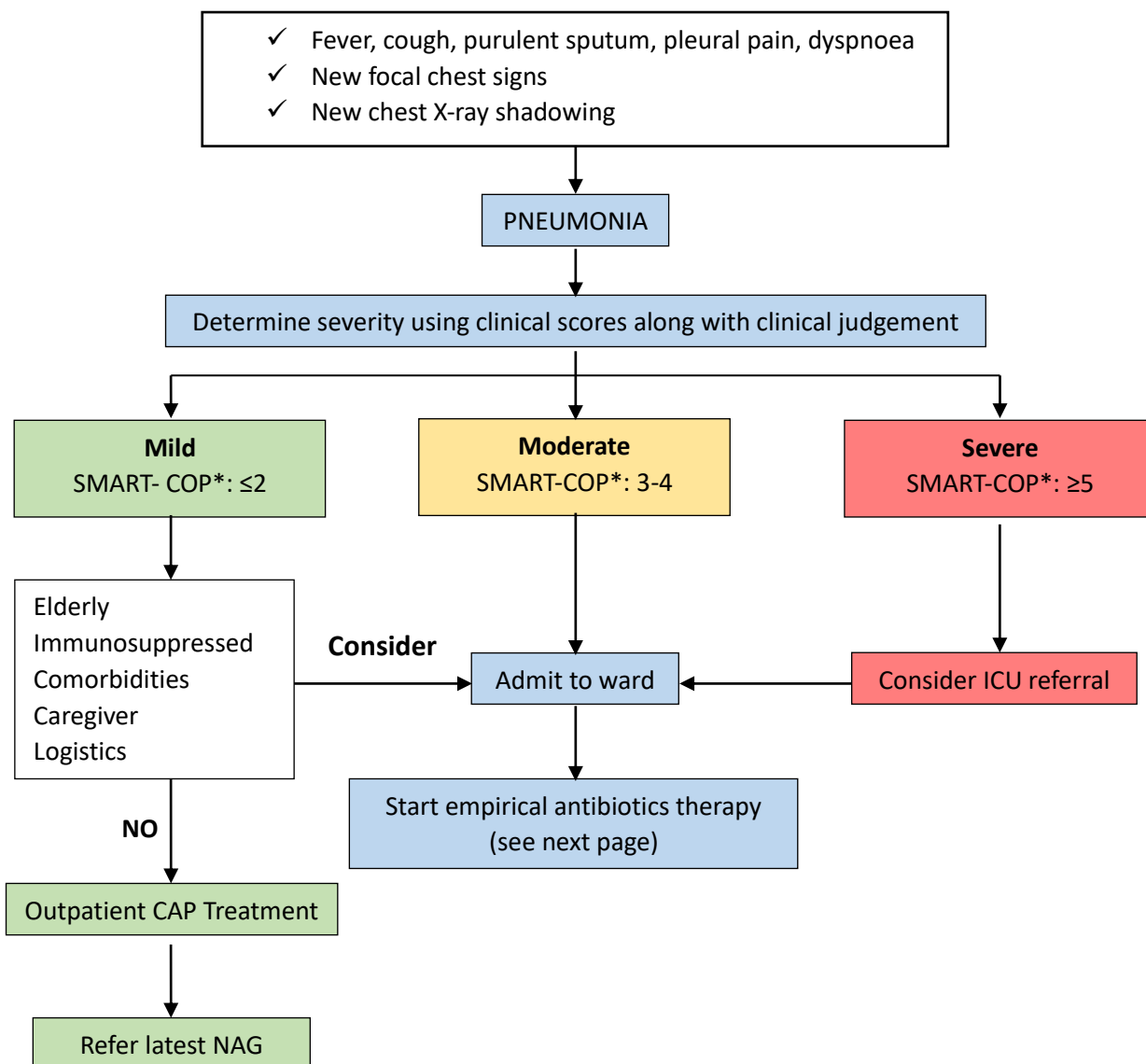


## Adult Pneumonia Treatment Algorithm (Revised Version 2023)

### Outpatient Management

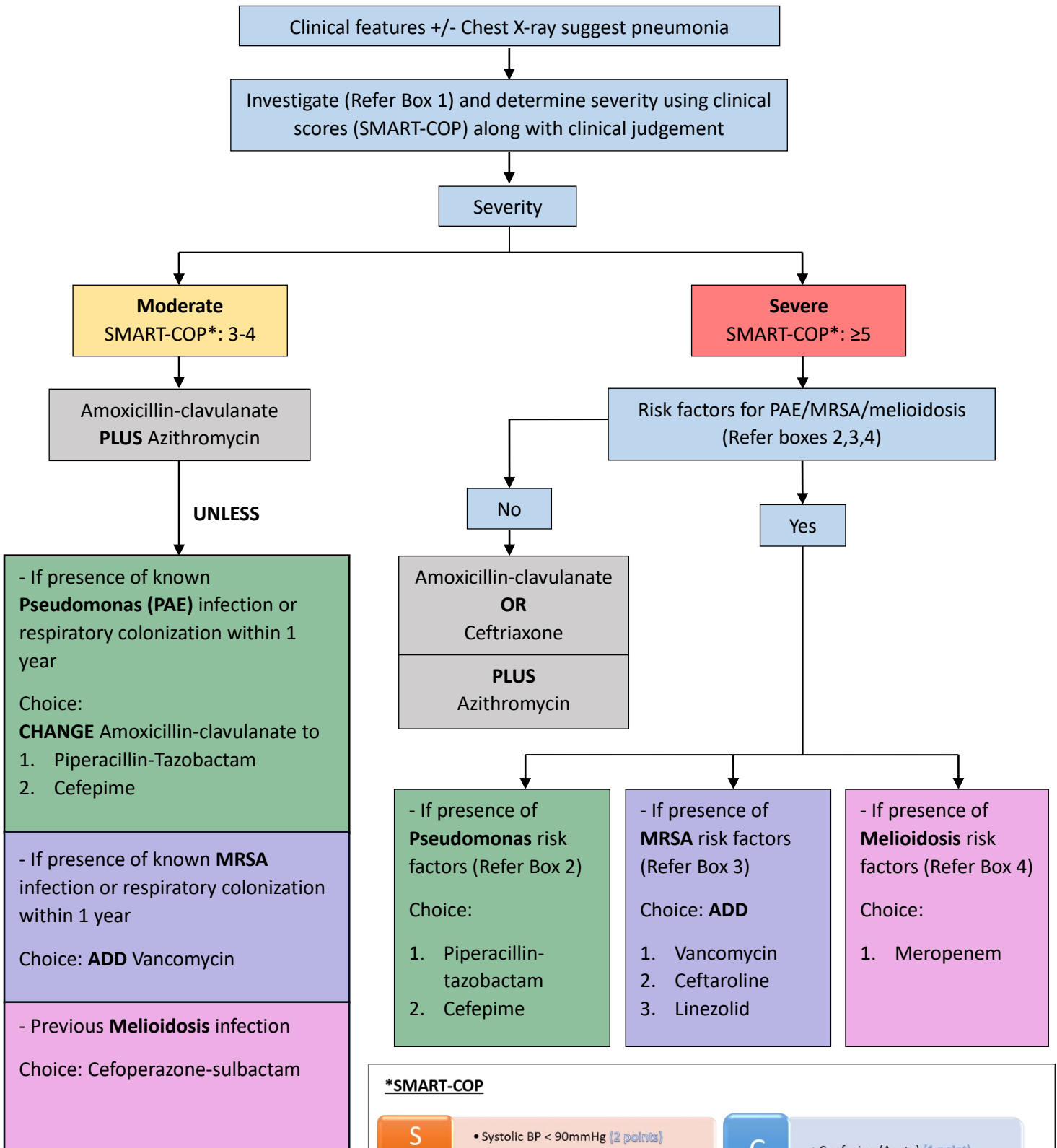


#### \*SMART-COP


<b>S</b>	• Systolic BP < 90mmHg (2 points)	<b>C</b>	• Confusion (Acute) (1 point)
<b>M</b>	• Multilobar CXR involvement (1 point)	<b>O</b>	• Oxygenation (Either 1) (1 point) • ≤ 50y/o: PaO <sub>2</sub> < 70mmHg / SpO <sub>2</sub> ≤ 93% / PaO <sub>2</sub> /FiO <sub>2</sub> < 333 • > 50y/o: PaO <sub>2</sub> < 60mmHg / SpO <sub>2</sub> ≤ 90% / PaO <sub>2</sub> /FiO <sub>2</sub> < 250
<b>A</b>	• Albumin < 35g/L (1 point)	<b>P</b>	• pH < 7.35 (2 points)
<b>R</b>	• RR ≥ 25 in ≤ 50 y/o (1 point) • RR ≥ 30 in > 50 y/o (1 point)		
<b>T</b>	• Tachycardia ≥ 125bpm (1 point)		



