

# Best Practice Guidelines for the Diagnosis and Management of Lower Respiratory Infection in Nursing Home Residents\*

(Excluding residents with respiratory failure on mechanical ventilation or with a tracheostomy)

## Background

- 1 in 10 nursing home (NH) residents receives antibiotics on any given day.
- Antimicrobial use varies greatly across NHs; more antibiotic adverse events occur in NHs with the highest use.
- Suspected respiratory infections are a common reason for starting antibiotics in the NHs
  - An appreciable portion of these starts may be inappropriate, often can be made with oral routes, and short duration
- There have been several examples of successful antimicrobial stewardship interventions in NH targeted at antibiotic use for lower respiratory infections – reducing antibiotic usage by about 30%.

## Objectives

- Provide decision making tools for providers considering antibiotic initiation for suspected lower respiratory infection.
- Present evidence-based guidelines to educate and advocate best antibiotic use for lower respiratory infections in the NH setting.

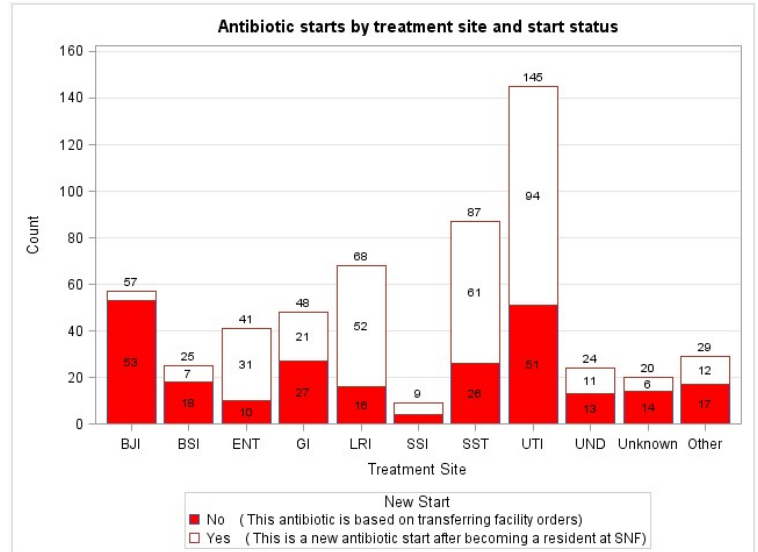
## Goals

- Agree to a more standardized approach to treating LRI that are consistent with updated national guidelines
- Reduce the rate of antimicrobial-related adverse events (i.e. NH-acquired *C. diff.* infection)
- Decrease the use of quinolones for treatment of respiratory illness.

Lower respiratory infection (LRI) is one of the top 3 most common sites for antimicrobial therapy.

- Most were new starts at the facility.
- This suggests that LRI is a good candidate for a targeted antimicrobial stewardship program QI activity.

Figure 1. All antibiotic starts by treatment site and status as “new start” at facility or started “on admission”, August 2018-June 2019).

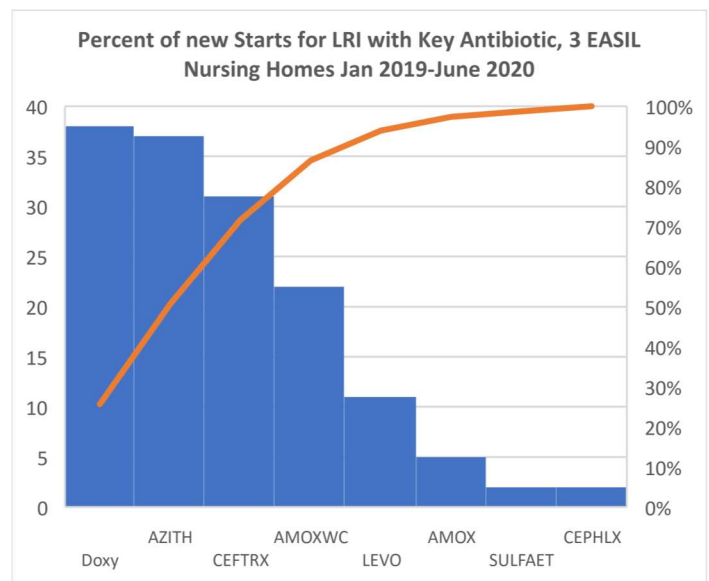


Choice of agent for LRI varies considerably and includes ceftriaxone (intramuscular injection), azithromycin, levofloxacin/ciprofloxacin, cephalexin, amoxicillin/clavulanate, doxycycline (Figure).

