PNEUMONIA: MICROBIAL

Pneumonia is an inflammation of the lung parenchyma, associated with alveolar edema and congestion that impair gas exchange. Primary pneumonia is caused by the patient’s inhaling or aspirating a pathogen. Secondary pneumonia ensues from lung damage caused by the spread of bacteria from an infection elsewhere in the body. Likely causes include various infectious agents, chemical irritants (including gastric reflux/aspiration, smoke inhalation), and radiation therapy. This plan of care deals with bacterial and viral pneumonias, e.g., pneumococcal pneumonia, Pneumocystis carinii, Haemophilus influenzae, mycoplasma, and Gram-negative microbes.

CARE SETTING

Most patients are treated as outpatients; however, persons at higher risk (e.g., with ongoing/chronic health problems) are treated in the hospital, as are those already hospitalized for other reasons.

RELATED CONCERNS

AIDS
Chronic obstructive pulmonary disease (COPD) and asthma
Psychosocial aspects of care
Sepsis/septicemia
Surgical intervention

Patient Assessment Database

ACTIVITY/REST

May report: Fatigue, weakness
May exhibit: Insomnia

May report: Lethargy
May exhibit: Decreased tolerance to activity

CIRCULATION

May report: History of recent/chronic heart failure (HF)
May exhibit: Tachycardia

May exhibit: Flushed appearance or pallor

EGO INTEGRITY

May report: Multiple stressors, financial concerns

FOOD/FLUID

May report: Loss of appetite, nausea/vomiting
May exhibit: Distended abdomen

Hyperactive bowel sounds
Dry skin with poor turgor
Cachectic appearance (malnutrition)

NEUROSENSORY

May report: Frontal headache (influenza)
May exhibit: Changes in mentation (confusion, somnolence)

PAIN/DISCOMFORT

May report: Headache
Chest pain (pleuritic), aggravated by cough; substernal chest pain (influenza)
Myalgia, arthralgia

May exhibit: Splinting/guarding over affected area (patient commonly lies on affected side to restrict movement)
RESPIRATION

**May report:**
- History of recurrent/chronic URIs, tuberculosis or COPD, cigarette smoking
- Progressive dyspnea
- Cough: Dry hacking (initially) progressing to productive cough

**May exhibit:**
- Tachypnea; shallow grunting respirations, use of accessory muscles, nasal flaring
- Sputum: Scanty or copious; pink, rusty, or purulent (green, yellow, or white)
- Percussion: Dull over consolidated areas
- Fremitus: Tactile and vocal, gradually increases with consolidation
- Pleural friction rub
- Breath sounds: Diminished or absent over involved area, or bronchial breath sounds over area(s) of consolidation; coarse inspiratory crackles
- Color: Pallor or cyanosis of lips/nailbeds

SAFETY

**May report:**
- Recurrent chills
- History of altered immune system: i.e., systemic lupus erythematosus (SLE), AIDS, steroid or chemotherapy use, institutionalization, general debilitation
- Fever (e.g., 102°F–104°F/39°C–40°C)

**May exhibit:**
- Diaphoresis
- Shaking
- Rash may be noted in cases of rubeola or varicella

TEACHING/LEARNING

**May report:**
- History of recent surgery; chronic alcohol use; intravenous (IV) drug therapy or abuse; immunosuppressive therapy
- Discharge plan considerations:
  - DRG projected mean length of inpatient stay: 4.3–8.3 days
  - Assistance with self-care, homemaker tasks.
  - Oxygen may be needed, especially if recovery is prolonged or other predisposing condition exists.
  - Refer to section at end of plan for postdischarge considerations.

DIAGNOSTIC STUDIES

**Chest x-ray:** Identifies structural distribution (e.g., lobar, bronchial); may also reveal multiple abscesses/infiltrates, empyema (staphylococcus); scattered or localized infiltration (bacterial); or diffuse/extensive nodular infiltrates (more often viral). In mycoplasmal pneumonia, chest x-ray may be clear.

**Fiberoptic bronchoscopy:** May be both diagnostic (qualitative cultures) and therapeutic (re-expansion of lung segment).

**ABGs/pulse oximetry:** Abnormalities may be present, depending on extent of lung involvement and underlying lung disease.

