**MULTICARE Health System Care of the Adult Pneumonia Patient**

**Target Audience:**
The target audience for this clinical guideline is all MHS employed providers within Primary Care, Urgent Care, and In-Hospital Care. The secondary audience includes all clinical support staff in these areas: Pharmacy, Nursing, Imaging, Lab, Care Management, Transitions of Care, and Respiratory Therapy. An additional audience includes providers and staff associated with our Clinically Integrated Network.

**Scope/Patient Population:**
This guideline applies to all adult patients in MultiCare’s adult hospitals to include Tacoma General, Allenmore, Good Samaritan, Auburn Medical Center and all of MultiCare Health System’s primary care and urgent care clinics.

The target patient population includes Community Acquired Pneumonia (CAP), Aspiration Pneumonia, Hospital Acquired Pneumonia (HAP), and Health Care Associated Pneumonia (HCAP)

**Rationale:**
Pneumonia and influenza together are ranked as the eighth leading cause of death in the United States. Pneumonia consistently accounts for the overwhelming majority of deaths between the two. In 2006, 55,477 people died of pneumonia. ([Am Lung Association](https://www.amERICAN-lung-Association.org))

The **inpatient Community Acquired Pneumonia (CAP) algorithm** is evidence based and designed to guide providers to the appropriate, CMS core measure compliant therapy choice. The inpatient Healthcare Associated Pneumonia (HCAP) section has been updated from the outdated 2005 IDSA HCAP/HAP guidelines. This section, based on a combination of recent literature, expert infectious disease opinion, and local susceptibility patterns, represents a progressive, algorithm-based approach to the selection of HCAP therapy stratified and based on the patient’s severity of illness and overall risk factors for a drug resistant pathogen. The **outpatient Community Acquired Pneumonia (CAP) algorithm** is based on risk from a [CURB-65 Score](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4049950/).

If the patients are engaged and involved with their care by use of [tools](https://www.magicaltools.com), the outcomes will be improved.
**Objective**

**Goal Statement**

Reduce the mortality rate associated with pneumonia and rates of both admission and readmission to healthcare facilities when avoidable. This will decrease the cost per case, and maintain or improve the LOS required to treat pneumonia.

Standardize and improve appropriate antibiotic treatment for Pneumonia patients at all MultiCare entities by providing the correct dosage and proper adjustments for weight, allergies, resistant organisms, and renal function through the use of a single, validated order set.

**Recommendations:**

**Antibiotic Treatment Choices: Based on Severity, Description and Decision to Admit to Hospital**

<table>
<thead>
<tr>
<th>Community Acquired Pneumonia (CAP) – Outpatient Treatment</th>
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| Previously healthy with no risk factors for drug-resistant S. pneumoniae | o Macrolide  
| |  
| | o Doxycycline if patient has known QT interval prolongation or risk factors  
| Comorbidity or risk factor for drug-resistant S. pneumoniae | o Macrolide AND Beta-lactam  
| | o Fluoroquinolone if Respiratory history  

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<thead>
<tr>
<th>Community Acquired Pneumonia (CAP) – Inpatient Treatment</th>
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</table>
| Previously healthy with no risk factors for drug-resistant S. pneumonia | o Ceftriaxone OR Unasyn + Azithromycin OR Doxycycline  
| | o Fluoroquinolone if Respiratory History  
| ICU | o Ceftriaxone AND Azithromycin  
| | o Ceftriaxone AND Respiratory fluoroquinolone  
| Pseudomonas Risk | o Cefepime OR Zosyn OR Imipenem AND Ciprofloxacin  
| Aspiration Suspected | o Unasyn AND Azithromycin  
| MRSA Risk | o Vancomycin  
| | o Linezolid |
### CURB Score > 2, Then Recommend Admission

