



**THIS IS WHY**  
with *Dr. Busti*

## COMMUNITY-ACQUIRED PNEUMONIA COMMON PATHOGENS

### OUTPATIENT

### INPATIENT (Non-ICU)

### INPATIENT (ICU)

#### Bacteria

Chlamydophila (C.) pneumoniae  
Haemophilus (H.) influenzae  
Mycoplasma (M.) pneumoniae  
Streptococcus (S.) pneumoniae

C. pneumoniae  
H. influenzae  
M. pneumoniae  
S. pneumoniae  
Legionella species

Gram-negative bacilli  
H. influenzae  
Legionella species  
Staphylococcus aureus  
S. pneumoniae

#### Viruses

Respiratory viruses

Respiratory viruses

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## COMMUNITY ACQUIRED PNEUMONIA

### CONDITIONS ASSOCIATED WITH SPECIFIC PATHOGENS

CONDITION / DISEASE	Specific Pathogens of Concern
Alcoholism	<i>S. pneumoniae</i> , oral anaerobes, <i>Klebsiella pneumoniae</i>
COPD/Smoking	<i>H. influenzae</i> , <i>Legionella</i> spp, <i>S. pneumoniae</i> , <i>C. pneumoniae</i>
Hotel/Cruise ship (within previous 2 weeks)	<i>Legionella</i> spp.
Cough/whoop >2 weeks or posttussive vomiting	<i>Bordetella pertussis</i>
Active Influenza	Influenza, <i>S. pneumoniae</i> , <i>S. aureus</i> , <i>H. influenzae</i>
Poor dental hygiene	Anaerobes ( <i>Peptostreptococcus</i> , <i>Fusobacteria</i> , <i>Bacteroides</i> , <i>Peptococcus</i> )

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PORT PREDICTION RULE or PSI (PNEUMONIA SEVERITY INDEX)		
CATEGORY	PATIENT CHARACTERISTIC	POINTS
Demographic	Age (Male)	Years of age
	Age (Female)	Years of age minus 10
	Nursing Home Resident	+10
Comorbid Illness	Neoplastic Disease	+30
	Liver Disease	+20
	Heart Failure	+10
	Cerebrovascular Disease	+10
	Renal Disease	+10
Physical Exam Findings	Altered Mental Status	+20
	Respiratory Rate > 30 breaths/min	+20
	Systolic BP < 90 mmHg	+20
	Temperature < 35 or > 40° C	+15
	Pulse > 125 beats/min	+10
Laboratory or Radiographic Finding	Arterial pH < 7.35	+30
	Blood urea nitrogen > 30 mg/dL	+20
	Sodium < 130 mEq/L	+20
	Glucose > 250 mg/dL	+10
	Hematocrit < 30%	+10
	Arterial partial pressure of O <sub>2</sub> < 60 mmHg	+10
	Pleural effusion	+10
PSI SCORING CLASSIFICATION		
RISK CLASS	TOTAL POINTS	DISPOSITION
Risk Class I or II Note: Class I has no predictors.	≤ 70	Outpatient
Risk Class III	71-90	Short inpatient stay, or Outpatient with observation
Risk IV or V	≥ 91 points	Inpatient

## CURB-65

CHARACTERISTICS	POINTS
Confusion	+1
Uremia (BUN > 20 mg/dL)	+1
Respiratory Rate ( $\geq 30$ breaths/min)	+1
Low BP (SBP $\leq 90$ mmHg; DBP $\leq 60$ mmHg)	+1
Age $\geq 65$ years old	+1
CURB-65 RISK CLASSIFICATION	
CURB-65 TOTAL	RECOMMENDATION
0 to 1	Low risk, consider outpatient treatment
2	Short inpatient hospitalization or supervised outpatient treatment
3 to 5	Severe pneumonia, hospitalize and consider ICU admission