**Gram stain/cultures:** Sputum collection; needle aspiration of empyema, pleural, and transtracheal or transthoracic fluids; lung biopsies and blood cultures may be done to recover causative organism. More than one type of organism may be present; common bacteria include Diplococcus pneumoniae, *Staphylococcus aureus*, a-hemolytic streptococcus, *Haemophilus influenzae*; cytomegalovirus (CMV). **Note:** Sputum cultures may not identify all offending organisms. Blood cultures may show transient bacteremia.

**CBC:** Leukocytosis usually present, although a low white blood cell (WBC) count may be present in viral infection, immunosuppressed conditions such as AIDS, and overwhelming bacterial pneumonia. Erythrocyte sedimentation rate (ESR) is elevated.

**Serologic studies, e.g., viral or Legionella titers, cold agglutinins:** Assist in differential diagnosis of specific organism.

**Pulmonary function studies:** Volumes may be decreased (congestion and alveolar collapse); airway pressure may be increased and compliance decreased. Shunting is present (hypoxemia).

**Electrolytes:** Sodium and chloride levels may be low.

**Bilirubin:** May be increased.

**Percutaneous aspiration/open biopsy of lung tissues:** May reveal typical intranuclear and cytoplasmic inclusions (CMV), characteristic giant cells (rubeola).

NURSING PRIORITIES
NURSING DIAGNOSIS: Airway Clearance, ineffective

May be related to
- Tracheal bronchial inflammation, edema formation, increased sputum production
- Pleuritic pain
- Decreased energy, fatigue

Possibly evidenced by
- Changes in rate, depth of respirations
- Abnormal breath sounds, use of accessory muscles
- Dyspnea, cyanosis
- Cough, effective or ineffective; with/without sputum production

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Respiratory Status: Airway Patency (NOC)
- Identify/demonstrate behaviors to achieve airway clearance.
- Display patent airway with breath sounds clearing; absence of dyspnea, cyanosis.

ACTIONS/INTERVENTIONS

Airway Management (NIC)

Independent

Assess rate/depth of respirations and chest movement.

Auscultate lung fields, noting areas of decreased/absent airflow and adventitious breath sounds, e.g., crackles, wheezes.

Elevate head of bed, change position frequently.

RATIONALE

Tachypnea, shallow respirations, and asymmetric chest movement are frequently present because of discomfort of moving chest wall and/or fluid in lung.

Decreased airflow occurs in areas consolidated with fluid. Bronchial breath sounds (normal over bronchus) can also occur in consolidated areas. Crackles, rhonchi, and wheezes are heard on inspiration and/or expiration in response to fluid accumulation, thick secretions, and airway spasm/obstruction.