## Inpatient Empirical Antibiotics (Revised Version 2023)



### \*SMART-COP

<b>S</b>	• Systolic BP < 90mmHg (2 points)	<b>C</b>	• Confusion (Acute) (1 point)
<b>M</b>	• Multilobar CXR involvement (1 point)	<b>O</b>	• Oxygenation (Either 1) (1 point) • ≤ 50y/o: PaO2 < 70mmHg / SpO2 ≤ 93% / PaO2/FiO2 < 333 • > 50y/o: PaO2 < 60mmHg / SpO2 ≤ 90% / PaO2/FiO2 < 250
<b>A</b>	• Albumin < 35g/L (1 point)	<b>P</b>	• pH < 7.35 (2 points)
<b>R</b>	• RR ≥ 25 in ≤ 50 y/o (1 point) • RR ≥ 30 in > 50 y/o (1 point)		
<b>T</b>	• Tachycardia ≥ 125bpm (1 point)		

## BOX 1

### Diagnostic test for moderate and severe CAP

#### A) Required:

1. Sputum Culture + gram stain
2. Blood Culture (aerobe and anaerobe)
3. COVID-RTK Antigen
4. Sputum AFB smear (HIV or other immunosuppression; symptoms  $\geq$  2 weeks or having suggestive radiological findings)

