DRIVING CHANGE 2023
THE URGENT CARE CONVENTION

Diagnosis and Treatment of Community Acquired Pneumonia:

an Evidence Based Approach

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Metlay JP, Waterer GW, et. al. 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. *American Journal of Respiratory and Critical Care Medicine*, Volume 200, Issue 7, 1 October 2019

Our Purpose Today:

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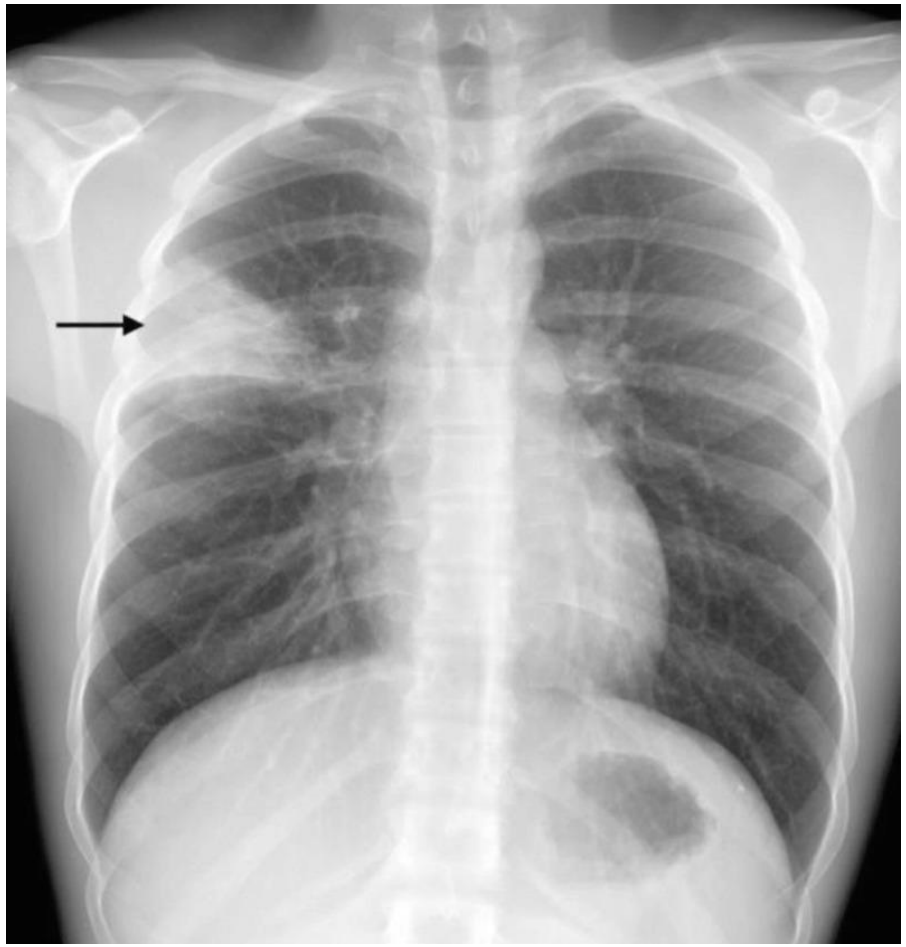
- Identify and risk stratify UC patients with CAP
- Order appropriate testing
- Prescribe the safest, most effective treatment
- Yay or nay adjunctive treatments for CAP based on evidence



Case 1

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A 28 year-old female without significant PMH present to the UCC with 2 days of fever, cough with sputum, and feeling over all poorly.

- Rhonchi in right mid-lung zone
- Heart rate of 120, regular, temp of 39.2C, normal blood pressure, respiratory rate of 22 per minute, and oxygen 94% on room air
- X-ray shows right middle lobe infiltrate
- The patient is clearly symptomatic with mild dyspnea and looks ill
- Disposition?

Case 2

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An 85-year-old nursing home patient with mild COPD has 3 days of mild cough productive of yellow sputum

- No fever, child, shortness of breath, or orthopnea
- Vital signs are normal
- X-ray with right sided infiltrate
- Daughter is concerned that patient needs to be admitted
- Patient wishes to return home
- Disposition?

Case 3

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A 55 year-old man with DM, CKD, and 3 days of non-productive cough, fever, and altered mental status

The patient is in moderate distress, using accessory muscles, sitting upright, and has rhonchi and rales in all lung fields.