- New guidelines have published allowing some context to re-evaluate 1<sup>st</sup> line antibiotics
- Variability suggests deviations from best practice

Duration of antibiotics for LRI vary as well but overall most agents (other than macrolides) were prescribed for >5 days. New treatment guidelines recommend shorter durations, also being promoted as safe and effective by stewardship programs

- Now an opportunity to aim for 5 days of therapy, unless residents are slow to respond.



**Table 1.** Primary and secondary findings are necessary to initiate antibiotics for bacterial pneumonia (PNA) or COPD exacerbation.

Clinical Findings				Clinical Response		
Primary		Secondary		Primary and secondary both present	Either Primary or Secondary absent	
Afebrile	Other comorbidities	New productive cough	+ <b>Either of the following</b> A. Respiratory rate > 25/min B. Delirium	Start antibiotics	Start active monitoring	
	COPD pre-existing	Increased sputum purulence	+ <b>Either of the following</b> A. Increased dyspnea B. Increased sputum volume			
Fever	>100°F or > 2.0°F above baseline or 2 X >99°F	<b>≥1 of the following symptoms (including at least 1 Respiratory)</b>		(Tables 2 & 3)	(do not start antibiotics)	
		<b>Respiratory – at least one</b>				<b>Non-respiratory</b>
		<ul style="list-style-type: none"> <li>-New or increase cough</li> <li>-New or increase sputum</li> <li>-Pleuritic chest pain</li> <li>-Respiratory rate &gt; 25 breaths/min</li> <li>-Consolidation (on exam)</li> <li>-<b>Hypoxia (O2 sats &lt; 90%)*</b></li> </ul>				<ul style="list-style-type: none"> <li>-Delirium</li> <li>-Acute functional decline</li> <li>-<b>Total WBC &gt; 14,000*</b></li> </ul>
High (>102F)	Respiratory Rate >25 <b>and/or</b> New Productive Cough		Consider ED			

\* Secondary findings *italicized* may be documented/obtained by ordering these tests during active monitoring if resident initially does not meet criteria to start antibiotics

**TABLE 2. CLINICAL RESPONSE DETAILS**

<p>Start Antibiotics:  <b>Primary &amp; secondary findings</b> both present</p>	<p><b>Start Active Monitoring:</b>            Either Primary or Secondary findings are <b>absent</b></p>
<ul style="list-style-type: none"> <li>• <b>Test COVID PCR (+ isolation) if still active</b></li> <li>• <b>IF SEASONAL, √ RSV/INFLUENZA TESTING</b></li> <li>• Choose antibiotic <b>(Table 3)</b></li> <li>• Diagnostics only if               <ul style="list-style-type: none"> <li>○ If community/hospital legionella problem – test urine Legionella</li> <li>○ If not improving consider CXR, pulse oximetry, CBC</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Do not start antibiotics</b></li> <li>• <b>Consider COVID PCR test if still active monitoring</b></li> <li>• If seasonal, consider √ RSV/influenza testing</li> <li>• If concerned or not improved <b>√ CBC +/- CXR</b></li> <li>• Re-evaluate signs and symptoms every 24 hours.               <ul style="list-style-type: none"> <li>○ If not improved, consider                   <ul style="list-style-type: none"> <li>▪ upper respiratory infection (URI) (if productive cough is not noted)</li> <li>▪ non-infectious causes of pulmonary infiltrate, other infection source.</li> </ul> </li> </ul> </li> </ul>

\* In patients where suspicion of Legionella is low, and the burden/risks of sputum or urine acquisition is high, testing not justified. Urinary catheterization, induced sputum production, or nasotracheal suctioning are only necessary in patients or residents when suspicion of Legionella is high and require proper consent.

