

# To be or not TB: Role of Pharmacists in Detecting and Managing Latent Tuberculosis Infection (LTBI)

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## Learning Objectives

- Compare and contrast LTBI and active tuberculosis (TB) disease
- Explain the appropriate technique for purified protein derivatives (PPD) placement to interpret and identify LTBI
- Utilize the Centers for Disease Control (CDC) treatment guidelines for LTBI management
- Discuss how pharmacists contribute to the continuity of care in LTBI management

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## Outline

1. Epidemiology of Tuberculosis
2. Review of Tuberculosis Facts
3. Methods for Identifying LTBI and Distinguishing it from Active TB Disease
4. Treatment of LTBI according to CDC guidelines
5. The Role of Pharmacists in LTBI Management
6. Summary and Conclusion

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## Tuberculosis

- Estimated that up to 13 million people in the US live with latent TB (LTBI)
- 1 in 10 people with inactive TB will get sick with active TB disease without treatment
- "Think. Test. Treat TB"
  - Think: Am I at risk for TB infection?
  - Test: TB blood test, TB skin test
  - Treat: What are the treatment options?

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### REPORTED TB CASES AND TB RATES IN THE U.S., 2012-2022\*

TB DISEASE CASES INCREASED IN 2022, BUT DID NOT RETURN TO PRE-PANDEMIC LEVELS



\*Preliminary 2022 data  
Source: Centers for Disease Control and Prevention

"TB Is Still Here – New CDC Data Show U.S. Cases Increased Again in 2022." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 22 Mar. 2023, <https://www.cdc.gov/media/releases/2023/s0323-TB-increase.html>.

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## TB is still here – US Cases Increased Again in 2022

- TB disease cases increased in 2022 but did not return to pre-pandemic levels
  - Delayed or missed diagnoses of TB disease in 2020?
- CDC data shows rebound increased cases among some groups:
  - Children aged ≤ 4 years old
  - People who are incarcerated
  - People from some racial and ethnic groups
- Recent TB innovations:
  - Shorter treatment regimen
  - CDC recommended video-directly observed therapy (vDOT)

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# Tuberculosis Review

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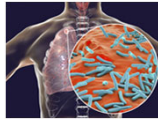
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## Tuberculosis (TB) Facts

- Caused by a bacterium called Mycobacterium tuberculosis
- Not everyone infected with TB bacteria becomes sick
- TB bacteria spread through the air from one person to another
- TB disease in the lungs or throat can be infectious. This means that the bacteria can spread to other people. TB in other parts of the body, such as the kidney or spine, is usually not infectious.
- People with TB disease are most likely to spread it to people they spend time with every day. This includes family members, friends, and coworkers or schoolmates
- TB is NOT spread by
  - shaking someone's hand
  - sharing food or drink
  - Touching bed linens or toilet seats
  - Sharing toothbrushes
  - Kissing



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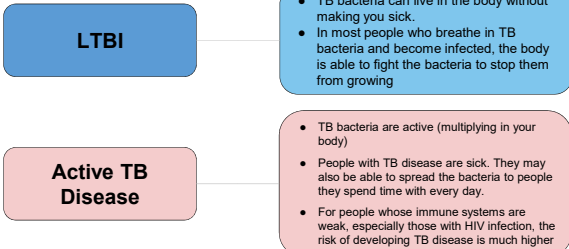
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## Latent TB vs. Active TB



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### Signs & Symptoms

**LTBI**

- Has no symptoms
- Does not feel sick
- Cannot spread TB bacteria to others
- Usually has a skin test or blood test result indicating TB infection
- Has a normal chest x-ray and a negative sputum smear
- Needs treatment for latent TB infection to prevent TB disease

**Active TB Disease**

- Bad cough that lasts 3 weeks or longer
- Pain in the chest, coughing up blood or sputum
- Weakness, fatigue, weight loss, no appetite
- Fever, chill, sweating at night
- May spread TB bacteria to others
- Usually has a skin test or blood test result indicating TB infection
- May have an abnormal chest x-ray, or positive sputum smear or culture
- Needs treatment to treat TB disease

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### Risk Factors for TB

Persons who have been recently infected with TB bacteria

- Close contacts of a person with infectious TB disease
- Persons who have immigrated from areas of the world with high rates of TB
- Children less than 5 years of age who have a positive TB test
- Groups with high rates of TB transmission, such as homeless persons, injection drug users, and persons with HIV infection
- Persons who work or reside with people who are at high risk for TB in facilities or institutions such as hospitals, homeless shelters, correctional facilities, nursing homes, and residential homes for those with HIV

