

**Coughs, Wheezes and
Respiratory Diseases:
A Look at Community Acquired
Pneumonia and Acute
Bronchitis**

Amelie Hollier, DNP, FNP-BC, FAANP
President, CEO Advanced Practice Education Associates
Lafayette, Louisiana

**Speaker has no
relationship to disclose.**

Objectives

- Develop an evidence-based medication plan to relieve symptoms in patients who have acute bronchitis (30 mins)
- Develop evidence-based medication plan to relieve symptoms in patients who have community acquired pneumonia (45 mins)
- Identify patients who are candidates for the pneumococcal vaccine (15 mins)

Acute Bronchitis

- Very common
- Self-limited inflammation of the bronchi
due to upper airway infection/inflammation

Etiology

Acute Bronchitis
Usually viral
5% *M. pneumoniae*
5% *C. pneumoniae*
Bordetella pertussis
Yet, 60-90% of patients receive antibiotics!

Sanford Guide, 2020.

Quiz

Why do most patients with acute bronchitis have purulent looking sputum?

When might antibiotics be indicated?

- Associated sinusitis
- Heavy growth on throat culture for *S. pneumo*, Group A *Strept*, *H. flu*
- **No improvement in 1 week**
- Otherwise, treatment is **SYMPTOMATIC!**

Sanford Guide 2020; JAMA 312:2678, 2014.

Purulent Sputum

IF patient has fever, rigors, systemic symptoms, get chest x-ray

First Step for Treatment of Cough

- Throat lozenges
- Hot tea
- Honey
- Smoking cessation or avoidance of secondhand smoke

What about cough suppressants/ guaifenesin?

- Central cough suppressants (codeine, DM)
- Peripheral cough suppressant (Tessalon), guaifenesin limited efficacy for cough due to URI
- There is no good evidence for or against the effectiveness of OTC medicines in acute cough

Smith SM, Schroeder K, Fahey T. Over-the-counter (OTC) medications for acute cough in children and adults in ambulatory settings. Cochrane Database Syst Rev. 2012 Aug 15;(8):CD001831. doi: 10.1002/14651858.CD001831.pub4. Update in: Cochrane Database Syst Rev. 2014;(11):CD001831. PMID: 22895922.

What about beta agonists?

- No significant diffs in daily cough scores, %age coughs at 7 days
- Quicker resolution of cough with beta agonists *if wheezing at baseline!*

Beta2-agonists for acute cough or a clinical diagnosis of acute bronchitis. Becker LA, Hom J, Villasis-Keever M, van der Wouden JC. Cochrane Database Syst Rev. 2015.

What about inhaled steroids?

- No support for use unless cough > 3 weeks

Johnstone KJ, Chang AB, Fong KM, Bowman RV, Yang IA. Inhaled corticosteroids for subacute and chronic cough in adults. Cochrane Database of Systematic Reviews 2013, Issue 3. Art. No.: CD009305. DOI: 10.1002/14651858.CD009305.pub2.

Acute Bronchitis: Etiology

Almost NO ONE has “acute bacterial bronchitis” unless:

- Tracheostomy, intubation
- COPD
- Elderly with multiple co-morbid
- Immunocompromised

JAMA 312:2678, 2014.

Patient RP

38-year-old male, non-smoker with BMI 29, well controlled HTN, lipids; was diagnosed with acute bronchitis 2 weeks ago. He reports that he is still coughing.

Is this unusual to be still be coughing 2 weeks post dx???

Quiz: How long does (an otherwise) healthy patient who has acute bronchitis usually cough?

1. < 7 days
2. 7-10 days
3. 2 weeks
4. 3 weeks

What must you consider if cough lasts > 14 days?

Pertussis!

- It's an example of acute bronchitis that IS treated with an antibiotic!
- *Bordetella pertussis, Bordetella parapertussis*
- 10-20% of adults with cough >14 days have pertussis

Sanford Guide, 2020

“100 days of cough”

3 Stages of Illness

- Catarrhal (1-2 weeks)
- Paroxysmal coughing (2-4 weeks)
- Convalescence (1-2 weeks)

Chest 146:205, 2014.