#### Healthcare-Associated Pneumonia (HCAP) – Inpatient Treatment

| 0 – 1 Multi-drug resistant (MDR) Risk Factor Calculation (no sepsis or non-severe sepsis present) | Ceftriaxone OR Unasyn + Azithromycin OR doxycycline OR Fluoroquinolone if Respiratory history |
| 0 – 1 MDR Risk Factor (severe sepsis and/or immunosuppression) | Zosyn OR Cefepime OR Imipenem + azithromycin OR Doxycycline |
| ≥ 2 MDR risk factors | Zosyn OR Cefepime OR Imipenem AND Ciprofloxacin OR Tobramycin |
| High or Known MRSA Risk | Vancomycin OR Linezolid |
TABLE 2. RISK FACTORS FOR MULTIDRUG-RESISTANT PATHOGENS CAUSING HOSPITAL-ACQUIRED PNEUMONIA, HEALTHCARE-ASSOCIATED PNEUMONIA, AND VENTILATOR-ASSOCIATED PNEUMONIA

- Antimicrobial therapy in preceding 90 d
- Current hospitalization of 5 d or more
- High frequency of antibiotic resistance in the community or in the specific hospital unit
- Presence of risk factors for HCAP:
  - Hospitalization for 2 d or more in the preceding 90 d
  - Residence in a nursing home or extended care facility
  - Home infusion therapy (including antibiotics)
  - Chronic dialysis within 30 d
  - Home wound care
  - Family member with multidrug-resistant pathogen
- Immunosuppressive disease and/or therapy

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<thead>
<tr>
<th>Hospital-acquired pneumonia (HAP) and Ventilator-associated pneumonia (VAP)</th>
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<tr>
<td><strong>Early Onset HAP</strong></td>
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<td>o Ceftriaxone AND Azithromycin OR</td>
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<tr>
<td>o Doxycycline</td>
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<tr>
<td>o Fluoroquinolone with Respiratory History</td>
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<tr>
<td><strong>Late onset HAP</strong></td>
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<tr>
<td>o Cefepime OR</td>
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<tr>
<td>o Zosyn OR</td>
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<tr>
<td>o Imipenem AND Ciprofloxa</td>
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**Evidence:**
Reference Document
1. IDSA and ATS Consensus Guideline on Community Acquired Pneumonia
2. IDSA and ATS Consensus Guideline on Hospital Acquired, Ventilator-associated, Healthcare-associated Pneumonia

Other References:


Infectious Disease Society of America (IDSA); American Thoracic Society (ATS)

**Implementation Items:**

**MultiView Applications**

MultiView– Order set adherence application is *in test* and will be available by December 1, 2014.

Health Catalyst Advanced Application – is under construction, a final Go Live date has not yet been determined.

**Order Sets and Smart Sets**

1. MHS PCP/UCC Suspected Pneumonia Smart Set Amb #5011
2. MHS ED Pneumonia Order Set #11073
3. MHS Pneumonia Admission Order Set #11068
4. MHS Hospitalist Pneumonia Order Set #11074
Patient Education materials

1. Patient Information: A patient information sheet regarding pneumonia information for the patient can be found by clicking [here].


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**Metrics Plan:**
**AIM Statements**

1. 95% of providers will follow the Pneumonia Order Set when treating patients diagnosed with Pneumonia in MHS’ Primary Care, Urgent Care, and In Hospital care settings by February 28, 2015.

2. 95% of patients diagnosed with Pneumonia in Primary Care, Urgent Care, and In-hospital will receive the correct antibiotic dosage & proper adjustments for weight, allergies, resistant organisms, and renal function by February 28, 2015.

3. Pneumonia Readmissions & Mortality will decrease as a result of implementing and adhering to the order sets & smart set.

MultiView PNA readmissions and Smart Set & Order Set adherence applications will be monitored by the Medicine Collaborative for the immediate post Go Live period.

All suggestions for change or improvements will be captured using standard project management methodologies and the MHS MOCHA system. Suggestions will be compiled and brought to the Physician Leaders of the Medicine Collaborative for action.