Persons with medical conditions that weaken the immune system

- Babies and young children
- HIV infection
- Substance abuse
- Sarcoidosis
- Diabetes mellitus
- Severe kidney disease
- Low body weight
- Organ transplants
- Head and neck cancer
- Medical treatments such as corticosteroids or organ transplant
- Specialized treatment for rheumatoid arthritis or Crohn's disease

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## Screening for Tuberculosis

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## Purified Protein Derivative (PPD) Skin Test

- Also known as the tuberculin skin test (TST skin test) and Mantoux test
- Administered through the “Mantoux technique”
- A TB skin test requires two visits with a health care provider
  - On the first visit the test is placed; on the second visit the health care provider reads the test between 48-72 hours after administration
- The positivity of these tests does not distinguish between latent or active tuberculosis
  - Symptom assessment and further testing (chest radiograph, sputum test for acid-fast bacillus, CT scan) are essential to look for an active infection

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PPD Skin Test	IGRA
Tuberculin is injected under the skin and produces a <b>delayed-type hypersensitivity reaction</b> if the person has been infected with <i>M. tuberculosis</i>	<b>Blood</b> is drawn for testing; test measures the <b>immune response</b> to the TB bacteria in whole blood
Requires <b>two or more</b> patient visits to conduct the test	Requires one patient visit to conduct the test
Results are available <b>48 to 72 hours</b> later	Results can be available in 24 hours (depending on the batching of specimens by the laboratory and transport)
Can cause boosted reaction	Does <b>not</b> cause boosted reaction
Reading by health care worker may be subjective	Laboratory test not affected by health care worker perception or bias
<b>BCG</b> vaccination can cause <b>false-positive result</b>	<b>BCG</b> vaccination <b>does not</b> cause false-positive result and infection with most nontuberculous mycobacteria does not cause false-positive result
A negative reaction to the test does not exclude the diagnosis of LTBI or TB disease	A negative reaction to the test does not exclude the diagnosis of LTBI or TB disease

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## PPD Skin Test Administration

- 1 Locate and clean injection site**
  - 2 to 4 inches below elbow joint
    - Place forearm palm side up on a firm, well lit surface
    - Select an area free of barriers to placing and reading (e.g., scars, sores)
    - Clean the area with an alcohol swab
- 2 Prepare syringe**
  - Check expiration date on vial and ensure vial contains tuberculin (5 TU per 0.1 ml)
  - Use a single-dose tuberculin syringe with a 1/4- to 1/2-inch, 27-gauge needle with a short bevel
  - Fill the syringe with 0.1 ml of tuberculin
- 3 Inject tuberculin**
  - Insert slowly, bevel up, at a 5- to 15-degree angle
  - Needle bevel can be seen just below skin surface
  - After injection, a tense, pale wheal should appear over the needle

\*Mantoux Tuberculin Skin Test - Centers for Disease Control and Prevention. Centers for Disease Control and Prevention. Mantoux Tuberculin Skin Testing Protocol. [https://www.cdc.gov/tb/diseases/mantoux/pdf/Mantoux\\_TB\\_Skin\\_Test.pdf](https://www.cdc.gov/tb/diseases/mantoux/pdf/Mantoux_TB_Skin_Test.pdf)

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**4 Check skin test**




- Wheal should be 6 to 10 mm in diameter. If not, repeat test at a site at least 2 inches away from original site

**5 Record information**

- Record all information required for documentation by your institution (e.g., date and time of test administration, injection site location, lot number of tuberculin)

"Mantoux Tuberculin Skin Test - Centers for Disease Control and Prevention." Centers for Disease Control and Prevention. *Mantoux Tuberculin Skin Testing Products*. [https://www.cdc.gov/tb/education/mantoux/pdf/Mantoux\\_TB\\_Skin\\_Test.pdf](https://www.cdc.gov/tb/education/mantoux/pdf/Mantoux_TB_Skin_Test.pdf).