Febrile, HR 130, blood pressure 88/50, RR 26 with room air oxygen saturation 88%

Xray shows bilateral infiltrates concerning for multifocal pneumonia and left sided pleural effusion

You suggest he goes to the ER by EMS but he says he has to go home and feed his dog first, and he will go to the ER tomorrow…

Definitions

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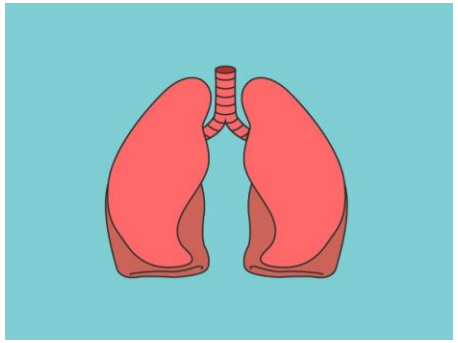
- Community acquired pneumonia (CAP)
- Acute infection of the lung parenchyma
- Patients have not been hospitalized within 48 hours
- Are not on a ventilator
- Term “healthcare-associated pneumonia,” which implies increased risk for drug resistant organisms due to dialysis, nursing home, outpatient day facilities, or hospitalization in last 3 months no longer used. The risk is minimal.



Evidence Based Review

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- PubMed search, CAP, cough, related terms relevant to EM, UC, ambulatory care
- Guidelines reviewed
  - IDSA/ATS
  - ACEP
  - AAFP
  - ACP

A Word about COVID-19…

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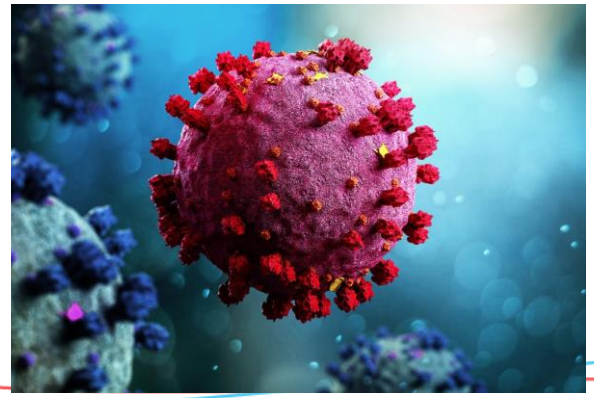
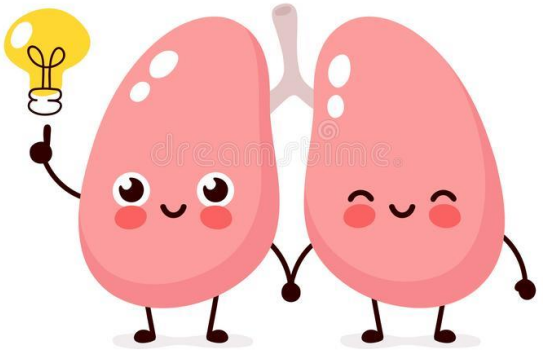
- Prior to 2020, not much discussion about viral pneumonia
  - Limited morbidity
- COVID-19 must be considered in all patients with pneumonia
- No history or physical findings reliably distinguish bacterial from COVID-19 pneumonia
- Strongly consider antibiotics for secondary bacterial infection in all patients with pneumonia from COVID-19
- Should rule-out COVID-19 in all cases of CAP



Epidemiology

- Number 1 in infectious disease related death
- Number 8 in all-cause mortality
- *S. pneumonia* most commonly isolated pathogen, recently limited by pneumococcal vaccine
- Less common:
  - *H. influenzae*
  - *P. aeruginosa*
  - *M catarrhalis*
  - Atypicals such as *Mycoplasma* and *Chlamydophila*



Epidemiology

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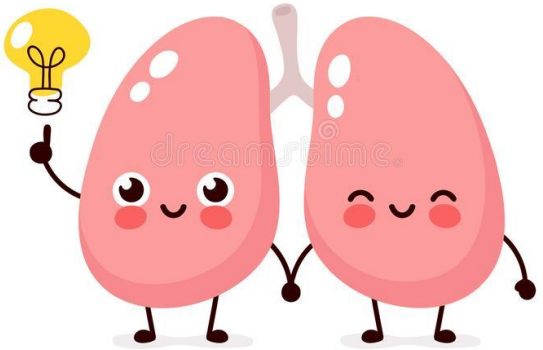
- Non-COVID viral
  - Influenza
  - Parainfluenza
  - RSV
- 20% all pneumonias
- Seasonal
- Etiology never determined up to 50%



Pathophysiology

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- Pathogens from upper respiratory tract aspirated into the lower respiratory tract
- Pathogens in the lung parenchyma produce intra-alveolar exudates
- Host defenses overwhelmed by virulence or inoculum size
- Results in a wide-spectrum of severity due to individual inflammatory response
- Those at highest risk:
  - COPD or other chronic lung disease
  - Elderly
  - Smoking
  - immunocompromised

Differential Diagnosis CAP

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Low Risk:

- Bronchitis
- URI
- Asthma exacerbation

High Risk:

- CHF
- ACS
- PE
- Neoplastic lesions
- Pulmonary abscess/empyema

RAPID ASSESSMENT

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- ALL PATIENTS WITH SEVERE SYMPTOMS
  - Shortness of breath
  - Tachypnea
  - High fever
  - Chest pain

- Assess for hypoxemia and hypotension
- Consider possibility of COVID-19 and use PPE for all staff accordingly
- Assess for sepsis and if present, activate EMS accordingly

Assessment

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- Thorough history and physical aimed at ruling out other disease processes
- Fever, hypoxia, tachycardia, and crackles on auscultation suggestive of CAP
- History does not reliably confirm or rule-out possibility of CAP
- 80-90% will have cough
- 70% SOB
- Sputum 50%
- Pleuritic CP 50%

Assessment

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Constellation of symptoms more helpful than individual symptoms

Limited diagnostic accuracy of auscultation

Symptoms less reliable in elderly and immunosuppressed

Crackles and decreased breath sounds low predictive value

Egophony and dullness to percussion higher predictive value

Chest X-ray

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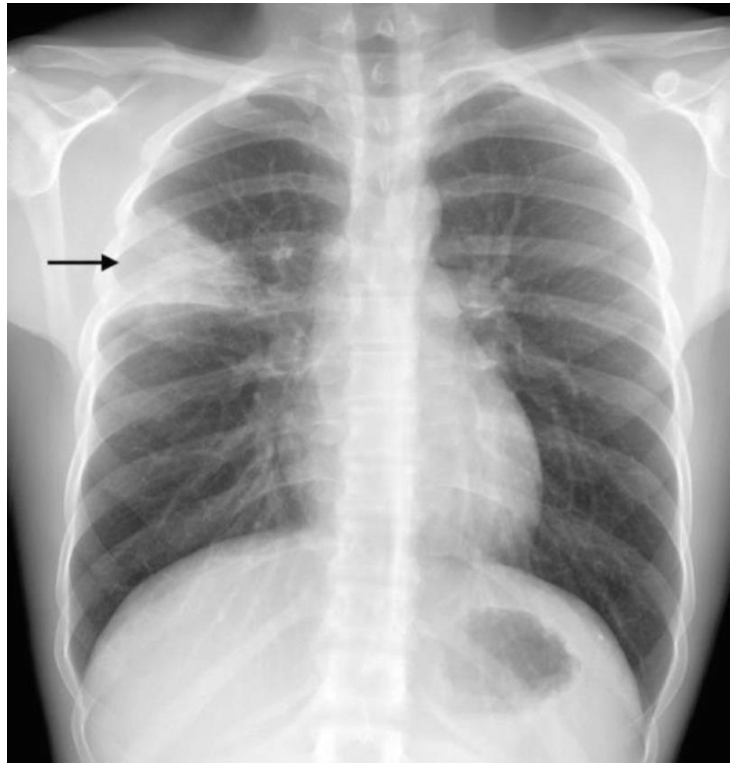
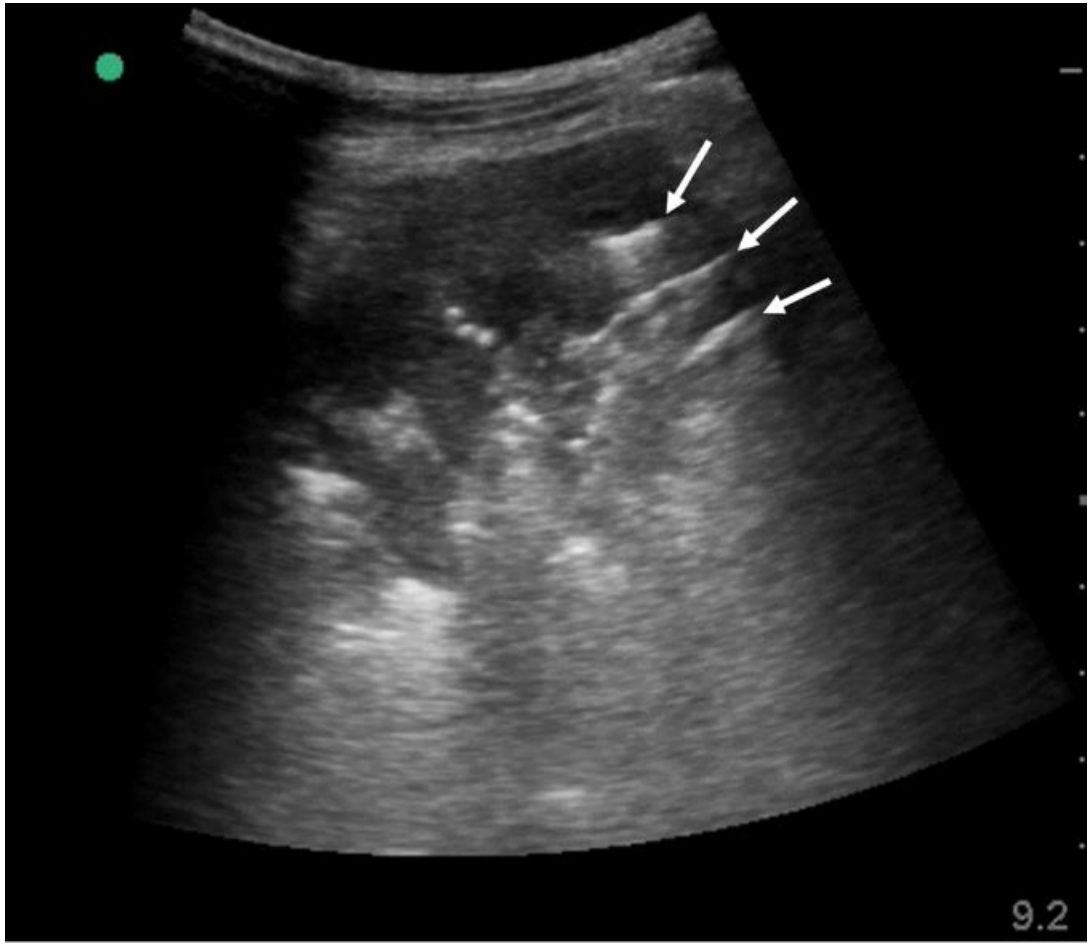
- Hallmark for diagnosis despite low sensitivity for detection
  - Specificity 93%
  - Sensitivity 46-77%
- It is a tool should be used to assist with but not necessarily exclude CAP
- Useful to rule out other conditions