The Medicine Collaborative will continue to review all pneumonia readmissions on a quarterly basis for 3 quarters following the Go Live date. This data will be aggregated and brought back to the Physician Leaders for action.

**PDCA Plan:**

The Medicine collaborative implementation team will utilize standard project management methodologies and existing MHS processes to ensure a successful launch & adoption of order sets and smart set.

1. All EPIC functionality issues should be called in to the MHS help desk at 403-1160 then press #1 for non-urgent or #5 for urgent issues.
2. Order set and Smart set accessibility and operational issues should be reported through the Clinical Informaticist normally assigned to your area.
3. The Collaborative team and the Clinical Application Services team will work to ensure that all reported problems/issues are resolved.

*The Medicine Collaborative will be responsible for ongoing and active care of the Adult Pneumonia Patient*
surveillance of the MultiView Pneumonia application data, the MultiView Order Set usage data, and quarterly chart review of all patients readmitted with any pneumonia diagnosis code.

The assigned MMA physician leader will be responsible to ensure that the content of the Pneumonia order sets and smart sets remain current against recognized industry standards in research and literature.

### Point of Contact: Medicine Collaborative (Current Chair until delegated to other Point of Contact)

<table>
<thead>
<tr>
<th>Approval By</th>
<th>Date of Approval</th>
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<tr>
<td>MMA Clinical Quality &amp; Compliance Committee</td>
<td><strong>August 2014</strong></td>
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<tr>
<td>Urgent Care Collaborative</td>
<td><strong>August 2014</strong></td>
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<tr>
<td>Emergency Department Provider Meeting</td>
<td><strong>July/August 2014</strong></td>
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<td>MultiCare Inpatient Specialist Meeting</td>
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<td>Sound Inpatient Providers</td>
<td><strong>September 2014</strong></td>
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<td>Medical Imaging Northwest</td>
<td><strong>July 2014</strong></td>
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<tr>
<td>Pharmacy and Therapeutic Committee</td>
<td><strong>September 2014</strong></td>
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<td>MHS Nurse Executive Committee</td>
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<td>ESOC</td>
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<td>Auburn Medical Executive Committee</td>
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<td>TG/AH Medical Executive Committee</td>
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<td>Good Samaritan Medical Executive Committee</td>
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| Original Date:                                    | November 2014                     |
| Revision Dates:                                   | X/XX; X/XX                       |
| Reviewed with no Changes Dates:                  | X/XX; X/XX                       |
| Distribution: MHS Intranet                       |                                   |

Attachment A. MHS Pneumonia Adult Clinical Pathway (Algorithm)
MHS Adult Pneumonia Clinical Pathway

Patient presents with symptoms to UCC or PCP

- CURB 65 Assessment
  - CURB score 0-1
  - CURB score 2
  - CURB score 3+

- Outpatient treatment with or without MHS Direct Transfer (if ambulatory)
  - Treatment with or without PCP
    - High risk to fail outpatient therapy
      - Referral by provider to AUC/PM
        - Follow up in 3 days with PCP
        - Education
          - Patient education including handout
          - Red, Yellow, Green Self Management Tool
          - Home medications

- Admit to Hospital Inpatient Treatment using MHS Pneumonia Admission Order Set (110085)
  - Admission
    - Red, Yellow, Green Self Management Tool
      - Home medications
      - Follow up with PCP
      - Treatment complete
    - Moderate Risk
      - Admission
        - High or Moderate Risk
          - Decision: Intensive Care Unit
            - Follow up and made by Inpatient Care Manager
            - Intensive risk, within 2 days of DC
              - Moderate risk, within 4 days of DC
            - Follow up within 48 hours of discharge
              - Treatment complete

- Discharge Planning
  - Intensive and respiratory care items for home use
    - Follow up with PCP within 48 hours
    - Without PCP care set up with a provider before DO
    - Transfers of Care will be made with intensive care and high risk patients by phone
      - Treatment complete