

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 ₂ < 60 mmHg	+10
	Pleural effusion	+10
PSI SCORING CLASSIFICATION		
RISK CLASS	TOTAL POINTS	DISPOSITION
Risk Class I or II <i>Note: Class I has no predictors.</i>	≤ 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">▪ Septic shock with need for vasopressors▪ Respiratory failure requiring mechanical ventilation
Minor Criteria	<ul style="list-style-type: none">▪ Respiratory rate \geq 30 breaths/min▪ $\text{PaO}_2/\text{FiO}_2$ ratio \leq 250 mmHg▪ Multilobar infiltrates▪ Confusion/disorientation▪ Uremia ($\text{BUN} \geq 20 \text{ mg/dL}$)▪ Leukopenia ($\text{WBC} < 4000 \text{ cells/mm}^3$)▪ Thrombocytopenia ($\text{PLT} < 100,000/\text{mm}^3$)▪ Hypothermia ($\text{Tmax} < 36^\circ\text{C}$)▪ Hypotension (requiring aggressive fluid resuscitation)



COMMUNITY ACQUIRED PNEUMONIA (CAP)

OUTPATIENT TREATMENT RECOMMENDATIONS

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

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COMMUNITY ACQUIRED PNEUMONIA (CAP)

OUTPATIENT TREATMENT RECOMMENDATIONS

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

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COMMUNITY ACQUIRED PNEUMONIA (CAP)

INPATIENT (NONSEVERE) TREATMENT RECOMMENDATIONS

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

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COMMUNITY ACQUIRED PNEUMONIA (CAP) INPATIENT TREATMENT RECOMMENDATIONS

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

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COMMUNITY ACQUIRED PNEUMONIA (CAP) INPATIENT TREATMENT RECOMMENDATIONS