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### PPD Skin Test Reading

**1 Inspect site**

- Visually inspect site under good light
- Erythema (reddening of the skin) - do not measure
- Induration (hard, dense, raised formation)

**2 Palpate induration**

- Use fingertips to find margins of induration

**3 Mark induration**

- Use fingertip as a guide for marking widest edges of induration across forearm


**4 Measure induration (not erythema)**

- Place "0" ruler line inside left dot edge
- Read ruler line inside right dot edge (use lower measurement if between two graduations on mm scale)

**5 Record measurement of induration in mm**

- If no induration, record as 0 mm
- Do not record as "positive" or "negative"
- Only record measurement in millimeters (mm)

"Mantoux Tuberculin Skin Test - Centers for Disease Control and Prevention." Centers for Disease Control and Prevention. *Mantoux Tuberculin Skin Testing Products*. [https://www.cdc.gov/tb/education/mantoux/pdf/Mantoux\\_TB\\_Skin\\_Test.pdf](https://www.cdc.gov/tb/education/mantoux/pdf/Mantoux_TB_Skin_Test.pdf).

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### PPD Skin Test Interpretation

Induration of >5 mm is considered positive in	Induration of >10 mm is considered positive in	Induration of >15 mm is considered positive in
<ul style="list-style-type: none"> <li>People living with HIV</li> <li>Recent contacts of people with infectious TB disease</li> <li>People who have fibrotic changes on a chest radiograph</li> <li>Patients with organ transplants</li> <li>Other immunosuppressed patients</li> </ul>	<ul style="list-style-type: none"> <li>Born in countries TB disease is common (Mexico, Philippines, Vietnam, India, China, Haiti, Guatemala)</li> <li>Misuse drugs and alcohol</li> <li>Live or work in high-risk congregate settings (e.g., nursing homes, homeless shelters, or correctional facilities)</li> <li>Mycobacteriology laboratory workers</li> <li>People with certain medical conditions that place them at high risk for TB</li> <li>Children younger than 5 years of age</li> <li>Infants, children, and adolescents exposed to adults in high-risk categories</li> </ul>	<ul style="list-style-type: none"> <li>People with no known risk factors for TB</li> </ul>

"Mantoux Tuberculin Skin Test - Centers for Disease Control and Prevention." Centers for Disease Control and Prevention. *Mantoux Tuberculin Skin Testing Products*. [https://www.cdc.gov/tb/education/mantoux/pdf/Mantoux\\_TB\\_Skin\\_Test.pdf](https://www.cdc.gov/tb/education/mantoux/pdf/Mantoux_TB_Skin_Test.pdf).

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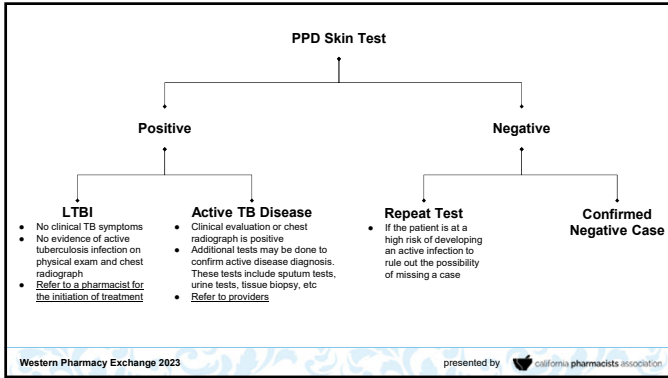
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## Treatment Options for LTBI

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### Preferred Treatment

Drug	Duration of Therapy	Doses & Age Group	Adverse Effects
Isoniazid + Rifapentine	Once weekly for 3 months  Total Doses=12	<b>Adults and children aged ≥ 12 years:</b> <b>INH:</b> 15mg/kg rounded up to the nearest 50 or 100mg (max: 900mg)  <b>RPT:</b> 10-14kg → 300mg 14.1-25kg → 450mg 25.1-32kg → 600mg 32.1-49.9kg → 750mg ≥50kg → 900mg max  <b>Children aged 2-11 years:</b> <b>INH:</b> 25mg/kg; (max: 900mg) <b>RPT:</b> same as adults	<b>Isoniazid</b> <ul style="list-style-type: none"> <li>N/V/GI upset</li> <li>Seizures</li> </ul> <b>Toxicities:</b> <ul style="list-style-type: none"> <li>Hepatitis (BBW)</li> <li>Peripheral Neuropathy → take w/ pyridoxine (Vit B6) 25-50 mg PO daily to decrease peripheral neuropathy</li> </ul> <b>Rifapentine*:</b> <ul style="list-style-type: none"> <li>Orange-red discoloration of bodily fluids</li> <li>Joint pain</li> </ul> *Not interchangeable with Rifampin

