Don’t Cover Your Cough!
Antibiotics for Acute Bronchitis?

Tamara Link, DNP, FNP-BC,
Family Nurse Practitioner

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Disclosure

- I have no actual or potential conflict of interest in relation to this program or presentation.
You should consider treating a healthy adult patient with acute bronchitis with an antibiotic when their cough exceeds 10 days.

A. True

B. False
Acute bronchitis in healthy adults is caused by a viral etiology in more than 90% of the cases.

A. True

B. False
Pretest Question 3

Discolored or purulent sputum alone in a patient with acute bronchitis is a good predictor of a bacterial etiology.

A. True

B. False
Pretest Question 4

Studies show that patient’s are usually dissatisfied with their visit if they expect an antibiotic prescription but don’t get one.

A. True

B. False
Why do we prescribe antibiotics for acute respiratory tract infections?
Factors Associated with Antibiotic Prescribing

Patient Factors
Influencing Antibiotic Prescribing

- Expectation or demand
- Previous experience with past treatment
- Misunderstanding of antibiotics for viral illness
- Physical symptoms or complaints

Agency for Healthcare Research and Quality. 2006; AHRQ Publication No. 04[06]-0051-4.)
True or False

Studies show that providers can almost always correctly identify patients who expect antibiotics.
FALSE!

Providers have only a "fair" accuracy in predicting which patients want Rx 1 out of 4

True or False

Patients who do not receive an antibiotic prescription are on average more dissatisfied with their office visit.
FALSE!

Numerous studies show that patient satisfaction is not adversely affected when they do NOT receive an antibiotic!

Ranji et al., *Med Care*, 2006; 46(8), 847–862
Snow et al., *Ann Intern Med*, 2001; 134(6), 134:518
Thoolen et al., *Health Psych Review*, 2012; 6(1), 92-112
Believe it or not!

Patient’s report greater satisfaction when they believe they have a good understanding of their illness.
Provider Factors

Influencing Antibiotic Prescribing

- Longer duration of practice
- Non-teaching practice setting
- Clinicians over 30 years old
- NPs/ PAs?
- Urgent care setting

Agency for Healthcare Research and Quality. 2006; AHRQ Publication No. 04[06]-0051-4
Dosh et al., *JFP*, 2000; , 49(5): 407-414
Other Provider Factors

- Uncertainty about diagnosis
- Abundance of caution
- Lack of knowledge
- Past experience with ARTI treatment
- Concern about not harming patient
- Busy! Wanting to expedite office visit
- Desire to avoid follow up visits
Are we harming our patients by not giving an antibiotic?

How many patients do you have to treat with an antibiotic to prevent ONE Hospitalization for pneumonia?
Number needed to treat to prevent 1 hospitalization for pneumonia: 12,255

Take a Guess

If you do NOT give an antibiotic prescription for ARTI visit, how much longer is the office visit?
ONE minute!

NOT giving an antibiotic prescription does not significantly increase the duration of an office visit

What is Acute Bronchitis?
Acute Bronchitis

- Self-limited acute respiratory tract infection (ARTI) lasting up to 3 weeks
- Characterized by inflammation of bronchial epithelium
- Clinical diagnosis based on predominance of cough.
- Only diagnosed when other respiratory conditions are ruled out.
In what percentage of cases of suspected acute bronchitis must you rule out Pneumonia?
ALL OF THEM!

Per CDC: Bronchitis is only diagnosed when you rule out more serious illnesses, particularly pneumonia
Etiology

- Etiology is viral in over 90% of the cases
  - Influenza A/B, parainfluenza 3, respiratory syncytial virus, corona virus, adenovirus, rhinovirus
- Bacteria only cause 5-10% of cases
  - Mycoplasma pneumoniae
  - Chlamydia pneumoniae
  - Bordetella pertussis
- CDC only recommends treating pertussis which comprises 1% of the cases

KroeningRoche et al., J Emerg Med, 2011: 43(2): 221-227
Pathophysiology
Acute phase 1-5 days

- Virus inoculates tracheo-bronchial epithelium
- Leads to inflammatory cell activation
- Characterized by mild constitutional symptoms

Gonzales and Sande. *Ann Inter Med*, 2000; 133 (12): 981-991
Pathophysiology
Protracted phase 1-3 weeks

- Hypersensitivity of tracheobronchial epithelium and airway receptors: bronchial hyper-responsiveness
- Thickening of bronchial and tracheal mucosa from inflammation
- Characterized primarily by cough
- Often accompanied by phlegm and wheezing
- Transient ↓ in FEV1 on PFT (40% of pts)

Gonzales and Sande. *Ann Inter Med*, 2000; 133 (12): 981-991
Think Inflammation!
Clinical Presentation

- Cough with or without sputum production < 3 weeks
- Localized symptoms: nasal congestion, runny nose, sore throat
- Systemic symptoms typically absent: fever, myalgia, nausea, malaise, and dyspnea.
- Bronchospasm and wheezing may be present
- No signs of lung consolidation
- Cough typically persists 10-20 days, with mean duration of cough 14-18 days

Purulent or discolored sputum is **NOT** a good predictor of bacterial etiology in patients with acute bronchitis.
TRUE!

