the NCQA website
QUESTIONS AND ANSWERS
Assess clinical probability of pneumonia

**Among elderly patients:**
Also consider pneumonia when altered mental status (clouded thinking), increased falls, loss of appetite or new urinary incontinence is present.

- **LOW** (< 5%)
  - No abnormal vital signs and normal chest exam
  - No CXR
  - No ABx

- **INTERMEDIATE** (5% - 30%)
  - One or more abnormal vital signs OR abnormal chest exam
  - Consider CXR*
  - ABx based on CXR results

- **HIGH** (> 30%)
  - One or more abnormal vital sign(s) AND abnormal chest exam
  - Perform CXR
  - Consider empiric ABx**

* CXR should be ordered on all patients with focal lung findings on physical examination.
** Abnormal vital signs are common with uncomplicated influenza infection when influenza is circulating in the community.

In the absence of pneumonia, consider the following diagnoses in adults with acute cough illness:

- **URI or Rhinosinusitis**
  - **Dx criteria**
    - cough plus nasal, throat and/or ear Sx
    - no dominant Sx

- **Acute bronchitis**
  - **Dx criteria**
    - cough dominant
    - +/- phlegm
    - rhonchi/mild wheezing common

- **Influenza**
  - **Dx criteria**
    - if cough + fever + myalgias/fatigue present, prevalence > 60%

- **Acute bacterial sinusitis**
  - **Dx criteria**
    - illness > 7 days
    - purulent nasal discharge
    - facial, head or teeth pain

The above algorithm is derived from clinical practice guidelines endorsed by the AAFP, ACP-ASIM, CDC, and IDSA.

This algorithm is designed to assist the clinician in the management of acute cough illness. The recommendations herein are not intended to replace a clinician’s judgement or to establish a protocol for all patients with a particular condition.
What is HEDIS?

**HEDIS® and Quality Compass®**

HEDIS is a tool used by more than 90 percent of America's health plans to measure performance on important dimensions of care and service. Altogether, HEDIS consists of 75 measures across 8 domains of care. Because so many plans collect HEDIS data, and because the measures are so specifically defined, HEDIS makes it possible to compare the performance of health plans on an "apples-to-apples" basis. Health plans also use HEDIS results themselves to see where they need to focus their improvement efforts.

HEDIS measures address a broad range of important health issues. Among them are the following:

- Asthma Medication Use
- Persistence of Beta-Blocker Treatment after a Heart Attack
- Controlling High Blood Pressure
- Comprehensive Diabetes Care
- Breast Cancer Screening
- Antidepressant Medication Management
- Childhood and Adolescent Immunization Status
- Childhood and Adult Weight/BMI Assessment

Many health plans report HEDIS data to employers or use their results to make improvements in their quality of care and service. Employers, consultants, and consumers use HEDIS data, along with accreditation information, to help them select the best health plan for their needs. To ensure the validity of HEDIS results, all data are rigorously audited by certified auditors using a process designed by NCQA.

Consumers also benefit from HEDIS data through the State of Health Care Quality report, a comprehensive look at the performance of the nation's health care system. HEDIS data also are the centerpiece of most health plan "report cards" that appear in national magazines and local newspapers.

To ensure that HEDIS stays current, NCQA has established a process to evolve the measurement set each year. NCQA’s Committee on Performance Measurement, a broad-based group representing employers, consumers, health plans and others, debates and decides collectively on the content of HEDIS. This group determines what HEDIS measures are included and field tests determine how it gets measured.

Included in HEDIS is the CAHPS® 4.0 survey, which measures members' satisfaction with their care in areas such as claims processing, customer service, and getting needed care quickly.

HEDIS is designed to provide purchasers and consumers with the information they need to reliably compare the performance of health care plans. HEDIS results are included in Quality Compass, an interactive, web-based comparison tool that allows users to view plan results and benchmark information. Quality Compass users benefit from the largest database of comparative health plan performance information to conduct competitor analysis, examine quality improvement and benchmark plan performance.
Avoidance of Antibiotic Treatment in Adults With Acute Bronchitis (AAB)

Antibiotics are most often inappropriately prescribed for adults with acute bronchitis. This measure assesses whether antibiotics were inappropriately prescribed for healthy adults 18–64 years of age with bronchitis and builds on an existing HEDIS measure that targets inappropriate antibiotic prescribing for children with URI.

