

PULMONARY TUBERCULOSIS (TB)

Although many still believe it to be a problem of the past, pulmonary tuberculosis (TB) is on the rise. Most frequently seen as a pulmonary disease, TB can be extrapulmonary and affect organs and tissues other than the lungs. In the United States, incidence is higher among the homeless, drug-addicted, and impoverished populations, as well as among immigrants from or visitors to countries in which TB is endemic. In addition, persons at highest risk include those who may have been exposed to the bacillus in the past and those who are debilitated or have lowered immunity because of chronic conditions such as AIDS, cancer, advanced age, and malnutrition. When the immune system weakens, dormant TB organisms can reactivate and multiply. When this latent infection develops into active disease, it is known as reactivation TB, which is often drug resistant. Multidrug-resistant tuberculosis (MDR-TB) is also on the rise, especially in large cities, in those previously treated with antitubercular drugs, or in those who failed to follow or complete a drug regimen. It can progress from diagnosis to death in as little as 4–6 weeks. MDR tuberculosis can be primary or secondary. Primary is caused by person-to-person transmission of a drug-resistant organism; secondary is usually the result of nonadherence to therapy or inappropriate treatment.

CARE SETTING

Most patients are treated as outpatients, but may be hospitalized for diagnostic evaluation/initiation of therapy, adverse drug reactions, or severe illness/debilitation.

RELATED CONCERNS

Extended care
Pneumonia: microbial
Psychosocial aspects of care

Patient Assessment Database

Data depend on stage of disease and degree of involvement.

ACTIVITY/REST

May report: Generalized weakness and fatigue
Shortness of breath with exertion
Difficulty sleeping, with evening or night fever, chills, and/or sweats
Nightmares

May exhibit: Tachycardia, tachypnea/dyspnea on exertion
Muscle wasting, pain, and stiffness (advanced stages)

EGO INTEGRITY

May report: Recent/long-standing stress factors
Financial concerns, poverty
Feelings of helplessness/hopelessness
Cultural/ethnic populations: Native-American or recent immigrants from Central America, Southeast Asia, Indian subcontinent

May exhibit: Denial (especially during early stages)
Anxiety, apprehension, irritability

FOOD/FLUID

May report: Loss of appetite
Indigestion
Weight loss

May exhibit: Poor skin turgor, dry/flaky skin
Muscle wasting/loss of subcutaneous fat

PAIN/DISCOMFORT

May report: Chest pain aggravated by recurrent cough

May exhibit: Guarding of affected area
Distraction behaviors, restlessness

RESPIRATION

May report: Cough, productive or nonproductive
Shortness of breath
History of tuberculosis/exposure to infected individual

May exhibit: Increased respiratory rate (extensive disease or fibrosis of the lung parenchyma and pleura)
Asymmetry in respiratory excursion (pleural effusion)
Dullness to percussion and decreased fremitus (pleural fluid or pleural thickening)
Breath sounds diminished/absent bilaterally or unilaterally (pleural effusion/pneumothorax); tubular breath sounds and/or whispered pectoriloquies over large lesions; crackles may be noted over apex of lungs during quick inspiration after a short cough (posttussive crackles)
Sputum characteristics green/purulent, yellowish mucoid, or blood-tinged
Tracheal deviation (bronchogenic spread)
Inattention, marked irritability, change in mentation (advanced stages)

SAFETY

May report: Presence of immunosuppressed conditions, e.g., AIDS, cancer
Positive HIV test/HIV infection
Visit to/immigration from or close contact with persons in countries with high prevalence of TB (e.g., Philippines, Vietnam, Cambodia, Laos, Puerto Rico, Haiti, Russia, Mexico)

May exhibit: Low-grade fever or acute febrile illness

SOCIAL INTERACTION

May report: Feelings of isolation/rejection because of communicable disease
Change in usual patterns of responsibility/change in physical capacity to resume role

TEACHING/LEARNING

May report: Familial history of TB
General debilitation/poor health status
Use/abuse of substances such as IV drugs, alcohol, cocaine, and crack
Failure to improve/reactivation of TB
Nonparticipation in therapy

Discharge plan considerations: **DRG projected mean length of inpatient stay: 6.3–8.3 days**
May require assistance with/alteration in drug therapy and temporary assistance in self-care and homemaker/maintenance tasks
Refer to section at end of plan for postdischarge considerations.

DIAGNOSTIC STUDIES

Sputum culture: Positive for *Mycobacterium tuberculosis* in the active stage of the disease.