CT Scan

- Sensitivity approaching 100%
- Increased radiation and cost is prohibitive
- Not readily available in UCC
- Consider if high index of suspicion, multiple comorbid conditions or other complicating factors and diagnosis is in question
- Undifferentiated sepsis
- Do not withhold emergency department treatment for outpatient CT scan in those patients who meet sepsis criteria

Ultrasound



- POCUS available in some UCC
- Useful for diagnosis of pneumonia
- Sensitivity 94% and specificity 96% in experienced hands

Laboratory Testing

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- CBC and ESR of little utility individually
- Biomarkers such as CRP and PCT limited use in UCC due to turn around time
- Trending results more useful than individual results
- IDSA/ATS, treat for CAP if clinical suspicion exists regardless of CRP, PCT
- *M. pneumoniae* testing not recommended, little value, benign disease course

Laboratory Testing

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- Urine antigen testing
  - *S. pneumoniae*
  - *L. pneumophila*
- Testing does not improve outcome or decrease cost
- Testing not recommended unless recent outbreak, high clinical suspicion

Laboratory testing

Blood cultures not recommended for outpatients, do not alter course or change management

Sputum cultures not recommended for outpatients, difficult to obtain, rarely alter course and do not change management

Viral multiplex panel accurate, usefulness unproven, very expensive

Influenza testing in high-risk patients when influenza in season

COVID Testing

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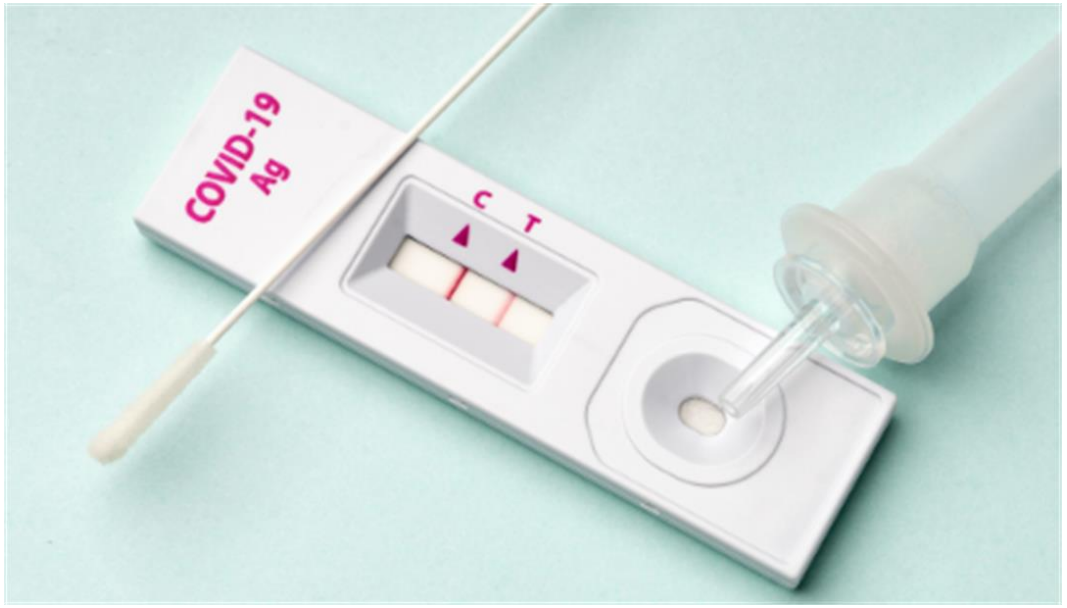
- All patients with pneumonia either clinically or with x-ray findings
- Negative does not rule-out COVID
- Positive COVID does not rule-out bacterial pneumonia