Antibiotics are not indicated in clinical guidelines for treating adults with acute bronchitis who do not have a comorbidity or other infection for which antibiotics may be appropriate. Inappropriate antibiotic treatment of adults with acute bronchitis is of clinical concern, especially since misuse and overuse of antibiotics lead to antibiotic drug resistance. Acute bronchitis consistently ranks among the 10 conditions that account for most ambulatory office visits to U.S. physicians; furthermore, despite that the vast majority of acute bronchitis cases (more than 90 percent) have a nonbacterial cause, antibiotics are prescribed 65 percent–80 percent of the time. A lower rate indicates better performance. For all three inappropriate antibiotic use measures, the organization can influence physicians’ antibiotic prescribing behavior through interventions such as reminders of guideline recommendations, contracting and reimbursement based on physician profiles and claims payment. It can change clinical practice by monitoring and providing feedback to physicians about their prescribing behaviors. In addition, the organization can develop patient education interventions to discourage seeking antibiotics for viral conditions (such as the common cold), or without confirmatory tests such as group A strep test for pharyngitis, and to educate members about the importance of appropriate antibiotic use.

Avoidance of Antibiotic Treatment in Adults With Acute Bronchitis (AAB)

Summary of Changes from HEDIS 2010 Technical Specifications for Physician Measurement

- Deleted UB Revenue 077x from Table AAB-B.

Modifications from HEDIS 2011 Volume 2 Technical Specifications

- Includes Medical Record Specification for the numerator.
- Patient inclusion criteria for use by non-health plans.

Description

The percentage of adults 18–64 years of age with a diagnosis of acute bronchitis who were not dispensed an antibiotic prescription.

Calculation

The measure is reported as an inverted rate \(1 - (\text{numerator}/\text{eligible population})\). A higher rate indicates appropriate treatment of adults with acute bronchitis (i.e., the proportion for whom antibiotics were not prescribed).

Definitions

- **Intake Period**: January 1–December 24 of the measurement year. The Intake Period captures eligible episodes of treatment.
- **Episode Date**: The date of service for any outpatient or ED visit (Table AAB-B) during the Intake Period with any diagnosis of acute bronchitis (Table AAB-A).
- **IESD**: Index Episode Start Date. The earliest Episode Date during the Intake Period that meets all of the following criteria.
  - A 30-day Negative Medication History prior to the Episode Date (Table AAB-D)
  - A 12-month Negative Comorbid Condition History prior to the Episode Date
  - A Negative Competing Diagnosis during the 30 days prior to through 7 days after the Episode Date (inclusive)
  - The patient was continuously enrolled one year prior to Episode Date through 7 days after the Episode Date
Avoidance of Antibiotic Treatment in Adults With Acute Bronchitis

**Negative Medication History**
To qualify for Negative Medication History, the following criteria must be met.

- A period of 30 days prior to the Episode Date when the patient had no pharmacy claims for either new or refill prescriptions for a listed antibiotic drug
- No prescriptions filled more than 30 days prior to the Episode Date that are active on the Episode Date

A prescription is considered active if the “days supply” indicated on the date the patient filled the prescription is the number of days or more between that date and the relevant service date. The 30-day look-back period for pharmacy data includes the 30 days prior to the Intake Period.

**Negative Comorbid Condition History**
A period of 12 months prior to and including the Episode Date when the patient had no claims/encounters containing either a principal or a secondary diagnosis for a comorbid condition (Table AAB-C).

**Negative Competing Diagnosis**
A period of 30 days prior to through 7 days after the Episode Date (inclusive) when the patient had no claims/encounters with any competing diagnosis (Table URI-C).