Ziehl-Neelsen (acid-fast stain applied to a smear of body fluid): Positive for acid-fast bacilli (AFB).

Skin tests (purified protein derivative [PPD] or Old tuberculin [OT] administered by intradermal injection [Mantoux]): A positive reaction (area of induration 10 mm or greater, occurring 48–72 hr after intradermal injection of the antigen) indicates past infection and the presence of antibodies but is not necessarily indicative of active disease. Factors associated with a decreased response to tuberculin include underlying viral or bacterial infection, malnutrition, lymphadenopathy, overwhelming TB infection, insufficient antigen injection, and conscious or unconscious bias. A significant reaction in a patient who is clinically ill means that active TB cannot be dismissed as a diagnostic possibility. A significant reaction in healthy persons usually signifies dormant TB or an infection caused by a different mycobacterium.

Enzyme-linked immunosorbent assay (ELISA)/Western blot: May reveal presence of HIV.

Chest x-ray: May show small, patchy infiltrations of early lesions in the upper-lung field, calcium deposits of healed primary lesions, or fluid of an effusion. Changes indicating more advanced TB may include cavitation, scar tissue/fibrotic areas.

CT or MRI scan: Determines degree of lung damage and may confirm a difficult diagnosis.

Bronchoscopy: Shows inflammation and altered lung tissue. May also be performed to obtain sputum if patient is unable to produce an adequate specimen.

Histologic or tissue cultures (including gastric washings; urine and cerebrospinal fluid [CSF]; skin biopsy): Positive for *Mycobacterium tuberculosis* and may indicate extrapulmonary involvement.

Needle biopsy of lung tissue: Positive for granulomas of TB; presence of giant cells indicating necrosis.

Electrolytes: May be abnormal depending on the location and severity of infection; e.g., hyponatremia caused by abnormal water retention may be found in extensive chronic pulmonary TB.

ABGs: May be abnormal depending on location, severity, and residual damage to the lungs.

Pulmonary function studies: Decreased vital capacity, increased dead space, increased ratio of residual air to total lung capacity, and decreased oxygen saturation are secondary to parenchymal infiltration/fibrosis, loss of lung tissue, and pleural disease (extensive chronic pulmonary TB).

NURSING PRIORITIES

1. Achieve/maintain adequate ventilation/oxygenation.
2. Prevent spread of infection.
3. Support behaviors/tasks to maintain health.
4. Promote effective coping strategies.
5. Provide information about disease process/prognosis and treatment needs.

DISCHARGE GOALS

1. Respiratory function adequate to meet individual need.
2. Complications prevented.
3. Lifestyle/behavior changes adopted to prevent spread of infection.
4. Disease process/prognosis and therapeutic regimen understood.
5. Plan in place to meet needs after discharge.

NURSING DIAGNOSIS: Infection, risk for [spread/reactivation]

Risk factors may include

Inadequate primary defenses, decreased ciliary action/stasis of secretions

Tissue destruction/extension of infection

Lowered resistance/suppressed inflammatory process

Malnutrition

Environmental exposure

Insufficient knowledge to avoid exposure to pathogens

Possibly evidenced by

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

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Risk Control (NOC)

Identify interventions to prevent/reduce risk of spread of infection.

Demonstrate techniques/initiate lifestyle changes to promote safe environment.