2019 American Thoracic Society/IDSA guidelines: (1) suggest Legionella antigen testing in cases where a known outbreak is occurring or severe disease in hospitalized patients; (2) adults with CAP when influenza viruses are circulating in the community test for influenza with a rapid molecular assay.

Table 3. Recommended agents and durations for Nursing Home Residents with Criteria to Start Antibiotics for Suspected Pneumonia

Mild-Moderate				
	Scenario	Antibiotic to Start	Dosing and Duration (5 days)*	Considerations
1 <sup>st</sup> line	Moderate illness, able to take oral medication**	Cefpodoxime	200 mg PO BID X 5 days	<b>Safe in mild PCN allergy</b> Q 24 hrs if CrCL <30; or post HD X 3 <b>Alternative cefuroxime 500 mg PO BID</b>
		Amoxicillin/ clavulanate	500 mg/125 mg TID X 5 days	Equivalent to 875/125 mg BID
2 <sup>nd</sup> line	Severe contraindications to 1 <sup>st</sup> line	Levofloxacin	750 mg PO Q 24 X 5 days OR if CrCL<20 or ESRD, 750 x 1 dose, then 500 mg Q 48 hours X 2 doses	Pose a higher risk for <i>C. difficile</i> infection Caution with anti-arrhythmic medications and prolonged QTc. Mild PCN allergy not an indication for quinolones
Special circumstances				
2 <sup>nd</sup> line	Unable to take oral meds	Ceftriaxone IM/IV	1000 mg IM Q 24 hours X 5	Reserve IM for severe illness but reluctant to evaluate in ED/Hospital
	Deterioration on oral agents, severe illness	Ceftriaxone IM/IV AND Doxycycline OR Azithromycin		
	Risk for Pseudomonas***	Levofloxacin monotherapy	As above	
	Risk MRSA***	Doxy + 1 <sup>st</sup> line	100 mg BID X 5 days + 1 <sup>st</sup> line	Add doxy to first line agents.
	Risk of or suspect aspiration	Use either 1 <sup>st</sup> line	Duration should be maintained at 5 days	Add anaerobic coverage only if abscess or empyema suspected: then amox/clavulanate, or ceftriaxone/metronidazole

\* Duration is 5 days. Only extend to 7 if signs/symptoms not improved at day 5 (i.e., still fever, use of supplemental O2, unstable vital signs).

\*\*We recommend B-lactam monotherapy. 2019 ATS/IDSA guidelines recommend combination therapy (b-lactam/macrolide) for outpatients with co-morbidities, but for nursing home residents without typical community-exposure to atypical organisms, min role for combination therapy, but not contraindicated. **Co-morbidities** include chronic heart, lung, liver, renal disease; diabetes, alcoholism, malignancy, asplenia.

\*\*\* for MRSA = history of clinical culture with MRSA (sputum, wound, nasal) in past year; for Pseudomonas = history of + PSA in Sputum in past year or bronchiectasis/FEV1<35%. If NOT transferring to ED to get new sputum culture, use levofloxacin (pseudomonas) or doxy + 1<sup>st</sup> line agent (for MRSA). **IF able** to order sputum microbiology, stop additional coverage if no Pseudomonas or MRSA recovered.

### Sources and Points.

Recommendations modified from Naughton BK, Mylotte, JM. Treatment Guideline for Nursing Home-Acquired Pneumonia Based on Community Practice. J. Amer Geriatric Soc. 2000 48;82-88. And 2019 ATS/IDSA guidelines.

<https://www.atsjournals.org/doi/full/10.1164/rccm.201908-1581ST>

**Best Practice** were assembled by the Emory Antimicrobial Stewardship in Long-term Care Group (EASIL). This document is an adaptation of a similar document from the Rochester Long Term Care Collaborative. Guidelines were adjusted in consultation with facility medical direction. However, these guidelines are intended to serve as a reference for treating patients with a suspected respiratory infection, not as a rigid set of criteria to replace clinical judgement.