## SEVERITY OF COMMUNITY-ACQUIRED PNEUMONIA

CLASSIFICATION	CRITERIA
Major Criteria	<ul style="list-style-type: none"><li>▪ Septic shock with need for vasopressors</li><li>▪ Respiratory failure requiring mechanical ventilation</li></ul>
Minor Criteria	<ul style="list-style-type: none"><li>▪ Respiratory rate <math>\geq 30</math> breaths/min</li><li>▪ <math>\text{PaO}_2/\text{FiO}_2</math> ratio <math>\leq 250</math> mmHg</li><li>▪ Multilobar infiltrates</li><li>▪ Confusion/disorientation</li><li>▪ Uremia (BUN <math>\geq 20</math> mg/dL)</li><li>▪ Leukopenia (WBC <math>&lt; 4000</math> cells/mm<sup>3</sup>)</li><li>▪ Thrombocytopenia (PLT <math>&lt; 100,000</math>/mm<sup>3</sup>)</li><li>▪ Hypothermia (Tmax <math>&lt; 36^\circ\text{C}</math>)</li><li>▪ Hypotension (requiring aggressive fluid resuscitation)</li></ul>



## COMMUNITY ACQUIRED PNEUMONIA (CAP) OUTPATIENT TREATMENT RECOMMENDATIONS

CLINICAL SCENARIO	TREATMENTS (Assume normal renal/hepatic function)
Outpatients with NO Comorbidities or Risk Factors for MRSA or P. aeruginosa	Amoxicillin 1000 mg 3 times daily Doxycycline 100 mg twice daily Macrolide <ul style="list-style-type: none"><li>– Azithromycin 500 mg x 1, then 250 mg daily x 4 days</li><li>– Clarithromycin 500 mg twice daily</li><li>– Clarithromycin ER 1000 mg daily</li></ul>

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## COMMUNITY ACQUIRED PNEUMONIA (CAP) OUTPATIENT TREATMENT RECOMMENDATIONS

CLINICAL SCENARIO	TREATMENTS (Assume normal renal/hepatic function)
<b>Outpatients WITH any 1 or more Comorbidities:</b> <ul style="list-style-type: none"><li>- Chronic heart</li><li>- Lung disorders</li><li>- Liver disorders</li><li>- Renal disease</li><li>- Diabetes mellitus</li><li>- Alcoholism</li><li>- Malignancy</li><li>- Asplenia</li></ul>	<b>Amoxicillin/clavulanate (or) Cephalosporin PLUS Macrolide (or) Doxycycline</b> <ul style="list-style-type: none"><li>- Amoxicillin clavulanate or cephalosporin<ul style="list-style-type: none"><li>- Amoxicillin clavulanate<ul style="list-style-type: none"><li>- 500/125 mg 3 times daily</li><li>- 875/125 mg twice daily</li><li>- 2000/125 mg twice daily</li></ul></li><li>- Cephalosporin<ul style="list-style-type: none"><li>- Cefpodoxime 200 mg twice daily</li><li>- Cefuroxime 500 mg twice daily</li></ul></li></ul></li><li>- Macrolide (same as outpatient without comorbidities)</li><li>- Doxycycline (same as outpatient without comorbidities)</li></ul> <b>Respiratory Fluoroquinolone</b> <ul style="list-style-type: none"><li>- Levofloxacin 750 mg daily</li><li>- Moxifloxacin 400 mg daily</li><li>- Gemifloxacin 320 mg daily</li></ul>

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## COMMUNITY ACQUIRED PNEUMONIA (CAP) INPATIENT (NONSEVERE) TREATMENT RECOMMENDATIONS

CLINICAL SCENARIO	TREATMENTS (Assume normal renal/hepatic function)
Nonsevere Inpatient Pneumonia WITHOUT Risk Factors for: <ul style="list-style-type: none"><li>- MRSA (or)</li><li>- P. aeruginosa</li></ul>	<b>Beta-lactam PLUS macrolide</b> <ul style="list-style-type: none"><li>- Beta-lactam<ul style="list-style-type: none"><li>- Ampicillin-sulbactam 1.5 – 3 gm every 6 hours</li><li>- Cefotaxime 1 – 2 gm every 8 hours</li><li>- Ceftriaxone 1 – 2 gm daily</li><li>- Ceftaroline 600 mg every 12 hours</li></ul></li><li>- Macrolide<ul style="list-style-type: none"><li>- Azithromycin 500 mg daily</li><li>- Clarithromycin 500 mg twice daily</li></ul></li></ul> <b>Respiratory Fluoroquinolone</b> <ul style="list-style-type: none"><li>- Levofloxacin 750 mg daily</li><li>- Moxifloxacin 400 mg daily</li></ul>