ACTIONS/INTERVENTIONS

RATIONALE

<p>Infection Control (NIC)</p> <p>Independent</p> <p>Review pathology of disease (active/inactive phases; dissemination of infection through bronchi to adjacent tissues or via bloodstream/lymphatic system) and potential spread of infection via airborne droplet during coughing, sneezing, spitting, talking, laughing, singing.</p> <p>Identify others at risk, e.g., household members, close associates/friends.</p> <p>Instruct patient to cough/sneeze and expectorate into tissue and to refrain from spitting. Review proper disposal of tissue and good handwashing techniques. Encourage return demonstration.</p> <p>Review necessity of infection control measures, e.g., temporary respiratory isolation.</p> <p>Monitor temperature as indicated.</p> <p>Identify individual risk factors for reactivation of tuberculosis, e.g., lowered resistance associated with alcoholism, malnutrition/intestinal bypass surgery; use of immunosuppression drugs/corticosteroids; presence of diabetes mellitus, cancer; postpartum.</p> <p>Stress importance of uninterrupted drug therapy. Evaluate patient's potential for cooperation.</p> <p>Review importance of follow-up and periodic reculturing of sputum for the duration of therapy.</p> <p>Encourage selection/ingestion of well-balanced meals. Provide frequent small "snacks" in place of large meals as appropriate.</p>	<p>Helps patient realize/accept necessity of adhering to medication regimen to prevent reactivation/complication. Understanding of how the disease is passed and awareness of transmission possibilities help patient/SO take steps to prevent infection of others.</p> <p>Those exposed may require a course of drug therapy to prevent spread/ development of infection.</p> <p>Behaviors necessary to prevent spread of infection.</p> <p>May help patient understand need for protecting others while acknowledging patient's sense of isolation and social stigma associated with communicable diseases. <i>Note:</i> AFB can pass through standard masks; therefore, particulate respirators are required.</p> <p>Febrile reactions are indicators of continuing presence of infection.</p> <p>Knowledge about these factors helps patient alter lifestyle and avoid/reduce incidence of exacerbation.</p> <p>Contagious period may last only 2–3 days after initiation of chemotherapy, but in presence of cavitation or moderately advanced disease, risk of spread of infection may continue up to 3 months. Compliance with multidrug regimens for prolonged periods is difficult, so directly observed therapy (DOT) should be considered.</p> <p>Aids in monitoring the effects of medications and patient's response to therapy.</p> <p>Presence of anorexia and/or preexisting malnutrition lowers resistance to infectious process and impairs healing. Small snacks may enhance overall intake.</p>
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ACTIONS/INTERVENTIONS	RATIONALE
<p>Infection Control (NIC)</p> <p>Collaborative</p> <p>Administer anti-infective agents as indicated, e.g.:</p> <p>Primary drugs: isoniazid (INH), ethambutol (Myambutol), rifampin (RMP/Rifadin), rifampin with isoniazid (Rifamate), pyrazinamide (PZA), streptomycin, rifapentine (Priftin);</p> <p>Second-line drugs: e.g., ethionamide (Trecator-SC), para-aminosalicylate (PAS), cycloserine (Seromycin), capreomycin (Capastat).</p> <p>Monitor laboratory studies, e.g., sputum smear results;</p> <p>Liver function studies, e. g., AST/ALT.</p> <p>Notify local health department.</p>	<p>Initial therapy of uncomplicated pulmonary disease usually includes four drugs, e.g., four primary drugs or combination of primary and secondary drugs. INH is usually drug of choice for infected patient and those at risk for developing TB. Short-course chemotherapy, including INH, rifampin (for 6 mo), PZA, and ethambutol or streptomycin, is given for at least 2 mo (or until sensitivities are known or until serial sputums are clear) followed by 3 more months of therapy with INH. Ethambutol should be given if central nervous system (CNS) or disseminated disease is present or if INH resistance is suspected. Extended therapy (up to 24 mo) is indicated for reactivation cases, extrapulmonary reactivated TB, or in the presence of other medical problems, such as diabetes mellitus or silicosis. Prophylaxis with INH for 12 mo should be considered in HIV-positive patients with positive PPD test.</p> <p>These second-line drugs may be required when infection is resistant to or intolerant of primary drugs or may be used concurrently with primary antitubercular drugs. <i>Note:</i> MDR-TB requires minimum of 18–24 mo therapy with at least three drugs in the regimen known to be effective against the specific infective organism and which patient has not previously taken. Treatment is often extended to 24 mo in patients with severe symptoms/HIV infection.</p> <p>Patient who has three consecutive negative sputum smears (takes 3–5 mo), is adhering to drug regimen, and is asymptomatic will be classified a nontransmitter.</p> <p>Adverse effects of drug therapy include hepatitis.</p> <p>Helpful in identifying contacts to reduce spread of infection and is required by law. Treatment course is long and usually handled in the community with public health nurse monitoring.</p>

NURSING DIAGNOSIS: Airway Clearance, ineffective

May be related to

Thick, viscous, or bloody secretions
Fatigue, poor cough effort
Tracheal/pharyngeal edema

Possibly evidenced by

Abnormal respiratory rate, rhythm, depth
Abnormal breath sounds (rhonchi, wheezes), stridor
Dyspnea

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Respiratory Status: Airway Patency (NOC)