Lowers diaphragm, promoting chest expansion, aeration of lung segments, mobilization and expectoration of secretions.
<table>
<thead>
<tr>
<th>ACTIONS/INTERVENTIONS</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Airway Management (NIC)</strong></td>
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</tr>
<tr>
<td><strong>Independent</strong></td>
<td><strong>Independent</strong></td>
</tr>
<tr>
<td>Assist patient with frequent deep-breathing exercises. Demonstrate/help patient learn to perform activity, e.g., splinting chest and effective coughing while in upright position.</td>
<td>Deep breathing facilitates maximum expansion of the lungs/smaller airways. Coughing is a natural self-cleaning mechanism, assisting the cilia to maintain patent airways. Splinting reduces chest discomfort, and an upright position favors deeper, more forceful cough effort.</td>
</tr>
<tr>
<td>Suction as indicated (e.g., frequent or sustained cough, adventitious breath sounds, desaturation related to airway secretions).</td>
<td>Stimulates cough or mechanically clears airway in patient who is unable to do so because of ineffective cough or decreased level of consciousness.</td>
</tr>
<tr>
<td>Force fluids to at least 3000 mL/day (unless contraindicated, as in heart failure). Offer warm, rather than cold, fluids.</td>
<td>Fluids (especially warm liquids) aid in mobilization and expectoration of secretions.</td>
</tr>
<tr>
<td><strong>Collaborative</strong></td>
<td><strong>Collaborative</strong></td>
</tr>
<tr>
<td>Assist with/monitor effects of nebulizer treatments and other respiratory physiotherapy, e.g., incentive spirometer, IPPB, percussion, postural drainage. Perform treatments between meals and limit fluids when appropriate.</td>
<td>Facilitates liquefaction and removal of secretions. Postural drainage may not be effective in interstitial pneumonias or those causing alveolar exudate/destruction. Coordination of treatments/schedules and oral intake reduces likelihood of vomiting with coughing, expectorations.</td>
</tr>
<tr>
<td>Administer medications as indicated: mucolytics, expectorants, bronchodilators, analgesics.</td>
<td>Aids in reduction of bronchospasm and mobilization of secretions. Analgesics are given to improve cough effort by reducing discomfort, but should be used cautiously because they can decrease cough effort/depress respirations.</td>
</tr>
<tr>
<td>Provide supplemental fluids, e.g., IV, humidified oxygen, and room humidification.</td>
<td>Fluids are required to replace losses (including insensible) and aid in mobilization of secretions. Note: Some studies indicate that room humidification has been found to provide minimal benefit and is thought to increase the risk of transmitting infection.</td>
</tr>
<tr>
<td>Monitor serial chest x-rays, ABGs, pulse oximetry readings. (Refer to ND: Gas Exchange, impaired, following.)</td>
<td>Follows progress and effects of disease process/therapeutic regimen, and facilitates necessary alterations in therapy.</td>
</tr>
<tr>
<td>Assist with bronchoscopy/thoracentesis, if indicated.</td>
<td>Occasionally needed to remove mucous plugs, drain purulent secretions, and/or prevent atelectasis.</td>
</tr>
</tbody>
</table>
**NURSING DIAGNOSIS: Gas Exchange, impaired**

**May be related to**
- Alveolar-capillary membrane changes (inflammatory effects)
- Altered oxygen-carrying capacity of blood/release at cellular level (fever, shifting oxyhemoglobin curve)
- Altered delivery of oxygen (hypoventilation)

**Possibly evidenced by**
- Dyspnea, cyanosis
- Tachycardia
- Restlessness/changes in mentation
- Hypoxia

**DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:**

**Respiratory Status: Gas Exchange (NOC)**
Demonstrate improved ventilation and oxygenation of tissues by ABGs within patient’s acceptable range and absence of symptoms of respiratory distress.
Participate in actions to maximize oxygenation.

<table>
<thead>
<tr>
<th>ACTIONS/INTERVENTIONS</th>
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</tr>
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<tbody>
<tr>
<td><strong>Respiratory Monitoring (NIC)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td></td>
</tr>
<tr>
<td>Assess respiratory rate, depth, and ease.</td>
<td>Manifestations of respiratory distress are dependent on/and indicative of the degree of lung involvement and underlying general health status.</td>
</tr>
<tr>
<td>Observe color of skin, mucous membranes, and nailbeds, noting presence of peripheral cyanosis (nailbeds) or central cyanosis (circumoral).</td>
<td>Cyanosis of nailbeds may represent vasoconstriction or the body’s response to fever/chills; however, cyanosis of earlobes, mucous membranes, and skin around the mouth (“warm membranes”) is indicative of systemic hypoxemia.</td>
</tr>
<tr>
<td>Assess mental status.</td>
<td>Restlessness, irritation, confusion, and somnolence may reflect hypoxemia/ decreased cerebral oxygenation.</td>
</tr>
<tr>
<td>Monitor heart rate/rhythm.</td>
<td>Tachycardia is usually present as a result of fever/dehydration but may represent a response to hypoxemia.</td>
</tr>
<tr>
<td>Monitor body temperature, as indicated. Assist with comfort measures to reduce fever and chills, e.g., addition/removal of bedcovers, comfortable room temperature, tepid or cool water sponge bath.</td>
<td>High fever (common in bacterial pneumonia and influenza) greatly increases metabolic demands and oxygen consumption and alters cellular oxygenation.</td>
</tr>
<tr>
<td>Maintain bedrest. Encourage use of relaxation techniques and diversional activities.</td>
<td>Prevents overexhaustion and reduces oxygen consumption/demands to facilitate resolution of infection.</td>
</tr>
</tbody>
</table>
### ACTIONS/INTERVENTIONS

#### Respiratory Monitoring (NIC)

**Independent**

- Elevate head and encourage frequent position changes, deep breathing, and effective coughing.

