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<table>
<tr><td>Title</td><td colspan="6">Implementation and assessment of a guideline-based treatment algorithm for community-acquired pneumonia (CAP)</td></tr>
<tr><td>Study Facility</td><td colspan="6">Providence St. Patrick Hospital - Missoula, MT
211 bed, nonprofit community hospital</td></tr>
<tr><td>Disclosures</td><td colspan="6">IRB exemption granted
No conflicts of interest or project sponsorship to report.</td></tr>
<tr><td rowspan="3">Study Design/ methodology</td><td colspan="6">Retrospective, single-center, observational review of antibiotic use for inpatients with CAP</td></tr>
<tr><td colspan="2">Primary endpoint:</td><td colspan="4">Secondary endpoints:</td></tr>
<tr><td colspan="2">• Rate of appropriate empiric antibiotic prescribing as defined by the CAP algorithm</td><td colspan="4">• Antimicrobial duration of therapy (DOT)
• Time to antibiotic de-escalation or IV to PO
• Rate of positive microbiology tests
• Rate of Clostridium difficile infections
• Length of hospital stay
• Readmissions within 30 days of discharge</td></tr>
<tr><td>Purpose/ Background</td><td colspan="6">• As part of a system antimicrobial steward effort, antibiotic use must be tracked and assessed for appropriateness. In addition, there is anecdotal evidence leading up to the study that fluoroquinolones are being over utilized for CAP.
• The aim of this study was to retrospectively review patients admitted with CAP for selection of appropriate empiric antibiotics, and attempt to improve upon empiric prescribing via education and CAP treatment algorithm implementation.</td></tr>
<tr><td rowspan="2">Population/ Treatment Groups</td><td colspan="3">Pre-Intervention Group</td><td colspan="3">Post-Intervention Group</td></tr>
<tr><td colspan="3">Adult patients with a diagnosis of CAP admitted to the hospital from August 2016 to February 2017.</td><td colspan="3">Adult patients with a diagnosis of CAP admitted to the hospital. Time frame to be determined.</td></tr>
<tr><td>Planned Intervention</td><td colspan="6">• Development of a treatment algorithm for CAP to guide empiric antibiotic prescribing in collaboration with infectious disease physicians and antimicrobial stewardship pharmacist.
• Provider education regarding current trends and utilization of antibiotics for CAP.</td></tr>
<tr><td rowspan="2">Preliminary Results Summary</td><td>Time Period (8/2016 to 2/2017)</td><td>Rate of appropriate empiric antibiotics</td><td>Antimicrobial days of therapy, median (IQR)</td><td>Mean time to PO (hours)</td><td>Length of Hospital Stay (days), median (IQR)</td><td>30 day readmission, n (%)</td></tr>
<tr><td>Pre-Intervention, n= 114</td><td>97 (85%)</td><td>8 (7 – 10)</td><td>Ceftriaxone = 74.4
Azithromycin = 32.7
Doxycycline = 55
Levofloxacin = 73.8</td><td>4.5 (3 – 7)</td><td>12 (11%)</td></tr>
<tr><td rowspan="2">Conclusions</td><td colspan="6">Author Conclusions</td></tr>
<tr><td colspan="6">• Empiric prescribing is good based upon the pre-intervention period.
• Areas for improvement include:
• Azithromycin duration of therapy
• Discharging on levofloxacin after initial treatment with beta-lactam and azithromycin
• Clarification of allergies and reactions to medications to aid in appropriate antibiotic prescribing</td></tr>
<tr><td rowspan="2">Comments</td><td colspan="2">Limitations</td><td colspan="4">Future Directions</td></tr>
<tr><td colspan="2">• Retrospective chart review dependent upon documentation at the time
• Lacking external validity due to local antibiograms, prescribing culture, etc.</td><td colspan="4">• Education
• Algorithm
• Azithromycin duration of therapy
• Allergy clarification and documentation
• Doxycycline and levofloxacin bioavailability
• Reinforcement of current empiric prescribing and update new IDSA/ATS CAP guideline that is in progress</td></tr>
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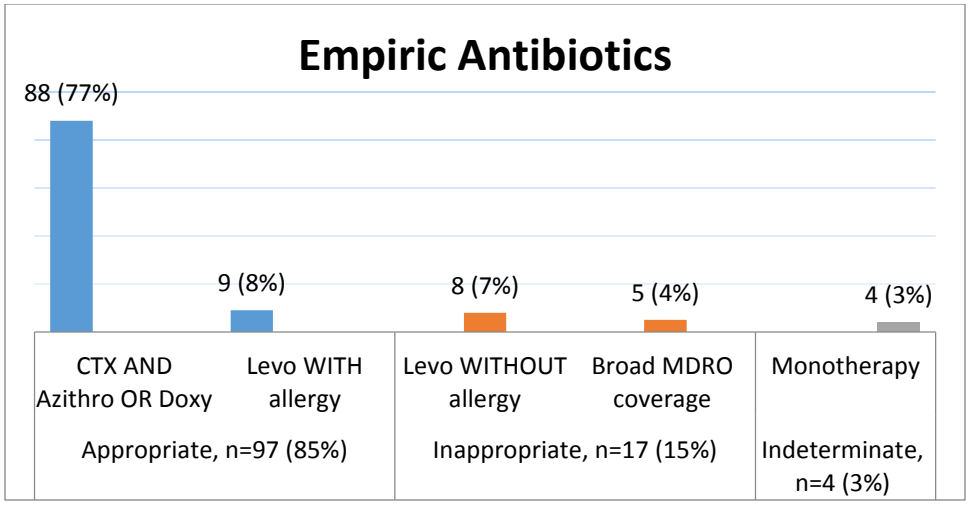