Maintain patent airway.
Expectorate secretions without assistance.
Demonstrate behaviors to improve/maintain airway clearance.
Participate in treatment regimen, within the level of ability/situation.
Identify potential complications and initiate appropriate actions.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Airway Management (NIC)</p> <p>Independent</p> <p>Assess respiratory function, e.g., breath sounds, rate, rhythm, and depth, and use of accessory muscles.</p> <p>Note ability to expectorate mucus/cough effectively; document character, amount of sputum, presence of hemoptysis.</p> <p>Place patient in semi- or high-Fowler's position. Assist patient with coughing and deep-breathing exercises.</p> <p>Clear secretions from mouth and trachea; suction as necessary.</p> <p>Maintain fluid intake of at least 2500 mL/day unless contraindicated.</p> <p>Collaborative</p> <p>Humidify inspired air/oxygen.</p>	<p>Diminished breath sounds may reflect atelectasis. Rhonchi, wheezes indicate accumulation of secretions/inability to clear airways that may lead to use of accessory muscles and increased work of breathing.</p> <p>Expectoration may be difficult when secretions are very thick as a result of infection and/or inadequate hydration. Blood-tinged or frankly bloody sputum results from tissue breakdown (cavitation) in the lungs or from bronchial ulceration and may require further evaluation/intervention.</p> <p>Positioning helps maximize lung expansion and decreases respiratory effort. Maximal ventilation may open atelectatic areas and promote movement of secretions into larger airways for expectoration.</p> <p>Prevents obstruction/aspiration. Suctioning may be necessary if patient is unable to expectorate secretions.</p> <p>High fluid intake helps thin secretions, making them easier to expectorate.</p> <p>Prevents drying of mucous membranes; helps thin secretions.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Airway Management (NIC)</p> <p>Collaborative</p> <p>Administer medications as indicated:</p> <ul style="list-style-type: none"> Mucolytic agents, e.g., acetylcysteine (Mucomyst); Bronchodilators, e.g., oxtriphylline (Choledyl), theophylline (Theo-Dur); Corticosteroids (prednisone). <p>Be prepared for/assist with emergency intubation.</p>	<p>Reduces the thickness and stickiness of pulmonary secretions to facilitate clearance.</p> <p>Increases lumen size of the tracheobronchial tree, thus decreasing resistance to airflow and improving oxygen delivery.</p> <p>May be useful in presence of extensive involvement with profound hypoxemia and when inflammatory response is life-threatening.</p> <p>Intubation may be necessary in rare cases of bronchogenic TB accompanied by laryngeal edema or acute pulmonary bleeding.</p>

<p>NURSING DIAGNOSIS: Gas Exchange, risk for impaired</p> <p>Risk factors may include</p> <ul style="list-style-type: none"> Decrease in effective lung surface, atelectasis Destruction of alveolar-capillary membrane Thick, viscous secretions Bronchial edema <p>Possibly evidenced by</p> <p>[Not applicable; presence of signs and symptoms establishes an <i>actual</i> diagnosis.]</p> <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Respiratory Status: Gas Exchange (NOC)</p> <ul style="list-style-type: none"> Report absence of/decreased dyspnea. Demonstrate improved ventilation and adequate oxygenation of tissues by ABGs within acceptable ranges. Be free of symptoms of respiratory distress.
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ACTIONS/INTERVENTIONS	RATIONALE
<p>Respiratory Monitoring (NIC)</p> <p>Independent</p> <p>Assess for dyspnea (using 0–10 scale), tachypnea, abnormal/diminished breath sounds, increased respiratory effort, limited chest wall expansion, and fatigue.</p> <p>Evaluate change in level of mentation. Note cyanosis and/or change in skin color, including mucous membranes and nailbeds.</p> <p>Demonstrate/encourage pursed-lip breathing during exhalation, especially for patients with fibrosis or parenchymal destruction.</p> <p>Promote bedrest/limit activity and assist with self-care activities as necessary.</p> <p>Collaborative</p> <p>Monitor serial ABGs/pulse oximetry.</p> <p>Provide supplemental oxygen as appropriate.</p>	<p>Pulmonary TB can cause a wide range of effects in the lungs, ranging from a small patch of bronchopneumonia to diffuse intense inflammation, caseous necrosis, pleural effusion, and extensive fibrosis. Respiratory effects can range from mild dyspnea to profound respiratory distress. <i>Note:</i> Use of a scale to evaluate dyspnea helps clarify degree of difficulty and changes in condition.</p> <p>Accumulation of secretions/airway compromise can impair oxygenation of vital organs and tissues. (Refer to ND: Airway Clearance, ineffective.)</p> <p>Creates resistance against outflowing air to prevent collapse/narrowing of the airways, thereby helping distribute air throughout the lungs and relieve/reduce shortness of breath.</p> <p>Reducing oxygen consumption/demand during periods of respiratory compromise may reduce severity of symptoms.</p> <p>Decreased oxygen content (PaO₂) and/or saturation or increased PaCO₂ indicate need for intervention/change in therapeutic regimen.</p> <p>Aids in correcting the hypoxemia that may occur secondary to decreased ventilation/diminished alveolar lung surface.</p>