- Assess level of anxiety. Encourage verbalization of concerns/feelings. Answer questions honestly. Visit frequently, arrange for SO/visitors to stay with patient as indicated.

- Observe for deterioration in condition, noting hypotension, copious amounts of pink/bloody sputum, pallor, cyanosis, change in level of consciousness, severe dyspnea, restlessness.

**Collaborative**

- Monitor ABGs, pulse oximetry.

**Oxygen Therapy (NIC)**

- Administer oxygen therapy by appropriate means, e.g., nasal prongs, mask, Venturi mask.

- Prepare for/transfer to critical care setting if indicated.

### RATIONALE

These measures promote maximal inspiration, enhance expectoration of secretions to improve ventilation. (Refer to ND: Airway Clearance, ineffective.)

Anxiety is a manifestation of psychological concerns and physiological responses to hypoxia. Providing reassurance and enhancing sense of security can reduce the psychological component, thereby decreasing oxygen demand and adverse physiological responses.

Shock and pulmonary edema are the most common causes of death in pneumonia and require immediate medical intervention.

The purpose of oxygen therapy is to maintain $\text{PaO}_2$ above 60 mm Hg. Oxygen is administered by the method that provides appropriate delivery within the patient’s tolerance.

Intubation and mechanical ventilation may be required in the event of severe respiratory insufficiency. (Refer to CP: Mechanical Ventilation.)

### NURSING DIAGNOSIS: Infection, risk for [spread]

**Risk factors may include**

- Inadequate primary defenses (decreased ciliary action, stasis of respiratory secretions)
- Inadequate secondary defenses (presence of existing infection, immunosuppression), chronic disease, malnutrition

**Possibly evidenced by**

[Not applicable; presence of signs and symptoms establishes an *actual* diagnosis.]

### DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

**Infection Status (NOC)**

Achieve timely resolution of current infection without complications.

**Knowledge: Infection Control (NOC)**

Identify interventions to prevent/reduce risk/spread of/secondary infection.
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Infection Control (NIC)</strong></td>
<td>During this period of time, potentially fatal complications (hypotension/shock) may develop.</td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td>Although patient may find expectoration offensive and attempt to limit or avoid it, it is essential that sputum be disposed of in a safe manner. Changes in characteristics of sputum reflect resolution of pneumonia or development of secondary infection.</td>
</tr>
<tr>
<td>Monitor vital signs closely, especially during initiation of therapy.</td>
<td>Effective means of reducing spread or acquisition of infection.</td>
</tr>
<tr>
<td>Instruct patient concerning the disposition of secretions (e.g., raising and expectorating versus swallowing) and reporting changes in color, amount, odor of secretions.</td>
<td>Promotes expectoration, clearing of infection.</td>
</tr>
<tr>
<td>Demonstrate/encourage good handwashing technique.</td>
<td>Reduces likelihood of exposure to other infectious pathogens.</td>
</tr>
<tr>
<td>Change position frequently and provide good pulmonary toilet.</td>
<td>Dependent on type of infection, response to antibiotics, patient’s general health, and development of complications, isolation techniques may be desired to prevent spread/protect patient from other infectious processes.</td>
</tr>
<tr>
<td>Limit visitors as indicated.</td>
<td>Facilitates healing process and enhances natural resistance.</td>
</tr>
<tr>
<td>Institute isolation precautions as individually appropriate.</td>
<td>Signs of improvement in condition should occur within 24–48 hr.</td>
</tr>
<tr>
<td>Encourage adequate rest balanced with moderate activity. Promote adequate nutritional intake.</td>
<td>Delayed recovery or increase in severity of symptoms suggests resistance to antibiotics or secondary infection. Complications affecting any/all organ systems include lung abscess/empyema, bacteremia, pericarditis/endocarditis, meningitis/encephalitis, and superinfections.</td>
</tr>
<tr>
<td>Monitor effectiveness of antimicrobial therapy.</td>
<td>These drugs are used to combat most of the microbial pneumonias. Combinations of antiviral and antifungal agents may be used when the pneumonia is a result of mixed organisms. Note: Vancomycin and third-generation cephalosporins are the treatment of choice for penicillin-resistant streptococcal pneumonia.</td>
</tr>
<tr>
<td>Investigate sudden changes/deterioration in condition, such as increasing chest pain, extra heart sounds, altered sensorium, recurring fever, changes in sputum characteristics.</td>
<td></td>
</tr>
<tr>
<td><strong>Collaborative</strong></td>
<td></td>
</tr>
<tr>
<td>Administer antimicrobials as indicated by results of sputum/blood cultures: e.g., penicillins: erythromycin (E-Mycin), tetracycline (Achromycin), doxycycline hyclate (Vibramycin), amikacin (Amikin); cephalosporins: ceftriaxone (Rocephin); amantadine (Symmetrel); sparfloxacin (Zagam); macrolide derivatives, e.g, azithromycin (Zithromax).</td>
<td></td>
</tr>
</tbody>
</table>
### ACTIONS/INTERVENTIONS

