

Pneumonia Study Cheat Sheet

Pneumonia Definitions

Community acquired pneumonia (CAP): an acute pulmonary parenchyma infection acquired in the community

Hospital acquired pneumonia (HAP): occurs ≥ 48 hours after hospital admission, not incubating at admission

Ventilator-associated pneumonia (VAP): HAP + develops ≥ 48 hours after endotracheal intubation

Note: The term health care-associated pneumonia (HCAP) had been used to identify patients at risk for infection with drug-resistant organisms, but was found to be overly sensitive and was dropped from 2016 IDSA guidelines.

- CAP organisms: *Streptococcus pneumoniae* (most common), *Haemophilus influenzae*, *Moraxella catarrhalis*, atypical bacteria (e.g., *Mycoplasma pneumoniae*, *Legionella pneumophila*, *Chlamydia pneumoniae*)
 - *Strep. pneumoniae* is alpha-hemolytic gram positive cocci in pairs or chains
- HAP & VAP organisms: Above plus MRSA, *Pseudomonas aeruginosa*, and other Gram negative rods
- With pneumonia related to aspiration, beware anaerobic organisms
- Use local resistance / epidemiological data + patient-specific data to identify potential pathogens/ resistance

Comparison of Select Oral Drugs Used For Pneumonia

	<u>Azithromycin</u>	<u>Amoxicillin/ clavulanic acid</u>	<u>Cefuroxime axetil</u>	<u>Doxycycline</u>	<u>Levofloxacin/ Moxifloxacin</u>
Brand name:	Zithromax, Zpak	Augmentin	Ceftin	Vibramycin, Doryx	Levaquin, Avelox
Mechanism:	Interferes with protein synthesis, inhibits 50S ribosomal subunit	Binds to penicillin binding proteins, inhibiting cell wall synthesis	Binds to penicillin binding proteins, inhibiting cell wall synthesis	Interferes with protein synthesis, inhibits 30S ribosomal subunit	Inhibit DNA gyrase + topoisomerase
Typical adult dose:	500mg x1, then 250mg daily	500-875mg BID	500mg BID	100mg BID	L: 500-750mg daily M: 400mg daily
Atypical activity	Yes	No	No	Yes	Yes
Renal adjust:	No	CrCl < 30	CrCl < 30	No	L: CrCl < 50; M: No
Side effects:	QT prolongation, GI effects	Diarrhea, hypersensitivity	Diarrhea, hypersensitivity	Esophagitis, photosensitivity	Many. See below + QT prolongation, photosensitivity, hypoglycemia
Notes:	Beware <i>Strep. pneumoniae</i> resistance	Reserve use for known sensitivity	Cefpodoxime is another oral 3 rd -gen cep	Avoid in children < 8 years b/c tooth and tissue ADRs	Reserve use when possible b/c ADRs

Drugs with *Pseudomonas aeruginosa* Activity

- Amikacin
- Aztreonam
- Ceftazidime
- Ceftazidime-avibactam
- Cefotolozane-tazobactam
- Cefepime
- Ciprofloxacin
- Colistin
- Delafloxacin
- Doripenem
- Gentamicin
- Imipenem-cilastatin
- Levofloxacin
- Meropenem
- Meropenem-vaborbactam
- Piperacillin-tazobactam
- Plazomicin
- Polymyxin B
- Tobramycin

Fluoroquinolone

FDA Boxed Warnings

1. Tendonitis
2. Tendon Rupture
3. CNS effects
4. Peripheral neuropathy
5. Worsening of myasthenia gravis

- Macrolides, fluoroquinolones, and tetracyclines are go-to drugs for atypical organisms
- Moxifloxacin & levofloxacin are “respiratory fluoroquinolones” for their coverage of *Strep. pneumo*
- Ceftriaxone + azithromycin = common inpatient CAP regimen
- Azithromycin has less drug-drug interactions or GI effects than clarithromycin or erythromycin
- If MRSA coverage is needed, use either linezolid or vancomycin
- Daptomycin should never be used for pneumonia, as it is inactivated by lung surfactant
- For suspected HAP, a negative MRSA colonization status has a high negative predictive value for MRSA pneumonia, and therefore can be used to help discontinue empiric anti-MRSA therapy
- Beware drug-resistant organisms in patients with antibiotic use within 90 days
- Inhaled antimicrobials (e.g., tobramycin, colistin) are sometimes employed, not usually as 1st-line
- Cefepime lacks anaerobic and Enterococci coverage, piperacillin-tazobactam does not

Abbreviations: ADR = adverse reactions, CAP = community acquired pneumonia, GI = gastrointestinal, HAP = hospital acquired pneumonia, MRSA = methicillin-resistant *Staphylococcus aureus*, TCP = thrombocytopenia, VAP = ventilator-associated pneumonia