NURSING DIAGNOSIS: Nutrition: imbalanced, less than body requirements

May be related to

Fatigue
Frequent cough/sputum production; dyspnea
Anorexia
Insufficient financial resources

Possibly evidenced by

Weight 10%–20% below ideal for frame and height
Reported lack of interest in food, altered taste sensation
Poor muscle tone

DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:

Nutritional Status (NOC)

Demonstrate progressive weight gain toward goal with normalization of laboratory values and be free of signs of malnutrition.

Initiate behaviors/lifestyle changes to regain and/or to maintain appropriate weight.

ACTIONS/INTERVENTIONS	RATIONALE
Nutrition Management (NIC)	
Independent	
Document patient's nutritional status on admission, noting skin turgor, current weight and degree of weight loss, integrity of oral mucosa, ability/inability to swallow, presence of bowel tones, history of nausea/vomiting or diarrhea.	Useful in defining degree/extent of problem and appropriate choice of interventions.
Ascertain patient's usual dietary pattern, likes/dislikes.	Helpful in identifying specific needs/strengths. Consideration of individual preferences may improve dietary intake.
Monitor I&O and weight periodically.	Useful in measuring effectiveness of nutritional and fluid support.
Investigate anorexia and nausea/vomiting, and note possible correlation to medications. Monitor frequency, volume, consistency of stools.	May affect dietary choices and identify areas for problem solving to enhance intake/utilization of nutrients.
Encourage and provide for frequent rest periods.	Helps conserve energy, especially when metabolic requirements are increased by fever.
Provide oral care before and after respiratory treatments.	Reduces bad taste left from sputum or medications used for respiratory treatments that can stimulate the vomiting center.
Encourage small, frequent meals with foods high in protein and carbohydrates.	Maximizes nutrient intake without undue fatigue/energy expenditure from eating large meals, and reduces gastric irritation.
Encourage SO to bring foods from home and to share meals with patient unless contraindicated.	Creates a more normal social environment during mealtime, and helps meet personal, cultural preferences.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Nutrition Management (NIC)</p> <p>Collaborative</p> <p>Refer to dietitian for adjustments in dietary composition.</p> <p>Consult with respiratory therapy to schedule treatments 1–2 hr before/after meals.</p> <p>Monitor laboratory studies, e.g., BUN, serum protein, and prealbumin/albumin.</p> <p>Administer antipyretics as appropriate.</p>	<p>Provides assistance in planning a diet with nutrients adequate to meet patient’s metabolic requirements, dietary preferences, and financial resources post/discharge.</p> <p>May help reduce the incidence of nausea and vomiting associated with medications or the effects of respiratory treatments on a full stomach.</p> <p>Low values reflect malnutrition and indicate need for intervention/change in therapeutic regimen.</p> <p>Fever increases metabolic needs and therefore calorie consumption.</p>

<p>NURSING DIAGNOSIS: Knowledge, deficient [Learning Need] regarding condition, treatment, prevention, self-care, and discharge needs</p> <p>May be related to</p> <ul style="list-style-type: none"> Lack of exposure to/misinterpretation of information Cognitive limitations Inaccurate/incomplete information presented <p>Possibly evidenced by</p> <ul style="list-style-type: none"> Request for information Expressed misconceptions about health status Lack of or inaccurate follow-through of instructions/behaviors Expressing or exhibiting feelings of being overwhelmed <p>DESIRED OUTCOMES/EVALUATION CRITERIA—PATIENT WILL:</p> <p>Knowledge: Illness Care (NOC)</p> <ul style="list-style-type: none"> Verbalize understanding of disease process/prognosis and prevention. Initiate behaviors/lifestyle changes to improve general well-being and reduce risk of reactivation of TB. Identify symptoms requiring evaluation/intervention. Describe a plan for receiving adequate follow-up care. Verbalize understanding of therapeutic regimen and rationale for actions.