### Eligible Population

<table>
<thead>
<tr>
<th><strong>Age</strong></th>
<th>18 years as of January 1 of the year prior to the measurement year to 64 years as of December 31 of the measurement year.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient inclusion criteria</strong></td>
<td><strong>Health plan.</strong> Continuous medical and pharmacy benefit enrollment 1 year prior to the Episode Date through 7 days after the Episode Date (inclusive) with no more than one gap in enrollment of up to 45 days from 365 days prior to the Episode Date through 7 days after the Episode Date.</td>
</tr>
<tr>
<td></td>
<td>To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, there may not be more than a 1-month gap in coverage (i.e., a patient whose coverage lapses for 2 months [60 days] is not continuously enrolled). The patient must be enrolled on the Episode Date.</td>
</tr>
<tr>
<td></td>
<td><strong>Non-health plan.</strong> Any claim or encounter transaction, including at least one pharmacy claim or prescription written during one year prior to the Episode Date.</td>
</tr>
<tr>
<td><strong>Event/diagnosis</strong></td>
<td>Outpatient or ED visit with any diagnosis of acute bronchitis during the Intake Period. Follow the steps below to identify the eligible population:</td>
</tr>
<tr>
<td><strong>Step 1</strong></td>
<td>Identify all patients in the specified age range who had an outpatient or ED visit (Table AAB-B) during the Intake Period with any diagnosis of acute bronchitis (Table AAB-A).</td>
</tr>
</tbody>
</table>
Table AAB-A: Codes to Identify Acute Bronchitis

<table>
<thead>
<tr>
<th>Description</th>
<th>ICD-9-CM Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute bronchitis</td>
<td>466.0</td>
</tr>
</tbody>
</table>

Table AAB-B: Codes to Identify Visit Type

<table>
<thead>
<tr>
<th>Description</th>
<th>CPT</th>
<th>UB Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient</td>
<td>99201-99205, 99217-99220, 99241-99245, 99385, 99386, 99396, 99401-99404, 99411, 99412, 99420, 99429</td>
<td>051x, 0520-0523, 0526-0529, 0982, 0983</td>
</tr>
<tr>
<td>ED*</td>
<td>99281-99285</td>
<td>045x, 0981</td>
</tr>
</tbody>
</table>

*Do not include ED visits that result in an inpatient admission.

**Step 2** Determine all acute bronchitis Episode Dates. For each patient identified in step 1, determine all outpatient or ED claims/encounters with a diagnosis of acute bronchitis.

**Step 3** Test for Negative Comorbid Condition History. Exclude Episode Dates for which the patient had a claim/encounter with a diagnosis for a comorbid condition during the 12 months prior to or on the Episode Date (Table AAB-C).

Table AAB-C: Codes to Identify Comorbid Conditions

<table>
<thead>
<tr>
<th>Description</th>
<th>ICD-9-CM Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV disease; asymptomatic HIV</td>
<td>042, V08</td>
</tr>
<tr>
<td>Cystic fibrosis</td>
<td>277.0</td>
</tr>
<tr>
<td>Disorders of the immune system</td>
<td>279</td>
</tr>
<tr>
<td>Malignancy neoplasms</td>
<td>140-209</td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td>491</td>
</tr>
<tr>
<td>Emphysema</td>
<td>492</td>
</tr>
<tr>
<td>Bronchiectasis</td>
<td>494</td>
</tr>
<tr>
<td>Extrinsic allergic alveolitis</td>
<td>495</td>
</tr>
<tr>
<td>Chronic airway obstruction, chronic obstructive asthma</td>
<td>493.2, 496</td>
</tr>
<tr>
<td>Pneumoconiosis and other lung disease due to external agents</td>
<td>500-508</td>
</tr>
<tr>
<td>Other diseases of the respiratory system</td>
<td>510-519</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>010-018</td>
</tr>
</tbody>
</table>

**Step 4** Test for Negative Medication History. Exclude Episode Dates where a new or refill prescription for an antibiotic medication was filled 30 days prior to the Episode Date or was active on the Episode Date (Table AAB-D).

**Step 5** Test for Negative Competing Diagnosis. Exclude Episode Dates where during the period of 30 days prior to 7 days after the Episode Date (inclusive), the patient had a claim/encounter with any competing diagnosis (Table URI-C).