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## COMMUNITY ACQUIRED PNEUMONIA (CAP) INPATIENT TREATMENT RECOMMENDATIONS

CLINICAL SCENARIO	TREATMENTS (Assume normal renal/hepatic function)
Severe Inpatient Pneumonia WITHOUT Risk Factors for MRSA or P. aeruginosa	Beta-lactam PLUS macrolide Beta-lactam PLUS fluoroquinolone

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## COMMUNITY ACQUIRED PNEUMONIA (CAP) INPATIENT TREATMENT RECOMMENDATIONS

CLINICAL SCENARIO	TREATMENTS (Assume normal renal/hepatic function)
<b>MRSA and/or P. aeruginosa coverage needed</b>  (Previous respiratory isolation in past year OR hospitalization and parenteral exposure in the last 90 days)	<b>MRSA</b> <ul style="list-style-type: none"><li>– Vancomycin 15 mg/kg every 12 hours adjusted for levels</li><li>– Linezolid 600 mg every 12 hours</li></ul> <b>P. aeruginosa</b> <ul style="list-style-type: none"><li>– Piperacillin-tazobactam 4.5 gm every 6 hours</li><li>– Cefepime 2 gm every 8 hours</li><li>– Ceftazidime 2 gm every 8 hours</li><li>– Imipenem-cilastin 500 mg every 6 hours</li><li>– Meropenem 1 gm every 8 hours</li><li>– Aztreonam 2 gm every 8 hours</li></ul>