Diagnosis of Pertussis

- Microbiological confirmation needed for dx and public health surveillance

- *Bacterial culture

- *PCR

* Preferred by CDC

Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP). Broder KR, Cortese MM, Iskander JK, Kretsinger K, Slade BA, Brown KH, Mijalski CM, Twari T, Weston EJ, Cohn AC, Srivastava PU, Moran JS, Schwartz B, Murphy TV, Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2006;55(RR-3):1.

What is the most important question to ask a patient who has suspected pertussis?

Diagnosis of Pertussis

Bacterial culture

- Excellent specificity
- Best from nasopharyngeal area within 2 weeks of cough onset
- Risk of false negative increases after 2 weeks

Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP). Broder KR, Cortese MM, Iskander JK, Kretsinger K, Slade BA, Brown KH, Mijalski CM, Twari T, Weston EJ, Cohn AC, Srivastava PU, Moran JS, Schwartz B, Murphy TV, Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2006;55(RR-3):1. Sanford Guide, 2020.

Diagnosis of Pertussis

PCR (Polymerase Chain Reaction)

- Rapid test, excellent sensitivity, variable specificity
- Best from nasopharyngeal area within 0-3 weeks of cough, may be accurate up to 4 weeks
- Risk of false negatives increases after 4 weeks

Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP). Broder KR, Cortese MM, Iskander JK, Kretsinger K, Slade BA, Brown KH, Mijalski CM, Tiwari T, Weston EJ, Cohn AC, Srinivastava PU, Moran JS, Schwartz B, Murphy TV, Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2006;55(RR-3):1. Sanford Guide, 2020.

Diagnosis of Pertussis

Serology

- Useful for later phases of pertussis
- CDC: single point serology test optimally done 2-8 weeks after cough onset (antibody titers are highest)

Preventing tetanus, diphtheria, and pertussis among adolescents: use of tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccines recommendations of the Advisory Committee on Immunization Practices (ACIP). Broder KR, Cortese MM, Iskander JK, Kretsinger K, Slade BA, Brown KH, Mijalski CM, Tiwari T, Weston EJ, Cohn AC, Srinivastava PU, Moran JS, Schwartz B, Murphy TV, Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep. 2006;55(RR-3):1. Sanford Guide, 2020.

Treatment of Pertussis

AB within 3 weeks of symptom onset

- Persistent cough is related to local tissue **damage** from *B. pertussis* NOT ongoing infection
- Do not routinely Rx AB after three weeks of cough onset
- **EXCEPTION: Pregnant women, especially if near term, treat up to six weeks after cough onset to prevent transmission to neonate**

Centers for Disease Control and Prevention. Pertussis (Whooping Cough): Treatment. <http://www.cdc.gov/pertussis/clinical/treatment.html>

Treatment of Pertussis

Primary Regimen

- Azithromycin 500 mg PO on day 1, then 250 mg q24h days 2-5 (3-day course NOT validated, thus not recommended)
- Clarithromycin 1g ER q24h, x 7 days
- Erythro base 2g QID x 7-14 days

The Sanford Guide to Antimicrobial Therapy, 2020

Treatment of Pertussis

Alternative Regimen

- TMP-SMX-DS 1 tab PO BID x 14 days

The Sanford Guide to Antimicrobial Therapy 2020.

Community Acquired Pneumonia (CAP)

- Infection of the pulmonary parenchyma
- Acquired in the community; not in a hospital

Strategy for Outpatient Pneumonia Treatment

ATS/IDSA Clinical Guideline on Community Acquired Pneumonia, Oct 2019

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

CAP: Diagnosis

Clinical findings: Fever (80%), cough, chills, tachycardia, pleuritic chest pain

- Lack of sensitivity for clinical findings, so chest x-ray is gold standard (if infiltrate present)
- CBC: predominant leukocytes (15-30,000)

CAP: Outpatient Tx?

PSI: Community Acquired **Pneumonia Severity Index** for adults

- Gender and Age
- Comorbid illnesses
- PE findings
- Lab/Rad findings

Assigns % mortality based on total points

<http://www.mdcalc.com/psi-port-score-pneumonia-severity-index-adult-cap/>

Fine MJ, Auble TE, Yealy DM, et. al. A prediction rule to identify low-risk patients with community-acquired pneumonia. *N Engl J Med.* 1997; 336:243-250.

CAP: Outpatient Tx?

What about CURB-65?