ACTIONS/INTERVENTIONS	RATIONALE
<p>Learning Facilitation (NIC)</p> <p>Independent</p> <p>Assess patient's ability to learn, e.g., level of fear, concern, fatigue, participation level; best environment in which patient can learn; how much content; best media and language; who should be included.</p> <p>Provide instruction and specific written information for patient to refer to, e.g., schedule for medications and follow-up sputum testing for documenting response to therapy.</p> <p>Encourage patient/SO to verbalize fears/concerns. Answer questions factually. Note prolonged use of denial.</p>	<p>Learning depends on emotional and physical readiness and is achieved at an individual pace.</p> <p>Written information relieves patient of the burden of having to remember large amounts of information. Repetition strengthens learning.</p> <p>Provides opportunity to correct misconceptions/alleviate anxiety. Inadequate finances/prolonged denial may affect coping with/managing the tasks necessary to regain/maintain health.</p>
<p>Teaching: Disease Process (NIC)</p> <p>Identify symptoms that should be reported to healthcare provider, e.g., hemoptysis, chest pain, fever, difficulty breathing, hearing loss, vertigo.</p> <p>Emphasize the importance of maintaining high-protein and carbohydrate diet and adequate fluid intake. (Refer to ND: Nutrition: imbalanced, less than body requirements.)</p> <p>Explain medication dosage, frequency of administration, expected action, and the reason for long treatment period. Review potential interactions with other drugs/substances.</p> <p>Review potential side effects of treatment (e.g., dryness of mouth, constipation, visual disturbances, headache, orthostatic hypertension) and problem-solve solutions.</p> <p>Stress need to abstain from alcohol while on INH.</p> <p>Refer for eye examination after starting and then monthly while taking ethambutol.</p> <p>Evaluate job-related risk factors, e.g., working in foundry/rock quarry, sandblasting.</p> <p>Encourage abstaining from smoking.</p>	<p>May indicate progression or reactivation of disease or side effects of medications, requiring further evaluation.</p> <p>Meeting metabolic needs helps minimize fatigue and promote recovery. Fluids aid in liquefying/expectorating secretions.</p> <p>Enhances cooperation with therapeutic regimen and may prevent patient from discontinuing medication before cure is truly effected. Directly observed therapy (DOT) is the treatment of choice when patient is unable or unwilling to take medications as prescribed.</p> <p>May prevent/reduce discomfort associated with therapy and enhance cooperation with regimen.</p> <p>Combination of INH and alcohol has been linked with increased incidence of hepatitis.</p> <p>Major side effect is reduced visual acuity; initial sign may be decreased ability to perceive green.</p> <p>Excessive exposure to silicone dust enhances risk of silicosis, which may negatively affect respiratory function/bronchitis.</p> <p>Although smoking does not stimulate recurrence of TB, it does increase the likelihood of respiratory dysfunction/bronchitis.</p>

ACTIONS/INTERVENTIONS	RATIONALE
<p>Teaching: Disease Process (NIC)</p> <p>Independent</p> <p>Review how TB is transmitted (e.g., primarily by inhalation of airborne organisms, but may also spread through stools or urine if infection is present in these systems) and hazards of reactivation.</p> <p>Refer to public health agency.</p>	<p>Knowledge may reduce risk of transmission/reactivation. Complications associated with reactivation include cavitation, abscess formation, destructive emphysema, spontaneous pneumothorax, diffuse interstitial fibrosis, serous effusion, empyema, bronchiectasis, hemoptysis, GI ulceration, bronchopleural fistula, tuberculous laryngitis, and miliary spread.</p> <p>DOT by community nurses is often the most effective way to ensure patient adherence to therapy. Monitoring can include pill counts and urine dipstick testing for presence of antitubercular drug. Patients with MDR-TB may be monitored with monthly sputum specimens for AFB smear and culture. <i>Note:</i> In some states, there are legal means for involuntary confinement for care if efforts to ensure patient adherence are ineffective.</p>

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

Therapeutic Regimen: ineffective management—complexity of therapeutic regimen, economic difficulties, family patterns of health care, perceived seriousness/benefits.

Infection, risk for (secondary)—decrease in ciliary action, stasis of body fluids, suppressed inflammatory response, tissue destruction, chronic disease, malnutrition, increased environmental exposure.

Fatigue—increased energy requirements to perform ADLs, discomfort.

Therapeutic Regimen: Families, ineffective management—complexity of therapeutic regimen, decisional conflicts, economic difficulties, family conflict.