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### Preferred Treatment

Drug	Duration of Therapy	Doses & Age Group	Adverse Effects
Rifampin	Once Daily for 4 Months	Adults: 10mg/kg (max: 600mg)	<ul style="list-style-type: none"> <li>Orange-red discoloration of bodily fluids</li> <li>Many DDIs (CYP2C8/2C9/2C19/3A4 inducer)</li> </ul>
	Total Doses=120	Children: 15-20mg/kg (max: 600mg)	
Isoniazid + Rifampin	Once Daily for 3 Months	Adults: INH: 5mg/kg (max: 300mg) RIF: 10mg/kg (max: 600mg)	<b>Isoniazid</b> <ul style="list-style-type: none"> <li>NV/GI upset</li> <li>Seizures</li> </ul> <b>Rifampin</b> <ul style="list-style-type: none"> <li>Orange-red discoloration of bodily fluids</li> <li>Many DDIs (CYP2C8/2C9/2C19/3A4 inducer)</li> </ul>
	Total Doses=90	Children: INH: 10-20mg/kg (max: 300mg) RIF: 15-20mg/kg (max: 600mg)	

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### Alternative Treatment

Drug	Duration of Therapy	Doses & Age Group	Adverse Effects
Isoniazid	Once Daily for 6 months	Adults Daily: 5mg/kg; (max 300mg) Twice weekly: 15mg/kg; (max 900mg)	<b>Isoniazid</b> <ul style="list-style-type: none"> <li>NV/GI upset</li> <li>Seizures</li> </ul> <b>Toxicities:</b> <ul style="list-style-type: none"> <li>Hepatitis (BBW)</li> <li>Peripheral Neuropathy → take w/ pyridoxine (Vit B6) 25-50 mg PO daily to decrease peripheral neuropathy</li> </ul>
	Total Doses=180		
	Twice weekly for 6 months	Total Doses=52	
	Once Daily for 9 months	Children: Daily: 10-20mg/kg; (max 300mg) Twice weekly: 20-40mg/kg; (max 900mg)	
	Total Doses=270		
	Twice weekly for 9 months		
	Total Doses=76		

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Regimen	Duration	Guidelines Recommendation	Considerations/Notes:
Isoniazid + Rifampentine Once Weekly	3 months	Strongly recommended for adults and children aged > 2 y/o INCLUDING HIV(+)	<ul style="list-style-type: none"> <li><b>Preferred Treatment</b></li> <li>Cost of medications</li> <li>Pill burden</li> <li>Systemic drug reaction or influenza-like syndrome (syncope, hypotension)</li> </ul>
Rifampin Once Daily	4 months	Strongly recommended for HIV(-) adults and children of all ages	<ul style="list-style-type: none"> <li><b>Preferred Treatment</b></li> <li>DDIs with rifampin</li> <li>Can modify using rifabutin in situations where rifampin is contraindicated due to DDI and INH cannot be used</li> </ul>
Isoniazid + Rifampin Once Daily	3 months	Conditionally recommended for adults and children for all ages and HIV (+) as DDIs allow	<ul style="list-style-type: none"> <li><b>Preferred Treatment</b></li> <li>DDIs with rifampin</li> <li>Acquired drug resistance if TB is not adequately excluded</li> <li>Hepatotoxicity</li> </ul>
Isoniazid Once Daily	6 or 9 months	Strongly recommended for HIV(-) and children of all ages (only if unable to take preferred regimen) Conditionally recommended for HIV(+) adults and children	<ul style="list-style-type: none"> <li><b>Alternative treatment</b></li> <li>Long duration</li> <li>Hepatotoxicity</li> <li>Low treatment completion rates (due to long duration)</li> <li><b>Preferred treatment for pregnant patients</b></li> </ul>

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# Management of LTBI by Pharmacist

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## Referral Methods

- Electronic prescription is initiated and sent to a pharmacy with the note "Pharmacy to Follow"
- A direct message is sent to the pharmacy via Electronic Medical Records (EMR) portal
- Direct message sent to the pharmacy via HIPAA compliant communications platform
- A phone call or fax is made to the pharmacy

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## Initiation of Therapy

- The pharmacist will have a discussion with patients regarding appropriate treatment options
- Initiation of a clinically appropriate regimen will be based on the following considerations:
  - CDC recommendations for appropriate treatment options, including dosing and weight-based dosing of medications
  - FDA package inserts regarding the safety of treatment options, given the patient's medical history
  - Shared clinical decision-making with the patient in order to increase adherence rates and completion of therapy