- C= Confusion (1 point)**
- U= Urea >20 mg/dL (1 point)**
- R= Respiratory rate >30 (1 point)**
- B= Blood pressure <90/<60 (1 point)**
- 65= Age > (1 point)**

If ≥ 2 points, consider hospitalization.

<http://www.aaafp.org/fpm/2006/0400/fpm20060400p41-rt2.pdf>

Lim WS, van der Eerden MM, Laing R, et al. Defining community acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax*. 2003 May;58(5):377-82.

PSI vs CURB-65

- PSI id's >proportions of patients as low risk and has higher discriminative power in predicting mortality (compared to CURB-65)
- PSI safely increases the proportion of patients who can be treated in the outpatient setting

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

Downside to PSI

- PSI may underestimate illness severity among younger patients and oversimplify how clinicians interpret variables (Ex. BP<90 mm Hg considered abnormal, regardless of the patient's baseline and actual measurement)
- PSI should be used in conjunction with clinical judgment

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

Recommendation

PSI *plus* clinical judgement can decrease:

- Unnecessary variability in admission rates
- The high cost of inpatient pneumonia treatment
- The risk of hospital-acquired complications

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

CAP: What Bug?

- Laboratory tests to ID bugs are not recommended unless severe disease
- IDSA/ATS recommend empiric treatment for outpatients

Diagnosis and Treatment of Adults with Community-acquired Pneumonia An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America Joshua P. Metlay*, Grant W. Waterer*, Ann C. Long, Antonio Anzueto, Jan Brozek, Kristina Crothers, Laura A. Cooley, Nathan C. Dean, Michael J. Fine, Scott A. Flanders, Marie R. Griffin, Mark L. Metersky, Daniel M. Musher, Marcos I. Restrepo, and Cynthia G. Whitney; on behalf of the American Thoracic Society and Infectious Diseases Society of America

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

Pneumonia Treatment

- Choice of antimicrobial agents is based on the presence or absence of co-morbidities

“Co-Morbidities”

Chronic heart, lung, liver, or renal disease; diabetes mellitus; alcoholism; malignancy; or asplenia

Think Strep when you ID co-morbidities!!!

“Strep”

Strep pneumo
Streptococcus pneumoniae
“Pneumococcal pneumonia”

Pneumococcal Disease

- Strep pneumo resides asymptotically in healthy adults
- At age extremes (or immunocompromised individuals) it becomes pathogenic
- The capsule allows it to evade immune system

The Spleen's Role

- Spleen contains macrophages that destroy bacteria
- Encapsulated bacteria are difficult to eliminate but especially in asplenic patients
- Asplenic patients are at high risk for bacterial septicemia

Clinical Pearl:

If presence of co-morbidities, think Strept pneumo---
If Strept pneumo is suspected, neither a macrolide nor doxycycline should be prescribed. Resistance rates too high in US.

Back to Pneumonia Tx

...So, pneumonia treatment is based on presence or absence of co-morbidities

Community Acquired Pneumonia (CAP)

For healthy outpatient adults *without* comorbidities :

- **Amoxicillin 1 gram three times daily** (strong recommendation, moderate quality of evidence), **OR**
- **Doxycycline 100 mg twice daily** (conditional recommendation, low quality of evidence), **OR**
- **Macrolide** (azithromycin 500 mg on first day then 250 mg daily or clarithromycin 500 mg twice daily or clarithromycin ER 1000 mg daily) *only in areas with macrolide resistance < 25%* (conditional recommendation, moderate quality of evidence).

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

43

Quiz

How many days of treatment are usually recommended for treatment of community acquired pneumonia?

The Sanford Guide to Antimicrobial Therapy 2020

Treatment for CAP

For outpatient adults *with* comorbidities:

(chronic heart, lung, liver, or renal disease; diabetes mellitus; alcoholism; malignancy; or asplenia; risk factors for MRSA or *Pseudomonas*)

“no particular order of preference”

- **Monotherapy**
- **Combination therapy**

Risk factors include prior respiratory isolation of MRSA or *P. aeruginosa* or recent hospitalization AND receipt of parenteral antibiotics (in the last 90 d)

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

45

Treatment of CAP *with* co-morbidities

• **Monotherapy:**

Respiratory fluoroquinolone

(levofloxacin 750 mg daily, moxifloxacin 400 mg daily, or gemifloxacin 320 mg daily) (strong recommendation, moderate quality of evidence)