**Step 6** Calculate the patient inclusion criteria.

**Step 7** Select the IESD. This measure examines the earliest episode per patient.

**Exclusion** None.
Electronic Specification

**Denominator**  The eligible population.

**Numerator**  Dispensed prescription for antibiotic medication (Table AAB-D) on or within three days after the IESD.

### Table AAB-D: Antibiotic Medications

<table>
<thead>
<tr>
<th>Description</th>
<th>Prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminoglycosides</td>
<td>• amikacin</td>
</tr>
<tr>
<td></td>
<td>• gentamicin</td>
</tr>
<tr>
<td></td>
<td>• kanamycin</td>
</tr>
<tr>
<td></td>
<td>• streptomycin</td>
</tr>
<tr>
<td></td>
<td>• tobramycin</td>
</tr>
<tr>
<td>Aminopenicillins</td>
<td>• amoxicillin</td>
</tr>
<tr>
<td></td>
<td>• ampicillin</td>
</tr>
<tr>
<td>Antipseudomonal penicillins</td>
<td>• piperacillin</td>
</tr>
<tr>
<td></td>
<td>• ticarcillin</td>
</tr>
<tr>
<td>Beta-lactamase inhibitors</td>
<td>• amoxicillin-clavulanate</td>
</tr>
<tr>
<td></td>
<td>• ampicillin-sulbactam</td>
</tr>
<tr>
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<td>• nitrofurantoin macrocrystals-monohydrate</td>
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*Note: NCQA will post a comprehensive list of medications and NDC codes to [www.ncqa.org](http://www.ncqa.org) by November 15, 2010.*
## Medical Record Specification

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<th>Denominator</th>
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<td>- The Hybrid Method</td>
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<td>- Sampling Methods</td>
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| Numerator   | Documentation in the medical record that the patient received a prescription for antibiotic medication (Table AAB-D) on or within three days after the IESD. Medical record documentation must include the date when the prescription was written. |

**Antibiotic prescription**
Principles of Appropriate Antibiotic Use for Treatment of Nonspecific Upper Respiratory Tract Infections in Adults: Background

Ralph Gonzales, MD, MSPH; John G. Bartlett, MD; Richard E. Besser, MD; John M. Hickner, MD, MSc; Jerome R. Hoffman, MD, MA; and Merle A. Sande, MD*

The following principles of appropriate antibiotic use for adults with nonspecific upper respiratory tract infections apply to immunocompetent adults without complicating comorbid conditions, such as chronic lung or heart disease.

1. The diagnosis of nonspecific upper respiratory tract infection or acute rhinopharyngitis should be used to denote an acute infection that is typically viral in origin and in which sinus, pharyngeal, and lower airway symptoms, although frequently present, are not prominent.

2. Antibiotic treatment of adults with nonspecific upper respiratory tract infection does not enhance illness resolution and is not recommended. Studies specifically testing the impact of antibiotic treatment on complications of nonspecific upper respiratory tract infections have not been performed in adults. Life-threatening complications of upper respiratory tract infection are rare.

3. Purulent secretions from the nares or throat (commonly observed in patients with uncomplicated upper respiratory tract infection) predict neither bacterial infection nor benefit from antibiotic treatment.

Upper respiratory tract infections (including the common cold) represent an important target for improving appropriate antibiotic use in ambulatory practice. In 1995, upper respiratory tract infection was the most frequent reason for seeking ambulatory care in the United States, resulting in more than 37 million visits to physician practices and emergency departments (1). Antibiotics are frequently prescribed for upper respiratory tract infections. The National Ambulatory Medical Care Survey, which specifically instructs participating physicians and staff on accurate diagnosis-coding procedures, revealed rates of antibiotic prescription for uncomplicated upper respiratory tract infection of 52% (2). Upper respiratory tract infection is the second leading condition for which antibiotics are prescribed each year, and it accounts for 10% of all antibiotics prescribed annually in ambulatory practice (3).