Figure 1. Empiric antibiotic selection for patients requiring admission for CAP. Allergy is defined as Type 1 IgE mediated Beta-lactam allergies such as anaphylaxis, which renders beta-lactam therapy contraindicated and leaves levofloxacin as the preferred treatment option. Indeterminate is monotherapy, in this case ceftriaxone (n=2) and doxycycline (n=2), that is preferred from an antimicrobial stewardship standpoint, but does not meet guideline recommendations of beta-lactam plus atypical organism coverage. No patients included in the indeterminate category were readmitted within 30 days of discharge.

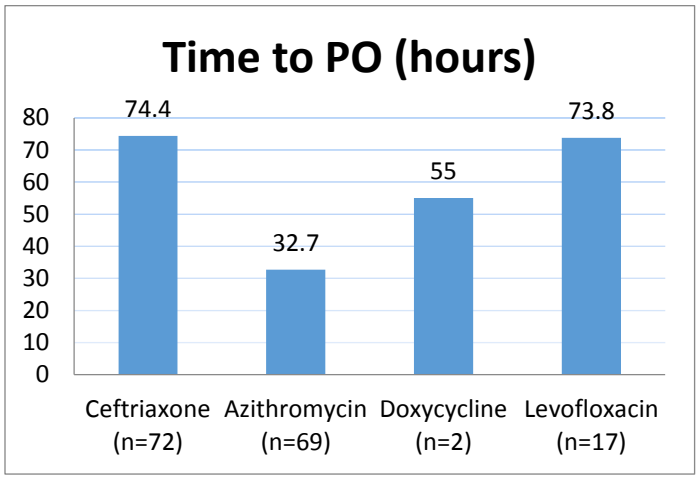

Figure 2. Doxycycline and levofloxacin have complete absorption and bioavailability of ~100%. Transition to PO can occur more quickly because of this pharmacokinetic characteristic.

Duration of Therapy	
Total, median (IQR)	8 (7 to 10)
Inpatient, median (IQR)	4 (3-7)
Azithromycin, n (%)	
≤3 days	45 (50)
≥3 days	45 (50)

Table 1. Total duration of therapy is good. Azithromycin 500 mg for 3 days is considered a full treatment course due to long half-life and post-antibiotic effect. The exception is *Legionella,* which requires 7-10 days.

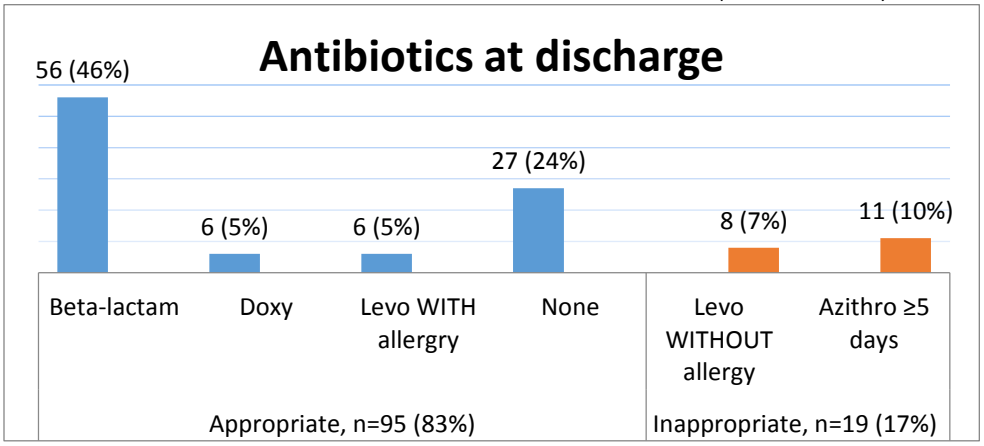

Figure 3. Antibiotic selection at discharge. Five of eight patients discharged on levofloxacin were initially treated the preferred beta-lactam plus azithromycin or doxycycline regimen, which is not preferred by our AMS team.