- Levofloxacin (Levaquin)
- Moxifloxacin (Avalox)
- Gemifloxacin (Factive)
- Belafloxacin (Baxdela)

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

46

Treatment CAP *with* co-morbidities

• **Combination therapy:**

- **Amoxicillin/clavulanate or a cephalosporin** (cefepodoxime 200 mg twice daily or cefuroxime 500 mg twice daily); **PLUS**

- **Macrolide or Doxycycline**

(Plus macrolide: strong recommendation, moderate quality of evidence for combination therapy)

(Plus doxy: conditional recommendation, low quality of evidence for combination therapy)

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

47

Why Use Broad Spectrum Agents?

- **More likely to have poor outcomes if initial regimen is inadequate**
- **Some of these patients have risk factors for resistant organisms (recent contact with healthcare system or recent antibiotic exposure)**

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

The Quinolones

CAP in an Adult
If co-morbid is present:
Respiratory quinolone

- Moxifloxacin 400 mg
- Gemifloxacin 320 mg
- Levofloxacin 750 mg
- Delafloxacin 450 mg BID

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

Respiratory Quinolones

Ciprofloxacin no longer considered a respiratory quinolone R/T increased rates of resistance:

- *S. pneumoniae*
- *Pseudomonas aeruginosa*
- *C. difficile*
- *N. gonorrhoeae*
- MRSA, MSSA
- *S. aureus*

Prescribers Letter 2019; 18(5):270501

What do gatifloxacin (Tequin), grepafloxacin (Raxar), sparfloxacin (Zagam), and trovafloxacin (Trovan) all have in common?

Hint: They all "used to be" on the market.

Remember These?

- **Gatifloxacin:** blood sugar irregularities
- **Sparfloxacin:** phototoxicity and QT prolongation
- **Trovafloxacin:** hepatotoxicity

Quinolones as a Class

- **Blood sugar level issues!**
- **QT prolongation**
- **CNS adverse effects (dizziness, etc.)**
- **Tendon rupture (rare)**

Prescribers Letter 2011; 18(5):270501

FDA Bulletin May 2016

- Safety Labeling Changes
- “serious side effects associated with FQs generally outweigh the benefits for patients with acute sinusitis, acute bronchitis, and uncomplicated UTI who have other treatment options”
- FQs should be reserved for people who have no alternative treatment options

5-12-16 FDA Bulletin; Updated 6/7/16

FDA Bulletin May 2016

What Side effects?

- Serious side effects involving the tendons, muscles, joints, nerves, and CNS
- “...stop systemic FQ treatment immediately if a patient reports serious side effects...”
- Pins, needles, tingling, prickling sensations, confusion, hallucinations

5-12-16 FDA Bulletin; Updated 6/7/16

Things to Remember!

- None approved in children*
- Do not use in pregnant patients
- Separate from Mg, Al, sucralfate, Fe, Zn (Ca probably OK but not with ciprofloxacin): drug specific
- No sig CYP450 interactions except with ciprofloxacin

Prescribers Letter 2019; 18(5):270501

Ciprofloxacin

- Ciprofloxacin is a 1A2 med
- Combined with theophylline, xanthines (CAFFEINE), results in increased plasma concentrations of the co-administered drug
- So what happens???

Prescribers Letter 2019; 18(5):270501

Respiratory Quinolones

What would make you choose one over the other?

- Moxifloxacin 400 mg
- Gemifloxacin 320 mg
- Levofloxacin 750 mg
- Delafloxacin 450 mg

Prescribers Letter 2019; 18(5):270501

Levofloxacin

- Diminished activity against *Strept pneumo* and anaerobic pathogens
- Levofloxacin originally dosed at 500 mg daily but increased to 750 mg daily to improve coverage against resistant organisms
- Moxi has better anaerobic activity

Prescribers Letter 2019; 18(5):270501
The Sanford Guide to Antimicrobial Therapy 2020

Respiratory Fluoroquinolones 3rd Generation

Levofloxacin

Gram Positives, Gram Negatives,
Atypical Pathogens, DRSP, many
aerobes, some anaerobes

Staph: MSSA
Listeria

Strept: all; M. cat, H. flu, E. coli, Legionella, Chlamydophila, Mycoplasma, Klebsiella, + Pseudomonas,