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

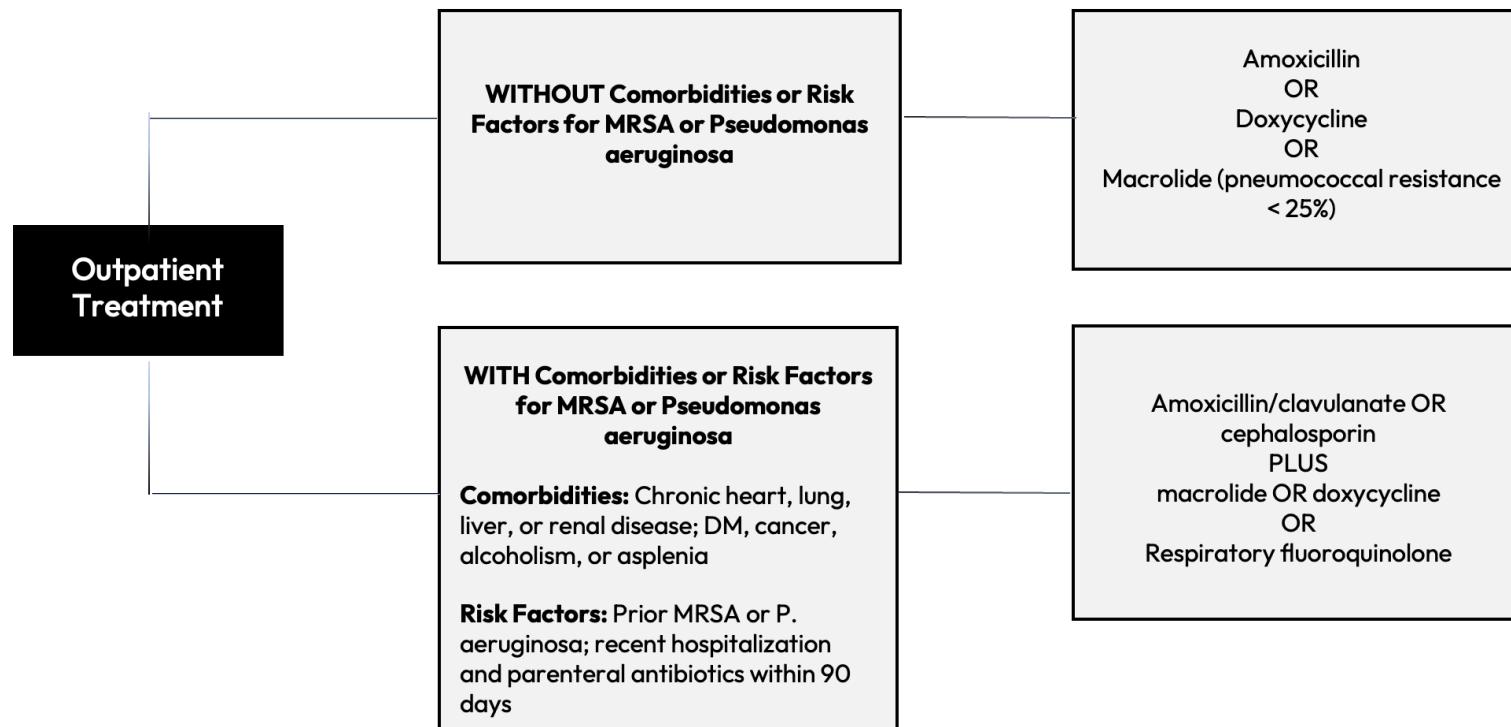
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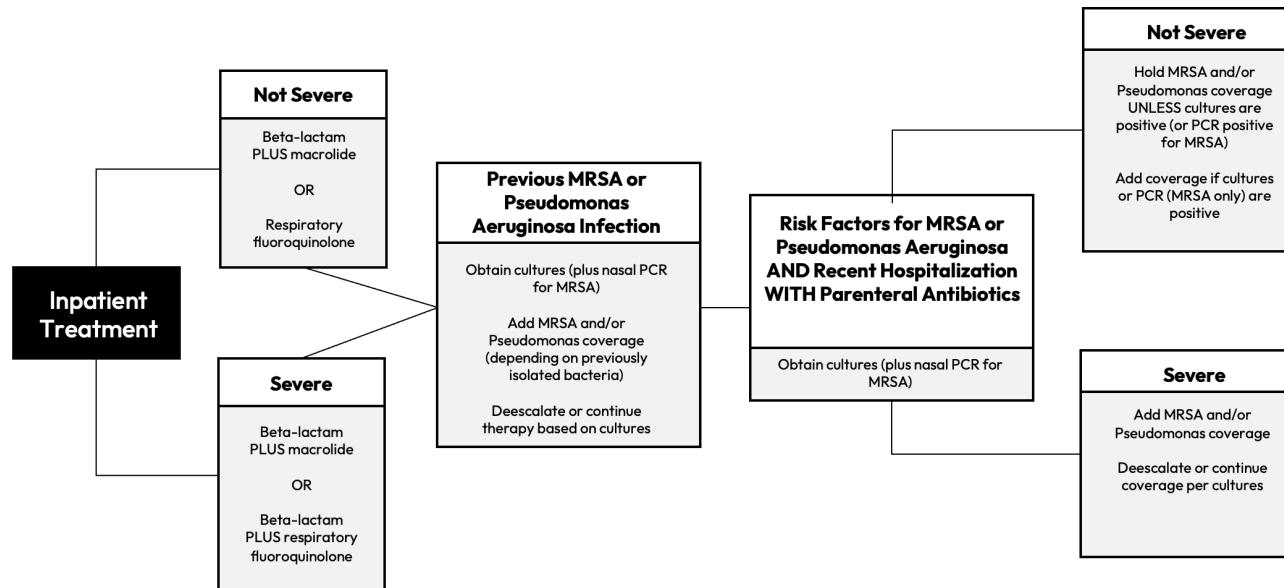
OUTPATIENT TREATMENT ALGORITHM



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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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