Outpatient Diagnosis And Management Of Community-Acquired Pneumonia

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No relevant commercial relationships to disclose.

Objectives

- Identify changes in the recommendations for outpatient empiric treatment of CAP.
- Recognize the role corticosteroids play in CAP treatment in the absence of underlying chronic lung disease.
- Recall treatment recommendations in influenza-positive CAP.

Novel virus Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) will fall outside the scope of this review.

Community Acquired Pneumonia (CAP)

In the United States, Community-Acquired Pneumonia (CAP) is responsible for 5 million illnesses, 1 million hospitalizations, and 60 thousand deaths annually.[1,2]

CDC Provisional pneumonia related death counts 1/1/20-2/6/21

Deaths involving pneumonia with or without COVID-19, excluding influenza. = 389,232

Case

- Mr. Greene is a 65 year old man with a PMHx of stage 3 CKD, and uncontrolled type 2 diabetes.
- CC: cough, body aches for 5 days.

Mortality is greatest:

under 4

65+

Most Common Bacterial Pathogens

Streptococcus pneumoniae

Haemophilus influenzae,

Moraxella catarrhalis

Staphylococcus aureus

Most Common Atypical Bacterial Pathogens

Mycoplasma pneumoniae

Chlamydia pneumonia

Legionella

Multiple Choice

What percentage of CAP cases involve both bacterial and viral co-infection?

- Up to 25%
- Up to 10%
- Up to 20%
- Up to 15%

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Most Common Viral Pathogens

Influenza

Rhinovirus

Respiratory Syncytial Virus

Coronavirus

Adenovirus

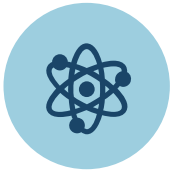
Parainfluenza

Diagnosis

Symptoms

Radiographic Confirmation

Signs



Influenza?

Mr. Greene

HPI:

- Productive cough
- Subjective fevers
- Myalgias
- Chills
- Headache

Mr. Greene

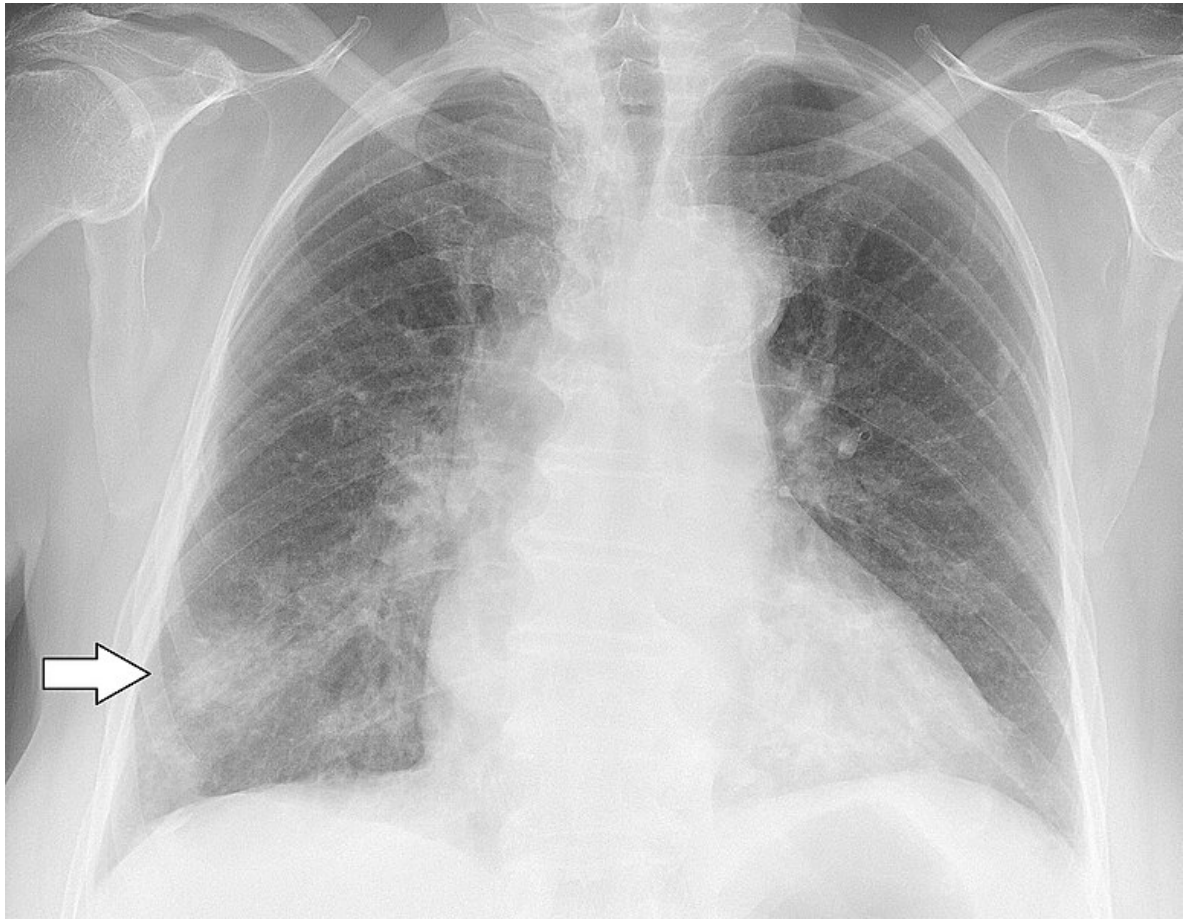
Exam

- HR 110, Sp02 92%
- T 100.0, BP 130/90
- RR 24
- Alert and oriented
- Heart: RRR no MRG
- Lung: rales lower right lung field. No Rhonchi

Mr. Greene

What studies do you order?

- Influenza NAAT
- Legionella?
- **Radiographs**
- CBC
- BMP



Mr. Greene

Lab Results

- Influenza positive

CBC:

- WBC 12,000, HCT 35%, Platelets 110,000

BMP:

- Glucose 280 mg/dL, GFR 50, BUN 25, Sodium 135. Otherwise WNL

Severe Pneumonia

Major Criteria

- Septic shock
- Respiratory failure requiring ventilation

Minor Criteria

- Multi-lobar infiltrates
- Respiratory rate ≥30
- Confusion
- Hypothermia
- Hypotension
- PaO2/FiO2 ratio ≤ 250
- Uremia - BUN ≥ 20 mg/dl
- Leukopenia - white blood cell count < 4,000 cells/µl
- Thrombocytopenia- platelet count < 100,000/µl

Risk Stratification Tools

CURB-65

- Requires labs

PSI/PORT

- Better predictor of mortality
- Requires labs
- Recommended by IDSA/ATS

Risk Stratification Tools

CURB-65

- Confusion
- BUN > 19 mg/dL (> 7 mmol/L)
- Respiratory Rate ≥ 30
- Systolic BP < 90 mmHg or Diastolic BP ≤ 60 mmHg
- Age ≥ 65

Risk Stratification Tools

PSI/PORT

- **Age**
- **Male** / Female
- Nursing home resident
- Neoplastic disease
- Liver disease history
- CHF history
- Cerebrovascular disease history
- **Renal disease history**
- Altered mental status
- Respiratory rate ≥30 breaths/min
- Systolic blood pressure <90 mmHg
- Temperature <35°C (95°F) or >39.9°C (103.8°F)
- Pulse ≥125 beats/min
- Partial pressure of oxygen <60 mmHg or <8 kPa (<91% SpO2)
- Pleural effusion on x-ray

Risk Stratification Tools

PSI/PORT

- pH <7.35
- BUN ≥30 mg/dL or ≥11 mmol/L
- Sodium <130 mmol/L
- **Glucose ≥250 mg/dL or ≥14** mmol/L
- Hematocrit <30%

Mr. Greene

CURB 65 = 2
PSI/PORT score = 85
Risk Class III, 0.9-2.8% mortality. Outpatient or inpatient treatment, depending on clinical judgment.

Good social support at home.

Treatment

Updates in treatment recommendations for CAP

Is there a role for procalcitonin?

- Higher levels of procalcitonin do appear to correlate with a bacterial infection.
- Researchers have been unable to define a lower threshold of procalcitonin levels which is sensitive for an isolated viral infection.
- In clinically confirmed cases of CAP, procalcitonin should not be used to guide **initial** therapy.

Macrolide Resistance

Streptococcus pneumoniae

- most commonly isolated bacteria in CAP
- S. pneumoniae macrolide resistance levels in the United States can exceed 30%.