Respiratory Fluoroquinolones 4th Generation

Moxifloxacin*, Gemifloxacin, Delafloxacin

Gram Positives, Atypical Pathogens, superior
pneumococcus and anaerobic coverage

Staph: MSSA
Listeria
Not urinary
pathogens

Strept: all; M. cat, H. flu, E. coli, Legionella, Chlamydophila, Mycoplasma, Klebsiella

* GI pathogen coverage

Take Home Point

- A 4th generation quinolone is a better choice than a 3rd gen quinolone to treat DRSP

Prescribers Letter 2019; 18(5):270501

Pneumonia

2 Other Pathogens to Look out for!

Mycoplasma

AKA "Walking Pneumonia"

- Most common Atypical Pathogen
- Outbreaks occur mostly in crowded environments
- Highest rates among school aged children, military recruits, college students, nursing homes
- 1-10/50 cases (2 million cases/year)

<https://www.cdc.gov/pneumonia/atypical/mycoplasma/about/index.html>; 2021

Mycoplasma

- Smallest organism that can survive alone in nature
- Not visible on Gram stain because there is no cell wall
- Spread by respiratory droplets in Fall and winter mostly
- Not everyone who is infected, develops pneumonia

<https://www.cdc.gov/pneumonia/atypical/mycoplasma/hcp/disease-specifics.html>

FYI Mycoplasma

- Causes wheezing in patients who have asthma, incessant coughing!
- Causes wheezing in children who don't have asthma

<https://www.cdc.gov/pneumonia/atypical/mycoplasma/hcp/disease-specifics.html>

Mycoplasma: Symptoms

- **Respiratory Tract Involvement:** Intractable, cough may be productive or nonproductive, sputum discoloration late in disease, wheezing, dyspnea may occur, pharyngitis, rhinorrhea, ear pain, sinusitis

Chest auscultation may be normal!

Mycoplasma: Symptoms

Extrapulmonary Symptoms:

- **Skin rash:** maculopapular or vesicular, SJS (16% of SJS patients are positive for Mycoplasma)
- **Cardiac involvement:** most commonly reported, rhythm disturbances, HF, chest pain
- **Orthopedic:** polyarthralgia, myalgia
- **CNS:** encephalitis most common, aseptic meningitis

Mycoplasma: Diagnosis

Testing not usually performed because empiric treatment is usually successful; but for hospitalized patients:

- **PCR:** highly sensitive and specific; test of choice if available (considered gold standard for dx) Sanford Guide, 2020
- **EIA:** 97.8% sensitivity, 99.7% specificity; compare acute and convalescent phase sera 2-3 weeks apart, 4-fold increase indicates infection
- **Culture:** organism is very fastidious and may take 2-3 weeks to grow, so not very helpful

Mycoplasma: Diagnosis

Chest x-ray:

- Most common are reticulonodular and/or patchy opacities
- Thickened bronchial shadow, streaks of interstitial infiltrates, and areas of atelectasis
- Small pleural effusions

Patient ND

If Mycoplasma is documented as the pathogen, what the best treatment?

Patient ND

If *Mycoplasma* is documented as the pathogen, what **the best treatment?**

1. Azith 500 mg once, then 250 mg x 4 days
2. Azith 2g once
3. Doxy 100 mg PO BID
4. Amox-clav 875 PO mg BID

The Sanford Guide to Antimicrobial Therapy 2020

Patient ND

• Because *Mycoplasma* doesn't have a cell wall, AB that inhibit cell wall synthesis are ineffective (PCNs including amox/clav)

The Sanford Guide to Antimicrobial Therapy 2020

Patient ND

- Increasing macrolide resistance with *Mycoplasma*
- Doxy is a primary regimen
- Azithromycin, levofloxacin alternate regimens

The Sanford Guide to Antimicrobial Therapy 2020

Legionella Pneumonia

- **1976:** outbreak at the American Legion convention in Philadelphia
- Common form of pneumonia caused by *Legionella pneumophila*

Legionella Pneumonia

- **1976:** outbreak related to AC cooling system of hotel
- *Legionella* is found in fresh water
- Examples: shower heads, sinks, faucets, hot water tanks, heaters, large plumbing systems

Legionella Pneumonia

Clinical Clues (Pneumonia plus)

- Presence of GI symptoms, especially diarrhea
- Respiratory symptoms not prominent initially
- Hyponatremia
- Hepatic dysfunction
- Hematuria

Diagnosis of Legionella Pneumonia

- Culture
- Urinary antigen test (don't need a sputum sample but specific for only one serogroup-but the most common): rapid, specific
- Culture plus urine is recommended

Treatment of Legionella Pneumonia

- Levofloxacin 750 mg PO or Moxifloxacin 400 mg PO x 7-10 days
- Azithromycin is alternative treatment
- No head-to-head comparison of FQ vs macrolide

What about use of steroids in patients who have CAP?