50% of patients with acute bronchitis have purulent or discolored sputum and this finding should not sway you to prescribe an antibiotic.

Holzinger et al., Deut Arz Inter, 2014; 111: 356-363
Llor et al., BMJ, 2013; 347: 1-12
Smokers are more likely to have a bacterial etiology of acute bronchitis and should usually be treated with an antibiotic.
FALSE!

Yet smokers receive RX 1.5 times more often

Llor et al., *BMJ*, 2013; 347: 1-12
Clinical Practice Guidelines

- American College of Physicians (ACP)
- American College of Chest Physicians (ACCP)
- Centers for Disease Control (CDC)
- Agency for Healthcare Research and Quality (AHRQ)
Clinical Practice Guidelines apply to:

- Healthy adults age 18-64 y/o
- No significant comorbid conditions which might make an antibiotic appropriate:
  - Immunocompromised
  - Malignancy
  - Chronic lung disease
  - End-organ failure
National Quality Measures

- Healthcare Effectiveness Data and Information Set (HEDIS) since 2007

- According to HEDIS: The rate of antibiotic use for acute uncomplicated bronchitis in adults **should be zero**!
Do Antibiotics Help?

- No decrease in duration of illness
- No improvement in limitations in activity
- No decrease in time lost from work
- At best, antibiotics decrease the duration of cough by $\frac{1}{2}$ a day
- Treatment with antibiotics does not have a significant impact on potential complications

Smith et al., Cochrane Database Systematic Review, 2014
Resolution of Acute Bronchitis
With and without antibiotic

%Patients

Days with cough

Stott, BMJ, 1976
According to studies, how often are antibiotics prescribed in outpatient setting for acute bronchitis?
KroeningRoche et al., *J Emerg Med*, 2011; 43(2): 221-227
So what?
Consequences of antibiotic over use

- CDC (2013): antibiotic resistance is a global health threat
- Over 2 million illnesses per year
- 23,000 deaths
- Direct health care costs over $20 billion
- *Clostridium Difficile* infections, adverse drug reactions, increased cost of care.
- Resistant *Streptococcus pneumoniae*
Case Studies
Case Study #1

J.B. is 55 y/o WM with cough, fever, malaise, chills, sweats and feeling unwell for 3 days.

Vitals: temp 101.3, HR: 120, RR: 24, BP 124/82

His exam reveals a moderately ill appearing WM. Breath sounds reveal RLL crackles with decreased breath sounds and tactile fremitus.
Suspect Pneumonia

- **T**achycardia: HR > 100
- **T**achypnea: RR > 24
- **T**emp> 100.4
- Signs of focal consolidation
  - Rales/crackles
  - Egophony
  - Fremitus
- Gold standard for pneumonia: chest xray

File, *UpToDate*, 2015
Case Study #2

M.L. is a 77 y/o AF with cough and altered mental status. She has a temperature of 99.2, P: 98, RR 26.

Exam reveals a frail, slightly confused AF with decreased breath sounds worse on LLL but no definite crackles, rales, rhonchi.
Pneumonia in Elderly

- Atypical presentations

- In persons over 75 y/o obtain chest xray if:
  - RR >24
  - Decreased mental status and/or
  - Change in behavior

  *regardless of temperature*

Braman, *Chest* (supplement), 2006; 129(1), 95S-103S.
Case Study #3

J.G. is a 59 y/o BM. He c/o a cough for almost 2 weeks. He states his cough was initially intermittent, but now he has severe “coughing fits” followed occasionally by vomiting. His vitals are: T: 99.2, P: 92, RR 18, O2 sat 98%.

On exam, he has normal breath sounds.
Pertussis

- CDC: 1% of cases of bronchitis
- High index of suspicion with outbreaks or known contacts
- Consider dx if cough illness lasting 2 or more weeks including 1 or more of following:
  - Paroxysms of cough
  - Inspiratory “whoop”
  - Posttussive vomiting

Kroening-Roche, Soroudi, Castillor, and Vileke, 2011
Case study #4

A.L. is a 19 y/o WF who is home from college on Christmas break. She states her roommate was sick at the beginning of the week, now she “has it” for the past 2 days.

She c/o sudden onset of fevers, headache, chills, s/t, fatigue, and states OMG “my whole body hurts!”