#### B) Consider to send in specific settings (depending on severity, epidemiology, and risk factors)- To discuss with ID/microbiologists

Diagnosis	Clinical and epidemiological clues	Laboratory investigations
1. Influenza	<ul style="list-style-type: none"> <li>• Normal/low TWC</li> <li>• Peak influenza season</li> <li>• Outbreak settings</li> </ul>	Nasopharyngeal swab (NPS) for influenza A&B Antigen ➤ Consider empirical oseltamivir
2. MERS-CoV	Travel to endemic countries within 14 days	Sputum for MERS-CoV PCR
3. PCP	Untreated HIV or other immunosuppression	Induced sputum for <i>Pneumocystis jirovecii</i> (PJP) PCR
4. Respiratory viruses	<ul style="list-style-type: none"> <li>• Severe pneumonia with features suggestive of viral etiology</li> <li>• Severe pneumonia in immunocompromised host</li> <li>• Non-responding pneumonia</li> </ul>	NPS for respiratory multiplex PCR
5. Mycoplasma	Severe CAP with outbreak settings	Mycoplasma Total Antibody- Paired sera 14 days apart
6. Rickettsial disease	Exposure to tick or forested area	Rickettsia PCR IIP for typhus paired sera 14 days apart
7. Legionella	<ul style="list-style-type: none"> <li>• Severe CAP with suspected outbreak settings</li> <li>• Non responding pneumonia</li> </ul>	Urine for Legionella antigen
8. Q fever	Rural areas, exposure to livestock	Coxiella serology

## BOX 2

### Risk factors for PAE

Strong:

- Known Pseudomonas colonization/infection

Suspicious:

- Detection of gram-negative rods on a good quality sputum gram stain
- Hospitalization with receipt of IV antibiotics in the prior 3 months
- Recent hospitalization or stay in long term care facilities
- Recent antibiotics use of any kind
- Frequent COPD exacerbations – need glucocorticoids/antibiotics
- Structural lung disease
- Immunosuppression

## BOX 3

### Risk factors for MRSA

Strong

- Known MRSA colonization/infection

Suspicious

- Detection of gram positive cocci in clusters on a good quality sputum gram stain
- Recent hospitalization or antibiotics especially hospitalization with receipt of IV antibiotics in the prior 3 months
- Recent influenza like illness
- Necrotizing or cavitary pneumonia/empyema
- Immunosuppression (HIV, chronic steroid use)
- Risk factors- ESRD

## BOX 4

### Risk factors for Melioidosis ( $\geq 2$ )

- Diabetes Mellitus
- Presence of other foci of infections (e.g. intra-abdominal abscesses, septic arthritis)
- Occupation in farming, forestry, fishing, army
- Exposure to contaminated soil or river water

### Suggested Adult Dosage of Antibiotics (With Normal Renal and Liver Functions)

Antibiotic Group	Antibiotics	Suggested Dosage
Anti-virals	Favipiravir	<ul style="list-style-type: none"> <li>Influenza: 1600 mg PO q12H D1 then, 600 mg PO q12H D2-D5</li> </ul>
	Oseltamivir	<ul style="list-style-type: none"> <li>75 mg PO q12H</li> </ul>
Carbapenem	Meropenem	<ul style="list-style-type: none"> <li>1 gm IV q8H</li> </ul>
Cephalosporin	Cefepime	<ul style="list-style-type: none"> <li>2 gm IV q8H</li> </ul>
	Cefoperazone-Sulbactam	<ul style="list-style-type: none"> <li>2 gm IV q6H</li> </ul>
	Ceftazidime	<ul style="list-style-type: none"> <li>Melioidosis: 100-120 mg/kg/day IV divided q6-8H (Usual dose 2 gm q6-8H) Max dose: 8 gm / day</li> </ul>
	Ceftaroline	<ul style="list-style-type: none"> <li>600 mg IV q12H</li> </ul>
	Ceftriaxone	<ul style="list-style-type: none"> <li>2 gm IV q24H</li> </ul>
Macrolide	Azithromycin	<ul style="list-style-type: none"> <li>500 mg PO/IV q24H</li> </ul>
Penicillin	Amoxicillin	<ul style="list-style-type: none"> <li>1 gm PO q8H</li> </ul>
	Amoxicillin-Clavulanate	<ul style="list-style-type: none"> <li>625 mg PO q8H</li> <li>1.2 gm IV q8H</li> </ul>
	Ampicillin-Sulbactam	<ul style="list-style-type: none"> <li>750 mg PO q12H</li> <li>3 gm IV q6-8H</li> </ul>
	Piperacillin-Tazobactam	<ul style="list-style-type: none"> <li>4.5 gm IV q6H over 30 minutes <b>OR</b></li> <li>4.5 gm IV q8H over 4 hours</li> </ul>
Tetracycline	Doxycycline	<ul style="list-style-type: none"> <li>100 mg PO q12H</li> </ul>
Others	Vancomycin	<ul style="list-style-type: none"> <li>Refer DIAMS - Vancomycin Protocol for dosing</li> </ul>
	Linezolid	<ul style="list-style-type: none"> <li>600 mg PO/IV q12H</li> </ul>