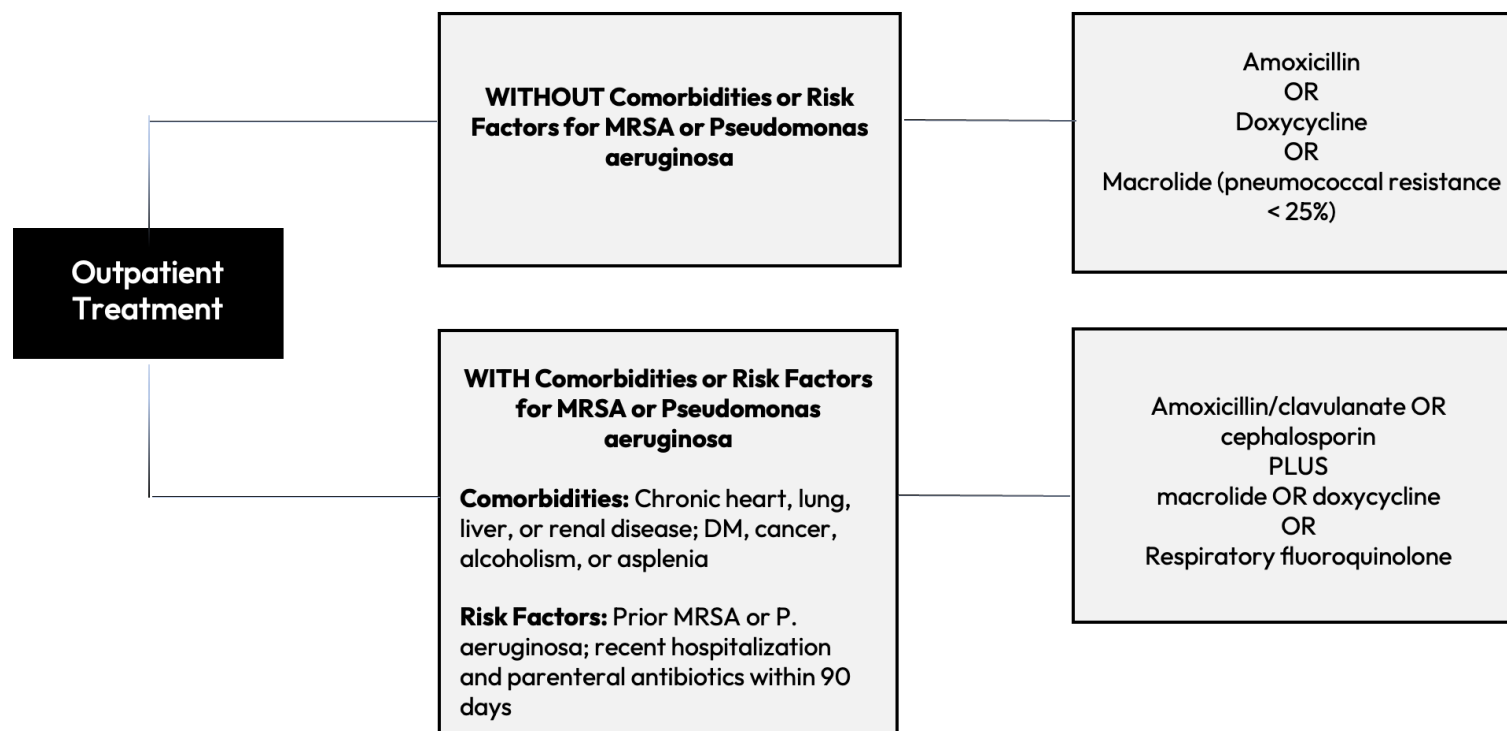
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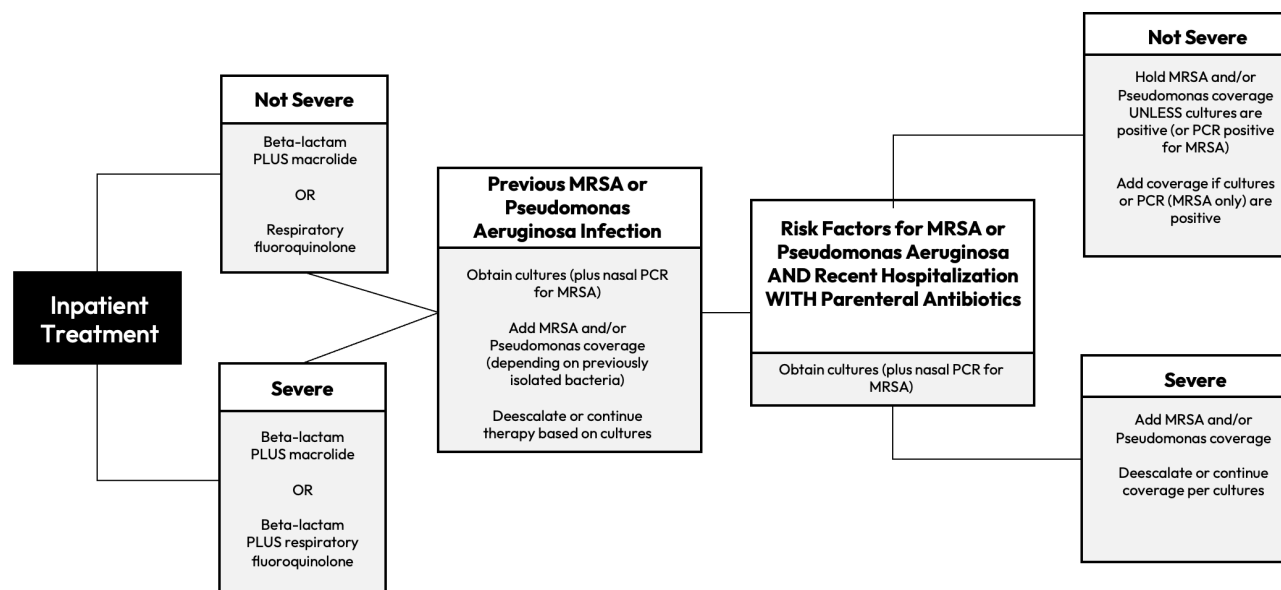
## OUTPATIENT TREATMENT ALGORITHM



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# COMMUNITY-ACQUIRED PNEUMONIA

## INPATIENT TREATMENT ALGORITHM



### Inpatient Therapies:

- **Beta-lactams:** ampicillin-sulbactam, cefotaxime, ceftriaxone, ceftaroline
- **Macrolides:** azithromycin or clarithromycin
- **Respiratory fluoroquinolone:** levofloxacin
- **MRSA coverage:** vancomycin or linezolid
- **Pseudomonas coverage:** piperacillin-tazobactam, cefepime, ceftazidime, imipenem, meropenem, or aztreonam

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