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### Initial Consultation

- Confirm the patient's weight and other pertinent medical history
- Dispense the appropriate LTBI treatment regimen
- Provide patient consultation, including:
  - Name and description of the medication regimen
  - Directions for use and storage of medication
  - Duration of drug therapy, including LTBI progression and the importance of treatment compliance
  - Prescription refill information
  - Precautions and relevant warnings, including common severe side effects or adverse reactions, potential drug interactions, and what to do in case of a missed dose
  - Therapeutic contraindications and avoidance of common severe side effects or adverse reactions, known interactions

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### Patient Handout Example

**Medication Tracker: Rifampin** *150 mg by mouth once daily QDx3*  
*Vitamin B<sub>6</sub> (pyridoxine) 50 mg by mouth once daily for a total of 4 months (120 doses)*  
 Write down the date when you take your medication

Date:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Date:	<input type="checkbox"/>	<input type="checkbox"/>	<i>Rifampin may cause your urine, saliva, tears, or sweat to appear an orange-red color. This is a normal side effect and the color may fade over time.</i>				

**STOP** taking your medicine and **CALL** the pharmacy right away if you have any of the problems below:

• Loss appetite, or no appetite for food	• Rash or itching
• An upset stomach or stomach cramps	• Yellowing skin or eyes
• Nausea or vomiting	• Severe weakness or tiredness
• Cola-colored urine or light stools	• Fever
• Easy bruising or bleeding	• Headache or body aches
• Diarrhea	

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### Follow-up Consultation

- The follow-up consultation may be as frequently as once a week or as infrequently as once a month
- The pharmacist will order and interpret LFTs as necessary for patient assessment
- Refer to the primary care provider if results fall outside of normal limits or are concerning to the pharmacist
- Document each clinical encounter in the patient's Electronic Medical Record (EMR), which is shared with the referring clinician

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## Discharge from Program

Patients may be discharged from the program for any of the following reasons:

- Successful completion of LTBI treatment
- Patients who complete LTBI treatment will be provided with a Certificate of LTBI Treatment Completion.
- Adverse drug events or intolerance to therapy that indicate discontinuation of therapy for safety reasons
- Elevated liver function test (LFT) measurements:
  - Exceeding 3 times the normal limit with symptoms present
  - Exceeding 5 times the upper limit of normal in an asymptomatic individual
- Patient declines further follow-up

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## Barriers to Adherence in LTBI Treatment for Patients

Clinic-Related Barriers	Patient-Related Barriers	Treatment Barriers
<ul style="list-style-type: none"> <li>• Long waiting time for appointment and referrals</li> <li>• Long waiting time in provider's office</li> <li>• Inconvenient office hours</li> <li>• Complicated telephone system (not user friendly)</li> <li>• Cost</li> </ul>	<ul style="list-style-type: none"> <li>• Misinformation or confusion about certain issues, such as                             <ul style="list-style-type: none"> <li>○ The meaning of test results</li> <li>○ Differences between injections, vaccines, TST, and blood tests</li> <li>○ The words "positive" and "negative" as they relate to test results</li> <li>○ Modes of TB transmission and prevention</li> <li>○ Exposure vs. becoming infected</li> <li>○ Safety of family and friends around someone with LTBI</li> </ul> </li> <li>• Residential instability</li> <li>• Poor access to health care</li> </ul>	<ul style="list-style-type: none"> <li>• Complexity and duration of treatment</li> <li>• Medication side effects</li> <li>• Obtaining refills</li> <li>• Frequency of office visits</li> <li>• Cost, including insurance co-payment</li> </ul>

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## The Role of Pharmacists in Promoting Patient Adherence to LTBI Treatment

Clinic-Related Advantages	Patient-Related Advantages	Treatment Advantages
<ul style="list-style-type: none"> <li>• Same-day consultation and medication pick-up to reduce the time gap between prescription order and medication receipt</li> <li>• Appointments are offered in different formats for patient convenience, including in-person, telephone, and virtual face-to-face visits</li> <li>• Lower initial consultation fee</li> </ul>	<ul style="list-style-type: none"> <li>• Pharmacists can help patients better understand their condition and treatment options by providing comprehensive education and counseling</li> <li>• Pharmacies are conveniently located in close proximity to patients and are easily accessible. The proximity and accessibility of pharmacies can also reduce transportation barriers that patients may face</li> </ul>	<ul style="list-style-type: none"> <li>• Frequent follow-up appointments helps patients stay on track with their treatment plan and address any concerns or challenges they may be facing</li> <li>• Pharmacists can assist with any cost issues on-site. They can help troubleshoot insurance coverage, find alternative medications, and provide guidance on how to manage out-of-pocket expenses</li> <li>• Discharge documentation provides patients with proof of completion of treatment, including medication regimen, dosing, duration of therapy, and other important details.</li> </ul>