Treatment

- HCAP category is eliminated.
- Based on severity of illness – remember the PSI/PORT score and major/ minor criteria.
- Severe illness should be treated in the inpatient setting
- Outpatient empiric therapy now guided by presence or absence of comorbidities.

Healthy Populations

- Amoxicillin 1 gram three times daily

  OR

- Doxycycline 100 mg twice daily

Individuals with comorbidities

- Chronic heart, lung, liver, or renal disease
- Diabetes mellitus
- Alcoholism
- Malignancy
- Asplenia

Individuals with comorbidities

Dual therapy

- Amoxicillin/clavulanate or cefpodoxime or cefuroxime

AND

- Macrolide (azithromycin or clarithromycin) or doxycycline

Individuals with comorbidities

Monotherapy

- Respiratory fluoroquinolone (levofloxacin, moxifloxacin, or gemifloxacin
- Easier regimen
- Risks (tendon rupture, QT prolongation, and psychiatric adverse effects)

Table 1. Empiric Treatment of Community Acquired Pneumonia[5]	
Without comorbidities	Amoxicillin 1 g three times daily **or** Doxycycline 100 mg twice daily **or** Macrolide (if local pneumococcal resistance is <25%) Most communities in the US exceed 25% resistance
With comorbidities	**Combination therapy** amoxicillin/clavulanate 875 mg/125 mg twice daily* **or** Cephalosporin (cefpodoxime 200 mg twice daily OR cefuroxime 500 mg twice daily) **and** Macrolide (azithromycin 500 mg on first day then 250 mg daily, or clarithromycin 500 mg twice daily, or clarithromycin ER 1,000 mg daily) **or** doxycycline 100 mg twice daily.
OR	**Monotherapy** Fluoroquinolone (levofloxacin 750 mg daily, moxifloxacin 400 mg daily, or Gemifloxacin 320 mg daily.)
*Alternatively, Amoxicillin/clavulanate 500 mg/125 mg three times daily or 2,000 mg/125 mg twice daily	

Duration of therapy

- **Minimum** of 5 days
- Guided by an individual's return to clinical stability
- Normalization of vital signs, mental status, and the ability to eat. **PLUS 5 additional days**

True or False

All cases of radiographically proven CAP with a positive influenza test should be treated with antiviral therapy regardless of the duration of illness?

True

All cases of radiographically proven CAP with a positive influenza test should be treated with neuraminidase inhibitors regardless of the duration of illness.

True or False

Up to 30% of deaths from influenza are due to bacterial co-infection?

True

Up to 30% of deaths from influenza are due to bacterial co-infection.

The early initiation of empiric antibiotic therapy reduces mortality!

Influenza

Treat influenza positive cases of radiographically confirmed CAP with BOTH an antiviral and antibiotic.

CORTICOSTEROIDS

- In an individual without underlying lung disease, the IDSA places a strong recommendation against the use of corticosteroids in non-severe CAP.
- Use as appropriate for COPD/ Asthma.
- In influenza positive cases of CAP, the use of corticosteroids may be associated with increased mortality.

Mr. Greene

Treatment:

- 5 days of oseltamivir
- Amoxicillin-clavulanate 875/125 BID
- Doxycycline 100 mg BID

Duration

- 6 days total minimum

Vaccine Updates

- AICP recommends all adults 65 or older receive one dose of PPSV**23**, and the PCV**13** vaccination is **no longer routinely recommended for all adults ≥65.**
- The choice to vaccinate adults greater than age 65 with PCV13 should be made using “shared clinical decision-making for adults aged ≥65 years who do not have an immunocompromising condition, cerebrospinal fluid (CSF) leak, or cochlear implant, and who have not previously received PCV13.”19

PCV-13

No longer routinely recommended for adults 65 years old and up.

- Widespread pediatric vaccination led to decline in CAP due to these strains.
- Immunocompromising condition, cerebrospinal fluid (CSF) leak, or cochlear implant.
- Otherwise, shared decision making.

Take Away Points

- All suspected CAP should be confirmed with radiographs.
- Macrolide monotherapy not recommended due to resistance levels in US.
- Influenza + CAP should be treated with antiviral and antibiotic therapy.
- Corticosteroids are not recommending in non severe CAP unless there is underlying steroid responsive lung disease.

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- See if you can get DOI instead

Thanks

Do you have any questions?

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