#### Infection Control (NIC)

**Collaborative**

Prepare for/assist with diagnostic studies as indicated.

---

#### RATIONALE

Fiberoptic bronchoscopy (FOB) may be done in patients who do not respond rapidly (within 1–3 days) to antimicrobial therapy to clarify diagnosis and therapy needs.

---

### NURSING DIAGNOSIS: Activity intolerance

**May be related to**

- Imbalance between oxygen supply and demand
- General weakness
- Exhaustion associated with interruption in usual sleep pattern because of discomfort, excessive coughing, and dyspnea

**Possibly evidenced by**

- Verbal reports of weakness, fatigue, exhaustion
- Exertional dyspnea, tachypnea
- Tachycardia in response to activity
- Development/worsening of pallor/cyanosis

---

### DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

#### Activity Tolerance (NOC)

Report/demonstrate a measurable increase in tolerance to activity with absence of dyspnea and excessive fatigue, and vital signs within patient’s acceptable range.

---

### ACTIONS/INTERVENTIONS

#### Energy Management (NIC)

**Independent**

Evaluate patient’s response to activity. Note reports of dyspnea, increased weakness/fatigue, and changes in vital signs during and after activities.

Provide a quiet environment and limit visitors during acute phase as indicated. Encourage use of stress management and diversional activities as appropriate.

Explain importance of rest in treatment plan and necessity for balancing activities with rest.

---

#### RATIONALE

- Establishes patient’s capabilities/needs and facilitates choice of interventions.
- Reduces stress and excess stimulation, promoting rest.
- Bedrest is maintained during acute phase to decrease metabolic demands, thus conserving energy for healing. Activity restrictions thereafter are determined by individual patient response to activity and resolution of respiratory insufficiency.
**ACTIONS/INTERVENTIONS**

**Energy Management (NIC)**
**Independent**

- Assist patient to assume comfortable position for rest/sleep.
- Assist with self-care activities as necessary. Provide for progressive increase in activities during recovery phase.

**RATIONALE**

- Patient may be comfortable with head of bed elevated, sleeping in a chair, or leaning forward on overbed table with pillow support.
- Minimizes exhaustion and helps balance oxygen supply and demand.

---

**NURSING DIAGNOSIS: Pain, acute**  
**May be related to**  
Inflammation of lung parenchyma  
Cellular reactions to circulating toxins  
Persistent coughing  
**Possibly evidenced by**  
Reports of pleuritic chest pain, headache, muscle/joint pain  
Guarding of affected area  
Distraction behaviors, restlessness  

**DESired OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:**  
**Pain: Disruptive Effects (NOC)**  
Verbalize relief/control of pain.  
Demonstrate relaxed manner, resting/sleeping and engaging in activity appropriately.

---

**ACTIONS/INTERVENTIONS**

**Pain Management (NIC)**
**Independent**

- Determine pain characteristics, e.g., sharp, constant, stabbing. Investigate changes in character/location/intensity of pain.
- Monitor vital signs.
- Provide comfort measures, e.g., back rubs, change of position, quiet music or conversation. Encourage use of relaxation/breathing exercises.