Temp 102, P 99, RR 18, O2 sat 99%
Exam reveals a tired, moderately ill appearing, slightly diaphoretic WF with occasional cough. Lung exam is normal.
Influenza

- Most common pathogen isolated in patient with uncomplicated acute bronchitis
- Peak fall and winter months
- Sudden onset
- Annual epidemics
- Fever, myalgia, headache, s/t
- During outbreaks, the positive predictive values of clinical judgment is as good as a rapid test. (Snow, 2001)

Hart. NP, 2014; 39 (9): 33-39
Case study #5

R.V. is a 30 y/o HF with c/o cough, wheeze, and slight shortness of breath for 10 days.

She states her symptoms started like a cold, but now her cough persists and she is wheezing for the past week or so. She gets “bronchitis” at least twice a year and wants her zpack. Denies fevers, chills, or malaise.

VS: T: 99.0, P: 78, RR: 16, O2 sat: 97%
Exam: Healthy appearing HF with productive cough. Breath sounds reveal moderate expiratory wheezing and slight rhonchi throughout.
Consider Asthma

- Many patients with acute bronchitis actually have asthma.

- Consider asthma if
  - Wheezing
  - Female gender
  - One or more episode of wheeze, dyspnea in past year
  - Allergy induced symptoms
  - H/o 2 diagnosed cases of “acute bronchitis” in past 5 years (65% chance of asthma)

Gonzales et. al, Ann Int Med, 2000; 133 (12): 981-991
Thiadens et al., Scan J Prim Health Care, 2000; 18: 188-192
Treatment of Acute Uncomplicated Bronchitis

- Antitussive agents (mixed results but reasonable)
- Bronchodilators if evidence of airflow obstruction (wheezing)
- Mucokinetic agents (no consistent favorable effect)
- NSAIDS (helps with some symptoms but not cough)
- Inhaled corticosteroids (may be some benefit to high dose inhaled corticosteroids)
- No data to support use of oral corticosteroids in acute bronchitis when there is no asthma

How can we communicate with our patients who might expect an antibiotic?
Supportive strategies
What Patients want:

- To have their symptoms listened to
- To discuss worries and concerns
- To have their self-knowledge respected
- To have the severity, nature, and expected length of their illness explained
- To discuss treatment options
- To have their concern handled in one visit
- To be able to f/u with their provider by phone or email

Communication

- Call it a “chest cold” or “viral respiratory infection”
- Let them know what to expect
  - Duration of cough typically 10-14 days (up to 3 weeks)
  - Cough subsides in 75% by 2 weeks
- Explain that antibiotics do not significantly reduce the duration of symptoms

More communication

- Explain that antibiotics may cause adverse effects and lead to antibiotic resistance.
- Recent antibiotic use places your family at risk for carrying antibiotic resistant bacteria
- Consider delayed “pocket” prescription

Summary
Acute Uncomplicated Bronchitis in Adults
Age 18-64

- Acute bronchitis is a self-limited ARTI lasting up to 3 weeks with cough as predominant symptom
- Viruses cause more than 90% of the cases
- Antibiotics are not indicated (except if you suspect pertussis, an unusual circumstance).
- Rule out other respiratory illnesses
- Antitussives, bronchodilators, and inhaled steroids can be used in some patients
Figure. Proposed algorithm for evaluation and management of adults with acute cough illness.

Acute Cough Illness
< 3 weeks’ duration
With or without phlegm

Patient Characteristics
Elderly (age ≥ 65 years)*
Immunosuppression
COPD or CHF

Vital Sign Abnormalities
Heart rate > 100 beats/min,
respiratory rate > 24 breaths/min, or
body temperature > 38 °C (100.5 °F)

Yes
No

Is Influenza Likely?

Yes
Physical Examination Abnormalities
Suggestive of Consolidation or Pleural Effusion

No
Consider Chest Radiography To Rule Out Pneumonia

Negative
Positive

Treat Pneumonia

Acute Bronchitis Treatment Options†
Expectoration
Increase fluid intake
Humidify air
Cough Relief
Dextromethorphan or codeine
Bronchodilator
Pain Relief
NSAID or acetaminophen
Influenza Treatment
Anti-influenza therapy if symptoms < 48 hours’ duration and high clinical suspicion of influenza

You should consider treating a healthy adult patient with acute bronchitis with an antibiotic when their cough exceeds 10 days.

A. True

B. False
Acute bronchitis in healthy adults is caused by a viral etiology in more than 90% of the cases.

A. True

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Discolored or purulent sputum alone in a patient with acute bronchitis is a good predictor of a bacterial etiology.

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Post-test Question 4

Studies show that patient’s are usually dissatisfied with their visit if they expect an antibiotic prescription but don’t get one.

A. True

B. False
QUESTIONS?