Disposition: you have only 2 choices

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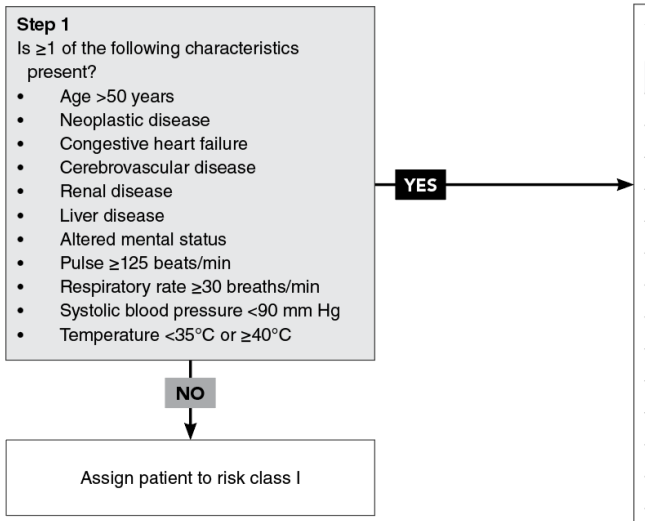
Outpatient treatment

ED referral/admission

Pneumonia Severity Index (PSI)



Step 2: Assign patient to risk class II-V based on points assigned

Finding	Points
Age	
• Men	Age (yr)
• Women	Age (yr)-10
Nursing Home Resident	10
Coexisting Illness	
• Neoplastic disease	30
• Liver disease	20
• Congestive heart failure	10
• Cerebrovascular disease	10
• Renal disease	10
Physical Examination Findings	
• Altered mental status	20
• Respiratory rate ≥30 breaths/min	20
• Systolic blood pressure <90 mm Hg	20
• Temperature <35°C or ≥40°C	15
• Pulse ≥125 beats/min	10
Laboratory and Radiographic Findings	
• Arterial pH <7.35	30
• BUN ≥30 mg/dL (11 mmol/L)	20
• Sodium <130 mmol/L	20
• Glucose ≥250 mg/dL (14 mmol/L)	10
• Hematocrit <30%	10
PaO_2 <60 mm Hg or oxygen saturation <90% on pulse oximetry	10
Pleural effusion	10
Total	_____

Score/Class	Risk	Disposition
≤70, class II	Low	Outpatient care
71-90, class III	Low	Outpatient versus observation admission
91-130, class IV	Moderate	Inpatient admission
>130, class V	High	Inpatient admission

Abbreviations: BUN, blood urea nitrogen; PaO_2, partial pressure of oxygen, arterial.

CURB-65

Symptom	Points
Confusion	1
Urea: BUN >19 mg/dL (>7 mmol/L)	1
Respiratory rate ≥ 30 breaths/min	1
Systolic BP <90 mm Hg or diastolic BP ≤ 60 mm Hg	1
Age ≥ 65 years	1
Total	_____

Score	Risk	Disposition
0 or 1	1.5% mortality	Outpatient care
2	9.2% mortality	Inpatient versus observation admission
≥3	22% mortality	Inpatient admission; consider ICU admission with score of 4 or 5

Abbreviations: BP, blood pressure; BUN, blood urea nitrogen; ICU, intensive care unit.

CRB-65

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TABLE 1

CRB-65 Rule to Predict Mortality in Patients with Community-Acquired Pneumonia

Step 1: Calculate the score (range 0 to 4 points)

Sign or symptom	Points
Confusion (new onset with this illness)	1
Respiratory rate ≥ 30 breaths per minute	1
Blood pressure < 90 mm Hg systolic or ≤ 60 mm Hg diastolic	1
65 years or older	1
Total:	_____

Step 2: Apply the score to a patient with community-acquired pneumonia

Risk group (points)	Likelihood ratio for mortality	Mortality rate (%)*	Clinical recommendation
Low (0)	0.13	0.5	Outpatient treatment unless otherwise contraindicated
Moderate (1 or 2)	1.3	5.1	Hospitalize in most cases
High (3 or 4)	5.6	18.9	Hospitalize, and consider intensive care unit

*—Assuming an overall mortality rate of 4%.