**RATIONALE**

- Chest pain, usually present to some degree with pneumonia, may also herald the onset of complications of pneumonia, such as pericarditis and endocarditis.
- Changes in heart rate or BP may indicate that patient is experiencing pain, especially when other reasons for changes in vital signs have been ruled out.
- Nonanalgesic measures administered with a gentle touch can lessen discomfort and augment therapeutic effects of analgesics. Patient involvement in pain control measures promotes independence and enhances sense of well-being.
### ACTIONS/INTERVENTIONS

**Pain Management (NIC)**

**Independent**
- Offer frequent oral hygiene.
- Instruct and assist patient in chest splinting techniques during coughing episodes. (Refer to ND: Airway Clearance, ineffective.)

**Collaborative**
- Administer analgesics and antitussives as indicated.

### RATIONALE

Mouth breathing and oxygen therapy can irritate and dry out mucous membranes, potentiating general discomfort.

Aids in control of chest discomfort while enhancing effectiveness of cough effort.

These medications may be used to suppress nonproductive/paroxysmal cough or reduce excess mucus, thereby enhancing general comfort/rest.

### NURSING DIAGNOSIS: Nutrition: imbalanced, risk for less than body requirements

**Risk factors may include**
- Increased metabolic needs secondary to fever and infectious process
- Anorexia associated with bacterial toxins, the odor and taste of sputum, and certain aerosol treatments
- Abdominal distension/gas associated with swallowing air during dyspneic episodes

**Possibly evidenced by**
[Not applicable; presence of signs and symptoms establishes an actual diagnosis.]

### DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

**Nutritional Status (NOC)**
- Demonstrate increased appetite.
- Maintain/regain desired body weight.

### ACTIONS/INTERVENTIONS

**Nutrition Therapy (NIC)**

**Independent**
- Identify factors that are contributing to nausea/vomiting, e.g., copious sputum, aerosol treatments, severe dyspnea, pain.

### RATIONALE

Choice of interventions depends on the underlying cause of the problem.
<table>
<thead>
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<tr>
<td><strong>Nutrition Therapy (NIC)</strong></td>
<td><strong>Eliminates noxious sights, tastes, smells from the patient environment and can reduce nausea.</strong></td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td><strong>Reduces effects of nausea associated with these treatments.</strong></td>
</tr>
<tr>
<td>Provide covered container for sputum and remove at frequent intervals. Assist with/encourage oral hygiene after emesis, after aerosol and postural drainage treatments, and before meals.</td>
<td><strong>Bowel sounds may be diminished/absent if the infectious process is severe/prolonged. Abdominal distension may occur as a result of air swallowing or reflect the influence of bacterial toxins on the gastrointestinal (GI) tract.</strong></td>
</tr>
<tr>
<td>Schedule respiratory treatments at least 1 hr before meals.</td>
<td><strong>These measures may enhance intake even though appetite may be slow to return.</strong></td>
</tr>
<tr>
<td>Auscultate for bowel sounds. Observe/palpate for abdominal distension.</td>
<td><strong>Presence of chronic conditions (e.g., COPD or alcoholism) or financial limitations can contribute to malnutrition, lowered resistance to infection, and/or delayed response to therapy.</strong></td>
</tr>
<tr>
<td>Provide small, frequent meals, including dry foods (toast, crackers) and/or foods that are appealing to patient.</td>
<td><strong>Evaluates general nutritional state, obtain baseline weight.</strong></td>
</tr>
</tbody>
</table>

**NURSING DIAGNOSIS: Fluid Volume, risk for deficient**

**Risk factors may include**
- Excessive fluid loss (fever, profuse diaphoresis, mouth breathing/hyperventilation, vomiting)
- Decreased oral intake

**Possibly evidenced by**
- [Not applicable; presence of signs and symptoms establishes an actual diagnosis.]

**DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:**

**Fluid Balance (NOC)**
- Demonstrate fluid balance evidenced by individually appropriate parameters, e.g., moist mucous membranes, good skin turgor, prompt capillary refill, stable vital signs.

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<tr>
<td><strong>Fluid Management (NIC)</strong></td>
<td><strong>Elevated temperature/prolonged fever increases metabolic rate and fluid loss through evaporation. Orthostatic BP changes and increasing tachycardia may indicate systemic fluid deficit.</strong></td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td></td>
</tr>
</tbody>
</table>
### ACTIONS/INTERVENTIONS

#### Fluid Management (NIC)

**Independent**

- Assess skin turgor, moisture of mucous membranes (lips, tongue).
- Note reports of nausea/vomiting.
- Force fluids to at least 3000 mL/day or as individually appropriate.