The overuse of antibiotics for upper respiratory tract infections has prompted attempts to better understand this practice. Physicians have reported that unrealistic patient expectations, patient pressure to prescribe antibiotics, and insufficient time to educate patients about the ineffectiveness of antibiotics are some of the reasons why antibiotics are prescribed for upper respiratory tract infections (4). However, the clinical presentation of patients also appears to affect the decision to prescribe antibiotics for upper respiratory tract infection. A study that used a standardized symptom and physical examination recording form concluded that clinicians identify and treat with antibiotics a subset of upper respiratory tract infections primarily characterized by the presence of purulent manifestations (5). Purulent or green nasal discharge (reported or observed), production of green phlegm, presence of tonsillar exudate, and current tobacco use were independent predictors of antibiotic treatment of upper respiratory tract infection. In this study, 82% of patients prescribed antibiotics had at least one of these factors, and a significant linear relationship was observed between the number of factors present and the likelihood of antibiotic prescription. These findings are consistent with those of a physician survey in which respondents were more likely to prescribe antibiotics for hypothetical cases of upper respiratory tract infection when purulent nasal discharge was present (6).

*After the primary author (Dr. Gonzales), authors are listed in alphabetical order.

In addition to the Centers for Disease Control and Prevention, the principles outlined in this document have been endorsed by the American Academy of Family Physicians, the American College of Physicians–American Society of Internal Medicine, and the Infectious Diseases Society of America.

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The goals of this paper are to provide evidence-based recommendations for when to apply the diagnosis of upper respiratory tract infection and when to consider antibiotic treatment of adults with an uncomplicated upper respiratory tract infection. The background to, rationale for, and methods used to develop these principles are published separately (7).

1.0 RECOMMENDATIONS

Recommendation 1. The diagnosis of upper respiratory tract infection should be used to denote an acute infection that is typically viral in origin and in which sinus, pharyngeal, and lower airway symptoms, although frequently present, are not prominent [B]. (Letters in square brackets are evidence ratings. See the background document in this issue [7] for explanation.)

1.1 Classification of patients with acute respiratory tract infections has traditionally been based on the anatomic localization of the prominent clinical signs and symptoms accompanying the illness (for example, sinusitis, pharyngitis, bronchitis, otitis media, and nasopharyngitis [the common cold]), and the diagnosis of “upper respiratory tract infection” has been reserved for cases with no prominent localizing features (8). It is very likely that clinicians vary in how they apply this taxonomy, since professional society recommendations for diagnosis of upper respiratory tract infection also vary. The International Classification of Health Problems in Primary Care defines “upper respiratory tract infection” as acute inflammation of nasal or pharyngeal mucosa in the absence of other specifically defined respiratory infection. Alternatively, the American Thoracic Society (9) and the Medical Research Council (United Kingdom) (10) recommend classification systems that do not include upper respiratory tract infection as an option. For example, the Medical Research Council provides the following options for classifying acute respiratory illnesses: common cold, otitis media, pharyngitis (including tonsillitis), laryngitis, croup, tracheitis, bronchitis, bronchiolitis, pneumonia, and influenza.

1.2 Evans (8) has conducted numerous studies of the microbiology of acute respiratory syndromes. He defines upper respiratory tract infection as “an undifferentiated clinical picture whose classification is based largely on the absence [italics added] of predominating features: thus the nose doesn’t run enough, the throat is not sore nor red enough, and the cough is not severe nor paroxysmal enough to classify the illness as one of the other respiratory syndromes.” With rare exceptions, upper respiratory tract infections have a viral cause (11–13). When symptoms are severe, and particularly when they are accompanied by muscle ache and fatigue, influenza and parainfluenza infections are the most common causes, whereas rhinoviruses predominate when symptoms are mild. Other agents that are important causes of upper respiratory tract infection syndromes in adults include adenovirus and respiratory syncytial virus.

1.3 Most cases of uncomplicated upper respiratory tract infections in adults resolve spontaneously, although a small proportion become complicated by bacterial rhinosinusitis or bacterial pneumonia (particularly in high-risk patients with influenza, such as infants, elderly persons, and chronically ill patients). Symptoms caused by upper respiratory tract infection typically last 1 to 2 weeks, and most patients will feel much better within the first week. Sinusitis usually develops after an upper respiratory tract infection because of obstruction of the sinus ostia, whereas bacterial pneumonia in adults with influenza infection usually results from the effects of influenza on host immunity. Although most patients with the common cold exhibit sinus involvement on computed tomography performed within 2 to 4 days of symptom onset (14), only about 2% of cases of the common cold in adults are complicated by acute bacterial sinusitis (15). Bacterial rhinosinusitis should be suspected when symptoms have lasted at least 7 days and the illness is accompanied by purulent nasal discharge and other localizing features (16). As described below, antibiotic treatment of upper respiratory tract infection has not been shown to alter the rates of these uncommon complications.