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## Managing LTBI in Community Pharmacy Settings



Accessible and convenient locations



Direct monitoring of potential toxicity and adverse reactions



Same day consultation and medication pickup

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## Patient Case

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**Subjective:**  
 HPI: WP is a 25-year-old female who visits the pharmacy with a referral from her primary care physician to initiate therapy for her recently diagnosed LTBI.  
 She reports no symptoms, no history of previous TB treatment, and is otherwise healthy.  
 The patient reports that she has difficulty remembering to take her medications and expresses a preference for a shorter duration of therapy.

**Objective:**  
 Allergies: No known drug allergies  
 Physical Exam:  
 • Vitals: HR 88, BP 126/84, RR 20, temp 99.0°F  
 • Height: 5'4.0"  
 • Weight: 63 kg

PMH: None  
 SH:  
 • Caffeine: denies  
 • Illicit drugs: denies  
 • ETOH: Drinks beer, wine, liquor socially  
 • Medical & prescription insurance through employer

Current Medications:  
 • Lo Loestrin Fe 1 tablet by mouth daily  
 • Ibuprofen 800mg TID pm menstrual pain

Laboratory Data:  
 • LFT: WNL  
 • Urine HCG: (-)

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### Current Drug Shortages

- On March 28th, 2023, ASHP Drug Shortage Bulletins released an update regarding the shortage of Priftin oral tablets, manufactured by Sanofi-Aventis, which contain 150 mg of rifapentine
- The reason for the shortage is not provided by Sanofi-Aventis. The current supply is insufficient for usual ordering, and the company has put the tablets on allocation

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### 1. What is the recommended regimen, include strength, duration of therapy, frequency?

**Answer:**  
 Take 2 capsules of rifampin 300mg by mouth once daily for 4 months  
 Rifampin is recommended to take on an empty stomach - either 1 hour before or 2 hours after a meal with a full glass of water

**Explanation:**

- Dosing calculation:
  - Adults: 10mg/kg, max 600mg
  - 10mg/kg x 63kg = 630mg → 600mg TDD

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**2. What adverse reactions/monitoring parameter should be considered for this therapy, and how can it be managed?**

- Common reactions
  - Nausea, vomiting, stomach discomfort, diarrhea, loss of appetite
  - Skin rash, itching
  - Decreased blood pressure
  - Reddish-orange or yellow or brown discoloration of body fluids (teeth, urine, sweat, sputum, tears) (expected and harmless)
  - Soft contact lenses can be permanently stained
  - Tiredness or weakness
  - Yellow eyes or skin, increased liver function tests
- Less common, severe reactions
  - Allergic reactions like skin rash, itching or hives, swelling of face, lips, or tongue
  - Dark urine, yellowing of the eyes or skin
  - Difficulty breathing
  - Fever, headache, dizziness/lightheadedness, musculoskeletal pain
  - Rash with fever or blisters with or without peeling skin, itching or swollen lymph nodes

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**3. Are there any potential drug interaction(s)? How would you address the interaction?**

**Answer:**

Rifampin is a CYP3A4 inducer, which may decrease the serum concentration of Lo Loestrin Fe and increase the risk of contraceptive failure.

Consider an alternative method of contraception (e.g. condom)

Consider a back-up method during coadministration with rifampin, and continue back-up contraception for 28 days after discontinuing Rifampin to ensure contraceptive reliability

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**Medications or Food Interactions with Rifampin**

- |                                    |                                |
|------------------------------------|--------------------------------|
| • Systemic Hormonal Contraceptives | • Antifungals, Anti-bacterials |
| • Anticonvulsants                  | • Anti-hypertensives           |
| • Anti-arrhythmic                  | • Benzodiazepines              |
| • Anti-HIV                         | • Corticosteroids              |
| • Hepatitis C Antiviral            | • Oral hypoglycemic agents     |
| • Anti-coagulants                  | • Immunosuppressive agents     |
| • Anti-estrogens                   | • Analgesics                   |
| • Anti-psychotics                  | • Antacids                     |

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## Questions?

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## Thank You

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April 28th, 2023

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