**Collaborative**

- Administer medications as indicated, e.g., antipyretics, antiemetics.
- Provide supplemental IV fluids as necessary.

### RATIONALE

- Indirect indicators of adequacy of fluid volume, although oral mucous membranes may be dry because of mouth breathing and supplemental oxygen.
- Presence of these symptoms reduces oral intake.
- Provides information about adequacy of fluid volume and replacement needs.
- Meets basic fluid needs, reducing risk of dehydration.
- Useful in reducing fluid losses.
- In presence of reduced intake/excessive loss, use of parenteral route may correct/prevent deficiency.

### NURSING DIAGNOSIS: Knowledge, deficient [Learning Need] regarding condition, treatment, self-care, and discharge needs

**May be related to**
- Lack of exposure
- Misinterpretation of information
- Altered recall

**Possibly evidenced by**
- Requests for information; statement of misconception
- Failure to improve/recurrence

**DESired Outcomes/Evaluation Criteria—Patient Will:**

**Knowledge: Illness Care (NOC)**
- Verbalize understanding of condition, disease process, and prognosis.
- Verbalize understanding of therapeutic regimen.
- Initiate necessary lifestyle changes.
- Participate in treatment program.
<table>
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<tbody>
<tr>
<td><strong>Teaching: Disease Process (NIC)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Independent</strong></td>
<td></td>
</tr>
<tr>
<td>Review normal lung function, pathology of condition.</td>
<td>Promotes understanding of current situation and importance of cooperating with treatment regimen.</td>
</tr>
<tr>
<td>Discuss debilitating aspects of disease, length of convalescence, and recovery expectations. Identify self-care and homemaker needs/resources.</td>
<td>Information can enhance coping and help reduce anxiety and excessive concern. Respiratory symptoms may be slow to resolve, and fatigue and weakness can persist for an extended period. These factors may be associated with depression and the need for various forms of support and assistance.</td>
</tr>
<tr>
<td>Provide information in written and verbal form.</td>
<td>Fatigue and depression can affect ability to assimilate information/follow medical regimen.</td>
</tr>
<tr>
<td>Stress importance of continuing effective coughing/deep-breathing exercises.</td>
<td>During initial 6–8 wk after discharge, patient is at greatest risk for recurrence of pneumonia.</td>
</tr>
<tr>
<td>Emphasize necessity for continuing antibiotic therapy for prescribed period.</td>
<td>Early discontinuation of antibiotics may result in failure to completely resolve infectious process.</td>
</tr>
<tr>
<td>Review importance of cessation of smoking.</td>
<td>Smoking destroys tracheobronchial ciliary action, irritates bronchial mucosa, and inhibits alveolar macrophages, compromising body’s natural defense against infection.</td>
</tr>
<tr>
<td>Outline steps to enhance general health and well-being, e.g., balanced rest and activity, well-rounded diet, avoidance of crowds during cold/flu season and persons with URIs.</td>
<td>Increases natural defenses/immunity, limits exposure to pathogens.</td>
</tr>
<tr>
<td>Stress importance of continuing medical follow-up and obtaining vaccinations/immunizations as appropriate.</td>
<td>May prevent recurrence of pneumonia and/or related complications.</td>
</tr>
<tr>
<td>Identify signs/symptoms requiring notification of healthcare provider, e.g., increasing dyspnea, chest pain, prolonged fatigue, weight loss, fever/chills, persistence of productive cough, changes in mentation.</td>
<td>Prompt evaluation and timely intervention may prevent/minimize complications.</td>
</tr>
</tbody>
</table>

**POTENTIAL CONSIDERATIONS following acute hospitalization (dependent on patient’s age, physical condition/presence of complications, personal resources, and life responsibilities)**

- Fatigue—increased energy requirements to perform ADLs, discomfort, effects of antimicrobial therapy.
- Infection, risk for—ineffective secondary response (e.g., leukopenia, suppressed inflammatory response), chronic disease, malnutrition, current use of antibiotics.
- Therapeutic Regimen: ineffective management—complexity of therapeutic regimen, economic difficulties, perceived seriousness/susceptibility.