Information from references 5-7.

Outpatient Treatment

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- Overall quality of evidence determining ideal outpatient antibiotic is poor
- Increasing rates of macrolide resistance, > 30% in US
- Monotherapy with macrolide antibiotic poor choice in US and Canada
- Amoxicillin from small studies
- Amoxicillin undertreats atypicals
- Doxycycline, efficacy theoretical

Outpatient Treatment

First Line, healthy adults, no risk for drug resistant organisms:

Amoxicillin 1 g oral 3 times per day

Or

Doxycycline 100 mg orally 2 times per day

Outpatient Treatment

Patients with Co-morbidities: Combination Therapy:

Amox/clav 500/125 3 times daily

Amox/clav 875/125 2 times daily

Amox/clav 2000/125 2 times daily

Or

Cefpodoxime 200mg 2 times daily

Cefuroxime 500 mg 2 times daily

PLUS

A macrolide (Azithromycin or Clarithromycin) or Doxycycline 100 mg 2 times daily

Outpatient Treatment

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Patients with Co-Morbidities: Monotherapy:

Levofloxacin 750 mg daily

Moxifloxacin 400 mg daily

Gemifloxacin 320 mg daily

Duration of Treatment

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Recent studies have shown abbreviated courses of antibiotics are safe, and effective

Patients who take < 6 days of antibiotics have fewer adverse effects and lower mortality

Minimum of 5 days are recommended

Reassess patient at Day 5. If improved, may stop antibiotics, if not improved or worse, consider alternate diagnosis, and change in antibiotic.

Adjunct Treatment

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No statistically significant improvement in cough when the following were studied:

- DM
- Opioids including codeine, hydrocodone
- Benzonatate
- Inhaled bronchodilators
- Inhaled corticosteroids
- Reassure patients cough will resolve when pneumonia resolves

Steroids

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- Should only be used in pneumonia with refractory septic shock
- Should not routinely be used in uncomplicated outpatient pneumonia
- Increased rates of secondary infection
- Hyperglycemia
- Asthma/COPD

Influenza Pneumonia

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- ATS/IDSA recommends oseltamivir in all patients who have pneumonia and a positive influenza test regardless of length of illness
- Patients with high-risk influenza (exposure, high incidence in community, risk factors severe disease) should be treated with oseltamivir regardless of length of illness.
- Support for these recommendations is lacking
- Consider risk/benefit each patient when prescribing

Case 1

A 28 y.o. female without significant PMH present to the UCC with 2 days of fever, cough with sputum, and feeling over all poorly.

- Rhonchi in right mid-lung zone
- Heart rate of 120, regular, temp of 39.2C, normal blood pressure, respiratory rate of 22 per minute, and oxygen 94% on room air
- X-ray shows right middle lobe infiltrate
- The patient is clearly symptomatic with mild dyspnea and looks ill
- Disposition?

Case 1

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CRB-65 score 0

↓

Treat with high dose amoxicillin for 5 days

↓

The patient returns to the urgent care on day 5 and is improved and nearly asymptomatic

↓

No further treatment recommended

Case 2

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An 85 y.o. nursing home patient with mild COPD has 3 days of mild cough productive of yellow sputum

- No fever, child, shortness of breath, or orthopnea
- Vital signs are normal
- X-ray with right sided infiltrate
- Daughter is concerned that patient needs to be admitted
- Patient wishes to return home
- Disposition?

Case 2

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CRB-65 score is 1

Although this would point to hospitalization, you use your clinical judgement to determine that outpatient treatment may be reasonable

Discuss risks and benefits of inpatient care

Patient stated clearly she understood and wanted to go back to assisted living

Given COPD history, treated with amox/clav and azithromycin

She had an uneventful recovery

Case 3

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A 55 y.o. man with DM, CKD, and 3 days of non-productive cough, fever, and altered mental status

- The patient is in moderate distress, using accessory muscles, sitting upright, and has rhonchi and rales in all lung fields.
- Febrile, HR 130, blood pressure 88/50, RR 26 with room air oxygen saturation 88%
- Xray shows bilateral infiltrates concerning for multifocal pneumonia and left sided pleural effusion
- You suggest he goes to the ER by EMS but he says he has to go home and feed his dog first, and he will go to the ER tomorrow…

Case 3

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You determined that the patient had a high likelihood of sepsis

Despite his initial objections, you pointed out his risk of complications including death, and convinced him that he needed to go to the nearest hospital by ambulance

He was admitted to the ICU where he was diagnosed with COVID-19 pneumonia.