2.0 Recommendation 2. Antibiotic treatment of adults with nonspecific upper respiratory tract infection does not enhance illness resolution and is not recommended [A]. Studies specifically testing the effect of antibiotic treatment on complications of nonspecific upper respiratory tract infections have not been performed in adults. Life-threatening complications are rare.

2.1 Most randomized, placebo-controlled trials of antibiotic therapy for upper respiratory tract infections have been performed in children. A systematic review performed by the Cochrane Collaboration in 1998 evaluated trials in which patients with the diagnosis of up-
per respiratory tract infection or the common cold were treated with antibiotics or placebo (17). Trials in which 5% or more of participants had group A β-hemolytic streptococci on throat swab, those in which bronchitis was diagnosed, those in which patients had purulent sputum or purulent nasal discharge, and those in which symptoms lasted for more than 6 days were excluded. Analysis of seven trials including patients of all ages revealed that antibiotic treatment did not affect resolution of illness (summary odds ratio, 0.95 [95% CI, 0.70 to 1.28]) or loss of work time (measured in only one study). The three trials that enrolled adults only also showed no benefit of treating routine upper respiratory tract infections with antibiotics (18–20). In an additional randomized, controlled trial that compared penicillin with aspirin, no effect of antibiotic treatment was observed in hospitalized and ambulatory university students with nonspecific upper respiratory tract infection (21).

### 2.2 No published studies have specifically evaluated the effect of antibiotic treatment of upper respiratory tract infections on subsequent complications in adults. Among children, early antibiotic treatment of upper respiratory tract infection does not appear to prevent pneumonia or acute otitis media (22, 23). Systematic reviews by the Cochrane Collaboration report a consistent benefit of nasal decongestants in relieving nasal congestion associated with the common cold and equivocal results of treatment with zinc, echinacea, and humidified air (24–27). Some of the variation in treatment effects of zinc and echinacea on cold symptoms in different trials may be due to variation in doses of active ingredient and formulations. A randomized, placebo-controlled trial of zinc acetate (28), published after the systematic review (25), reported a 3- to 4-day decrease in duration of illness and a decrease in illness severity. Study participants began treatment on the first day of illness onset and ingested an average of 6 lozenges, each containing 12.8 mg of zinc acetate, daily for 4 to 5 days.

### 3.0 Recommendation 3. Purulent secretions from the nares or throat (commonly observed in patients with uncomplicated upper respiratory tract infection) predict neither bacterial infection nor benefit from antibiotic treatment [A].

Although physicians often rely on the presence of purulent nasal discharge and purulent sputum to assign more specific diagnoses, such as acute rhinosinusitis or acute bronchitis, in patients with acute respiratory illness, these symptoms are also common in patients with upper respiratory tract infection. When not accompanied by additional predictors of bacterial rhinosinusitis (such as illness lasting ≥7 days), purulent nasal discharge and purulent sputum are weak predictors of bacterial infection in adults with upper respiratory tract infection. Purulence occurs when inflammatory cells or sloughed mucosal epithelial cells are present and can result from either viral or bacterial infection (20, 29, 30). Likewise, tonsillar exudate can result from either
viral or bacterial pharyngitis (31, 32). Placebo-controlled trials in patients with acute nasopharyngitis have found no difference in outcomes between patients with and without purulent nasal discharge (20). Other studies have also failed to find a clinical benefit of antibiotic treatment of adults with cough who had purulent sputum (33, 34).

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Acknowledgments: External review has included feedback from the Centers for Disease Control and Prevention; the American College of Physicians–American Society of Internal Medicine Clinical Efficacy Assessment Subcommittee; and representatives of the American Academy of Family Practitioners, the American College of Emergency Physicians, and the Infectious Diseases Society of America.

Role of the Funding Source: Partial support for the development of the Principles was provided by the Centers for Disease Control and Prevention, and final approval by the Centers for Disease Control and Prevention of all manuscripts submitted for publication was required.

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References