Pneumonia Algorithm
Please review definition and pathophysiology when using the algorithm

Assess for the presence of risk factors for nosocomial Pneumonia (acquired in a hospital or LTC facility)

- Host factors: underlying disease; COPD, immunosuppression, CNS depression/impaired consciousness, surgery esp. thoracic and abdominal
- Device relate: endotracheal intubation and mechanical ventilation, NGT placement and enteral feeding
- Procedure related: cross contamination by personnel, antibiotic administration, contaminated aerosol devices
- Exposure to age

Assess for the presence of risk factors for community acquired Pneumonia (not acquired in a hospital or LTC facility)

- Aspiration or Exposure to pathogen, recent respiratory infection
- Alcohol abuse, smoking
- Extremes of age
- Human immunodeficiency virus or immunocompromised
- Recent antibiotic therapy or resistance to antibiotics
- Co morbidities; Asthma, Cerebrovascular disease, Chronic obstructive pulmonary disease, Chronic renal failure, Congestive heart failure, Diabetes, Liver disease
- Neoplastic disease, transplant recipients, s/p splenectomy, Individuals that reside in residential facilities

YES
Are Risk Factors Present?

NO

Monitor for presence of signs/ symptoms:
Temperature greater than 38˚C (100.4˚F)
Cough with or without sputum, hemoptysis
Pleuritic chest pain
Myalgia
Gastrointestinal symptoms
Dyspnea
Malaise, fatigue
Rales, rhonchi, wheezing
Egophony, bronchial breath sounds
Dullness to percussion
Change in mental status in older patients

Symptom Box

Are positive findings present?

Stable?

Potentially unstable?

Initiate client education for Health Seeking Behaviors to identify:
- Do not smoke
- Encourage infection protection, handwashing
- Encourage management of comorbidities
- Maintain adequate nutrition, sleep/rest, activity
- Get flu shot and pneumococcal vaccine if candidate
- Teach s/s of known risk factors to report
- Teach s/s of pneumonia

Box 1

Initiate the plan of care for a Risk for Ineffective Therapeutic Regimen management:
Health teaching focuses on instruction in:
- Disease process and course
- Lifestyle modifications & management of comorbidities
- Antibiotic therapy compliance, bronchodilators, mucolytics, pain reliever, antipyretics, oxygen therapy and hydration
- Chest PT, cough and deep breathing exercises and incentive spirometry
- Signs and symptoms of sepsis, respiratory failure, and dehydration to report to their doctor that indicates that they are experiencing a complication

Follow collaborative plan of care for PC:
hypoxemia, PC: sepsis in addition to care for a client with an infection and ineffective airway clearance and risk for infection transmission if indicated
Collaborative Problem

**OUTCOMES/BENCHMARKS:**
- Pulse > 95%
- ABGs within normal limits
- Respirations even, unlabored, RATE -12-20 lungs clear to auscultation
- Alert and oriented X 3

### Potential Complication: Hypoxia

<table>
<thead>
<tr>
<th>ASSESS s/s of hypoxia:</th>
<th>Monitor for presence of the disorder</th>
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</thead>
<tbody>
<tr>
<td>Change in mental status</td>
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<tr>
<td>Respiratory distress</td>
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<tr>
<td>use of accessory muscles</td>
<td></td>
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<tr>
<td>adventitious breath sounds, Egophony</td>
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<tr>
<td>dullness to percussion</td>
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<tr>
<td>Increased sputum production</td>
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</tbody>
</table>

**Assess for contributing factors:**
- Host factors: underlying disease; COPD, immunosuppression, CNS depression/impaired consciousness, surgery esp. thoracic and abdominal
- Device relate: endotracheal intubation and mechanical ventilation, NGT placement and enteral feeding
- Extremes of age

**Monitor for presence of the disorder**
- Monitor VS; assess respiratory rate, depth and effort
- Monitor pulse oximetry for declining O2 sat.
- If O2 sat < 90-95% obtain ABG’s as per MD order to evaluate for acidosis and hypoxemia
- Monitor results from Chest Xray results for evidence of infiltrate/effusion

**Monitor results of peak flow if CAL is present**

### DO

**Perform nursing actions that correct hypoxemia**
- Position HOB elevated to allow for adequate chest expansion
- Administer supplemental oxygen as prescribed and evaluate effectiveness
- Administer bronchodilators as ordered and as needed when wheezing and decreased peak flow is present
- Provide mucolytics to thin secretions
- Instruct in cough and deep breathing exercises and incentive spirometry to prevent/reverse atelectasis
- Suction for ineffective cough
- Perform chest PT as prescribed

### CALL

- Monitor for worsening hypoxemia that is unresponsive to supplemental oxygen, declining consciousness, hypercapnia, acidosis
- Initiate airway management and ventilation. Activate the rapid response team to prepare to intubate and call MD

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Susan McCabe revised 12/09
Collaborative Problem

OUTCOMES/BENCHMARKS:
- Afebrile denies fever, chills, or malaise
- Negative blood culture/sputum cultures
- WBC 4.3 to 10.8 x 10⁹ cells per liter

### Potential Complication: Sepsis

**ASSESS s/s of sepsis**
- Temperature greater than 38.0°C or less than 36.0°C
- Heart rate greater than 90 beats per minute
- Respiratory rate greater than 20 breaths per minute
- WBC count greater than 12,000 cells/µL, less than 4000 cells/µL, or more than 10% bands
- Chills, diaphoresis

**Assess for contributing factors:**
- Host factors: underlying disease; COPD, immunosuppression, CNS depression/impairment, consciousness, surgery esp. thoracic and abdominal, Device relate: endotracheal intubation and mechanical ventilation, NGT placement and enteral feeding, Procedure related: cross contamination by personnel, antibiotic administration, contaminated aerosol devices
- Extremes of age, Exposure to pathogen

**Monitor for presence of the disorder**
- Monitor VS for tachypnea, tachycardia, abnormal temperature (too high or low)
- Monitor CBC and diff for leukocytosis/leucopenia and left shift
- Perform blood cultures for elevated temp as per MD orders
- Monitor culture reports for sputum/blood
- Monitor Hemoglobin and hematocrit to ensure adequate levels to promote tissue perfusion
- Monitor I/O to assess for adequate renal perfusion
- Monitor blood glucose and electrolytes

**Monitor for signs of renal/hepatic failure and bleeding disorders**
- Elevated BUN creatinine, liver function tests
- Monitor for coagulopathy; bleeding times

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<tr>
<th><strong>DO</strong></th>
<th><strong>CALL</strong></th>
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<tr>
<td>Administer IV antibiotics according to culture and sensitivity and monitor client’s response</td>
<td>Monitor for worsening infection, hemodynamic instability, and coagulopathy, renal or hepatic failure.</td>
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<tr>
<td>Administer IV fluid to ensure tissue perfusion and cellular hydration</td>
<td>If present Initiate shock management and call RRT and MD</td>
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<tr>
<td>Provide oxygen therapy to clients with respiratory distress</td>
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<tr>
<td>Administer antipyretics as prescribed for elevated temperature</td>
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<td>Prepare to administer IV vasopressor agents to maintain blood pressure and cardiac output</td>
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<td>Maintain euglycemia</td>
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<td>Correct electrolyte disturbances</td>
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