He was treated with the latest COVID-19 treatment, broad spectrum antibiotics, and supportive care.

He did well and was transferred to a rehab facility after a 7-day hospital stay

Pearls and Pitfalls

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"I thought the hypoxia and tachycardia was due to pneumonia."

Be sure you are making the right diagnosis; not all infiltrates are pneumonia, if the history doesn't fit, i.e., fever, chills, cough absent, look for other causes such as PE, CHF, CAD, etc.

Pearls and Pitfalls

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"The patient had nasal congestion and cough for 3 days, I was concerned so I gave them antibiotics."

Don't treat URI's "just in case" the patient has pneumonia. Healthy patients with URI's have a high rate of viral pathogens. Antibiotics should only be prescribed if there is a high clinical suspicion of pneumonia

Pearls and Pitfalls

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"Can I really send a 75-year-old home with pneumonia?"

Consider the influence of age and other factors when determining disposition. Do not over or under-estimate the patient's risk of adverse events.

Pearls and Pitfalls

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"I just gave him and IV/IM dose of antibiotics to get him started".

There is no data to suggest that patients need parenteral medications prior to oral antibiotic treatment if they can tolerate oral medication. IM injections carry risk of infections, abscess, necrosis, allergy and increase cost.

Pearls and Pitfalls

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"I just use levofloxacin for everyone. Is it really that bad?"

Fluoroquinolones have several FDA black box warnings including tendon rupture, neuropathy, and aortic aneurysm/dissection and should be used with caution

Pearls and Pitfalls

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"I was sure she had pneumonia, but the x-ray was negative."

Remember x-ray does not rule out pneumonia. Consider empiric treatment, or CT scanning

Pearls and Pitfalls

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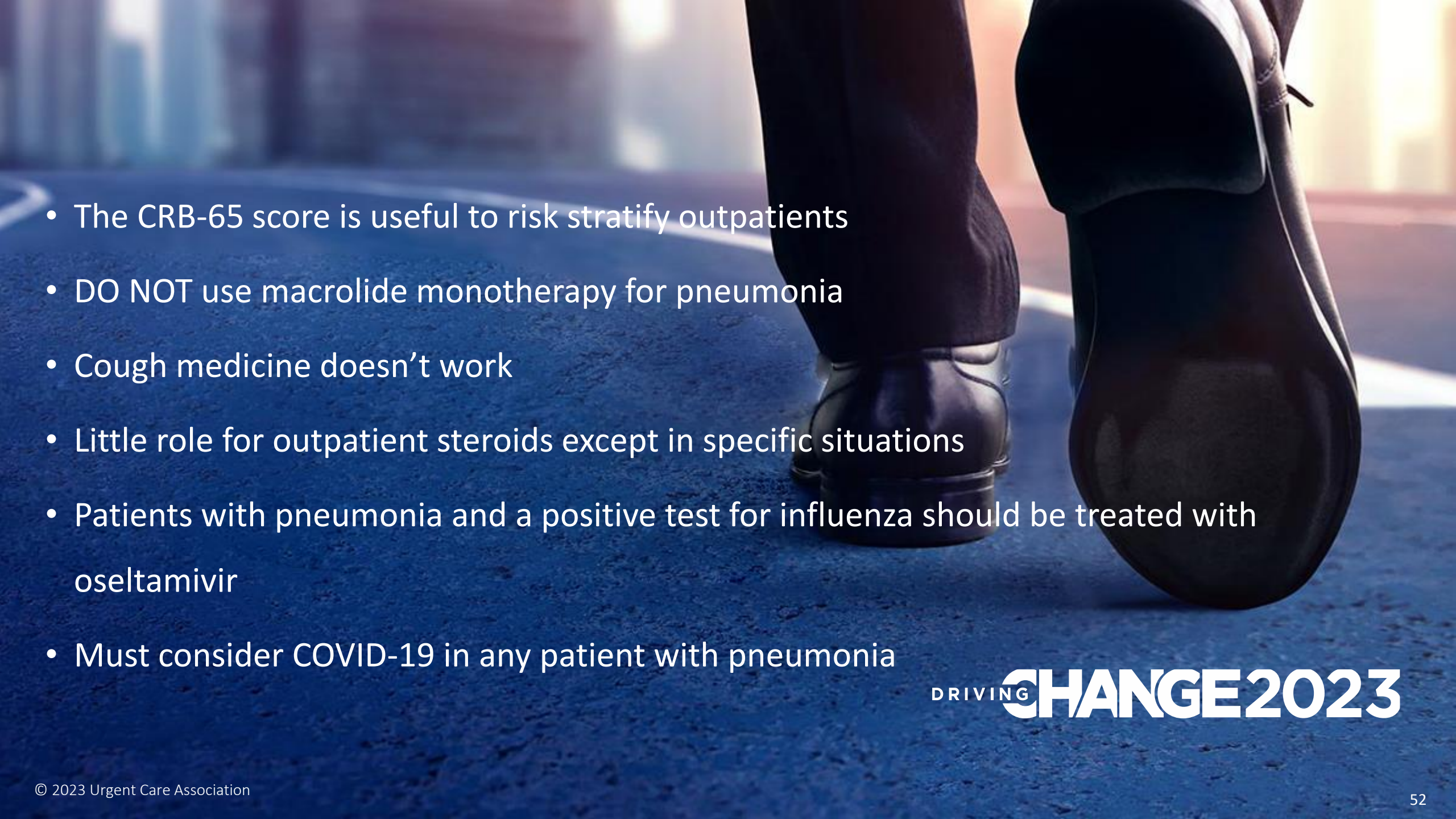
"The rapid COVID-19 test was positive and the CXR was positive for pneumonia. I assumed the pneumonia was from COVID-19."