- OUTpatients, **NOT RECOMMENDED!**

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

What about use of steroids in patients who have CAP?

- **Hospitalized patients**, mortality reduced but not statistically significant
- Significantly decreased risk of ARDS
- Decreased hospitalizations by 1 day
- Adverse events were not more common

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

What about use of cough suppressants in patients who have CAP?

- They are not part of any clinical guidelines
- They are not evidence-based
- They increase the cost of treatment!

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

Does use of bronchodilators help improve outcomes?

- Continue SABAs and LABAs in patients who take these on a daily basis, but no evidence suggests better outcomes in CAP patients who use them
- Seems prudent to use SABAs for SOB but no evidence for improved outcomes

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

Pneumococcal Disease

Simple Fact

Pneumococcal disease kills more people in the US than ALL other vaccine preventable diseases combined.

Pneumococcal Disease

- Pneumococcal disease is caused by *Streptococcus pneumoniae*

Pneumococcal Disease

- Strept pneumo resides asymptotically in healthy adults
- At age extremes (or immunocompromised individuals) it becomes pathogenic
- The capsule allows it to evade immune system

Pneumococcal Disease

- Very common!!!!
- Pneumococcal disease spread by respiratory droplet
- Pneumococcal disease causes pneumococcal pneumonia, bacteremia, meningitis
- Also causes bronchitis, rhinitis, sinusitis, OM, septic arthritis, cellulitis, pericarditis
- Pneumococcal pneumonia fatality rate is 7% but higher in elderly, co-morbid
- 25-30% of pneumococcal pneumonia patients get bacteremia

Pneumococcal Vaccine

2 types of pneumococcal vaccines available in the US

- Pneumococcal conjugate vaccine, PCV 13 (Pevnar13)
- Pneumococcal polysaccharide vaccine, PPSV23 (Pneumovax23)

PCV13 Immunization

- Stimulates mucosal antibody production, suppresses nasal carriage of *S. pneumo*
- PCV 13 stimulates antibody production to serotypes that cause about 28-42% of invasive pneumococcal disease
- **NO LONGER routine for healthy adults \geq 65 years old (Nov 2019)**
- PCV13 based on shared clinical decision-making for adults \geq 65 years who do not have an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant and have never received a dose of PCV13

PPSV 23 Immunization

- Pneumococcal polysaccharide vaccine (PPSV)
- Contains capsular polysaccharides from 23 pneumococcal serotypes
- These 23 cause about 60% of all pneumococcal infection in adults
- For adults 65 years or older who do not have an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant: one dose PPSV23 ONLY

Patient RP

38-year-old male, non-smoker, has BMI 29, has well controlled HTN, lipids was diagnosed with acute bronchitis 2 weeks ago. He reports that he is still coughing.

Does he need immunization?

Patient RP

What does CDC recommend for him?

19-64 years

- Current cigarette smokers
- Chronic lung disease (asthma, COPD)
- DM
- Alcoholism
- Chronic liver disease (including cirrhosis)
- Chronic heart disease (HF, cardiomyopathy)

What about RP's hypertension?

What about ND?

66-year-old female, ND, a *retired* school-teacher, has been diagnosed with CAP.

Suppose she has COPD and smokes 1 PPD.

CDC does not recommend additional doses of PPSV23 every 10 years after routine immunization at age 65.

[cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf](https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf)

Take Home Points

Acute bronchitis almost NEVER needs treatment with an antibiotic!

Take Home Points

Use evidence based guidelines to treat patients who have pneumonia!

Take Home Points

Don't forget to immunize "vulnerable" population against pneumonia!

Thank you!

Amelie Hollier, DNP, FNP-BC, FAANP
Advanced Practice Education Associates
amelie@apea.com