To date there is no way to differentiate co-infection with COVID-19 and other bacterial pathogens. For this reason, in most cases it is recommended that bacterial co-infection is assumed, and the patient treated with antibiotics accordingly.



- The CRB-65 score is useful to risk stratify outpatients
- DO NOT use macrolide monotherapy for pneumonia
- Cough medicine doesn’t work
- Little role for outpatient steroids except in specific situations
- Patients with pneumonia and a positive test for influenza should be treated with oseltamivir
- Must consider COVID-19 in any patient with pneumonia

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Session Evaluation

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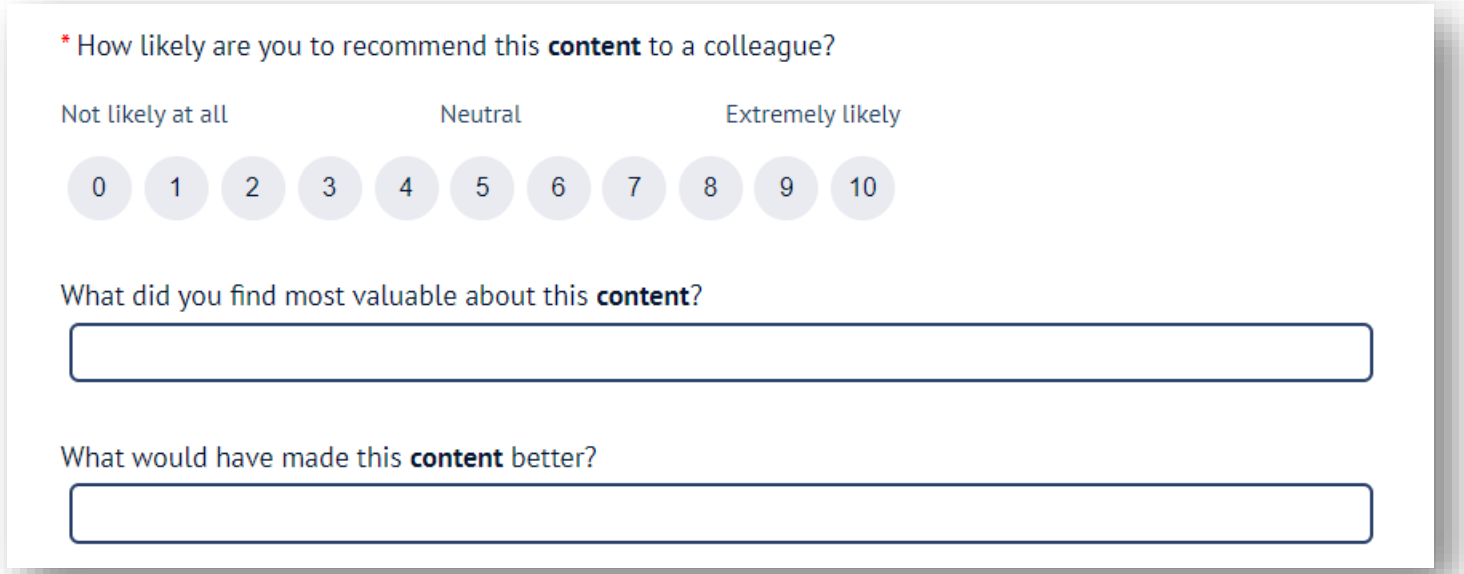
- Your feedback is valuable, take a moment to complete the survey for this session.
- To claim CME, you must complete a separate survey available after the convention.



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